TM59 Certificate of Assessment

Plot 001 - 356 - West

Certificate Number: j7zlTMK-bRa1-Py3N-e-PtPi8LQM-zJVG

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.62	16.17	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.3	29.5	Pass
Bedroom3	Noise - 0.15 EA	10 l/s Extract Fan	1.17	28	Pass
Kitchen	-	-	1.04	N/A	Pass
Living	-	-	1.32	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.62	16.17	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.3	29.5	Pass
Bedroom3	Noise - 0.15 EA	10 l/s Extract Fan	1.17	28	Pass
Kitchen	-	-	1.04	N/A	Pass
Living	-	-	1.32	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 002 - 356 - West

Certificate Number: VSk7t9MKO8JWw3JAeoUEF4qgdkj

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.59	16.83	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.27	25.67	Pass
Bedroom3	Noise - 0.15 EA	-	1.07	28.5	Pass
Kitchen	-	-	0.98	N/A	Pass
Living	-	-	1.12	N/A	Pass

View Details Online

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The password to access this data is: **9027849**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.59	16.83	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.27	25.67	Pass
Bedroom3	Noise - 0.15 EA	-	1.07	28.5	Pass
Kitchen	-	-	0.98	N/A	Pass
Living	-	-	1.12	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 003 - 356 - West

Certificate Number: zGB-S-Ta9Ct-nbFCMzfyX-fWwsMRTfg0

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.61	17.33	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.28	28	Pass
Bedroom3	Noise - 0.15 EA	20 l/s Extract Fan	1.03	26.83	Pass
Kitchen	-	-	1	N/A	Pass
Living	-	-	1.16	N/A	Pass

View Details Online

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.61	17.33	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.28	28	Pass
Bedroom3	Noise - 0.15 EA	20 l/s Extract Fan	1.03	26.83	Pass
Kitchen	-	-	1	N/A	Pass
Living	-	-	1.16	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 004 - 356 - West

Certificate Number: 74eU-DWB2M6gWPT-L-WUkpFT-qs2WAgu-X-w

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.61	17.33	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.28	27.5	Pass
Bedroom3	Noise - 0.15 EA	10 l/s Extract Fan	1.1	27	Pass
Kitchen	-	-	1.02	N/A	Pass
Living	-	-	1.21	N/A	Pass

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The password to access this data is: **4035194**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.61	17.33	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.28	27.5	Pass
Bedroom3	Noise - 0.15 EA	10 l/s Extract Fan	1.1	27	Pass
Kitchen	-	-	1.02	N/A	Pass
Living	-	-	1.21	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 005 - 341 - West

Certificate Number: 87In7-6-z-cZb2hW6mqBMuM-Ns-0-a6Q4NwY

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	10 l/s Extract Fan	1.44	31.83	Pass
Bedroom2	Noise - 0.1 EA	10 l/s Extract Fan	0.75	29.33	Pass
Kitchen	-	-	0.98	N/A	Pass
Living	-	-	1.78	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

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Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	10 l/s Extract Fan	1.44	31.83	Pass
Bedroom2	Noise - 0.1 EA	10 l/s Extract Fan	0.75	29.33	Pass
Kitchen	-	-	0.98	N/A	Pass
Living	-	-	1.78	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 006 - 341 - West

Certificate Number: 7Bm6-sAyuyNcPKzJ3qKvfzM6xCA-j

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	10 l/s Extract Fan	1.35	30.17	Pass
Bedroom2	Noise - 0.1 EA	10 l/s Extract Fan	0.75	31.17	Pass
Kitchen	-	-	0.96	N/A	Pass
Living	-	-	1.74	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	10 l/s Extract Fan	1.35	30.17	Pass
Bedroom2	Noise - 0.1 EA	10 l/s Extract Fan	0.75	31.17	Pass
Kitchen	-	-	0.96	N/A	Pass
Living	-	-	1.74	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 007 - 474 - North

Certificate Number: Ww7121f40aE-y-ft6JSRTUBueYrD-iB-PN

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.6	28.67	Pass
Bedroom2	Noise - Closed Night	80 l/s Extract Fan - Window made triple opening casement	0.2	29.33	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.58	28.83	Pass
Bedroom4	Noise - Restricted Openability	30 l/s Extract Fan	0.66	28.17	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.6	28.67	Pass
Bedroom2	Noise - Closed Night	80 l/s Extract Fan - Window made triple opening casement	0.2	29.33	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.58	28.83	Pass
Bedroom4	Noise - Restricted Openability	30 l/s Extract Fan	0.66	28.17	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 008 - 474 - South

Certificate Number: 0osU-c1lXpzc96fwo-QlXGv-WaQby

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.54	30.17	Pass
Bedroom2	Noise - Restricted Openability	80 l/s Extract Fan - Window made triple opening casement	0.31	31.33	Pass
Bedroom3	Noise - Restricted Openability	50 l/s Extract Fan	0.62	28.67	Pass
Bedroom4	Noise - Closed Night	40 l/s Extract Fan	0.72	28	Pass
Kitchen	-	-	0.82	N/A	Pass
Living	-	-	1.04	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.54	30.17	Pass
Bedroom2	Noise - Restricted Openability	80 l/s Extract Fan - Window made triple opening casement	0.31	31.33	Pass
Bedroom3	Noise - Restricted Openability	50 l/s Extract Fan	0.62	28.67	Pass
Bedroom4	Noise - Closed Night	40 l/s Extract Fan	0.72	28	Pass
Kitchen	-	-	0.82	N/A	Pass
Living	-	-	1.04	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 009 - 474 - South

Certificate Number: ZlBitK8p-SGTe-BgGx-vAj-lunktH-glM

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	15 l/s Extract Fan	0.54	29.83	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.29	30.83	Pass
Bedroom3	Noise - Restricted Openability	-	0.63	23.67	Pass
Bedroom4	Noise - Restricted Openability	-	0.73	26.33	Pass
Kitchen	-	-	0.84	N/A	Pass
Living	-	-	1.02	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	15 l/s Extract Fan	0.54	29.83	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.29	30.83	Pass
Bedroom3	Noise - Restricted Openability	-	0.63	23.67	Pass
Bedroom4	Noise - Restricted Openability	-	0.73	26.33	Pass
Kitchen	-	-	0.84	N/A	Pass
Living	-	-	1.02	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 010 - 356 - North

Certificate Number: 1D-29li-y-OWgZMr3TwdmvCaCEui-d

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	35 l/s Extract Fan	0.52	30.33	Pass
Bedroom2	Noise - Closed Night	70 l/s Extract Fan	0.17	29.83	Pass
Bedroom3	Noise - Closed Night	30 l/s Extract Fan	0.58	31.33	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	0.53	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	35 l/s Extract Fan	0.52	30.33	Pass
Bedroom2	Noise - Closed Night	70 l/s Extract Fan	0.17	29.83	Pass
Bedroom3	Noise - Closed Night	30 l/s Extract Fan	0.58	31.33	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	0.53	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 011 - 356 - North

Certificate Number: xQXZM-mbKR-KXMn-OSr-E9x7F7a0XcJPV

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	20.33	Pass
Bedroom2	Noise - Closed Night	70 l/s Extract Fan	0.16	29	Pass
Bedroom3	Noise - Closed Night	30 l/s Extract Fan	0.53	28.83	Pass
Kitchen	-	-	1.01	N/A	Pass
Living	-	-	0.4	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	20.33	Pass
Bedroom2	Noise - Closed Night	70 l/s Extract Fan	0.16	29	Pass
Bedroom3	Noise - Closed Night	30 l/s Extract Fan	0.53	28.83	Pass
Kitchen	-	-	1.01	N/A	Pass
Living	-	-	0.4	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 012 - 356 - North

Certificate Number: 7g-X9zNYOE-xHremkWT-OyGOf-rKdQf4

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	20.33	Pass
Bedroom2	Noise - 0.1 EA	70 l/s Extract Fan	0.17	25	Pass
Bedroom3	Noise - 0.1 EA	25 l/s Extract Fan	0.53	24.83	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.42	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	20.33	Pass
Bedroom2	Noise - 0.1 EA	70 l/s Extract Fan	0.17	25	Pass
Bedroom3	Noise - 0.1 EA	25 l/s Extract Fan	0.53	24.83	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.42	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 013 - 356 - North

Certificate Number: syRtsCWnyKySn8i-HigcBGw2Dg9

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	20.83	Pass
Bedroom2	Noise - 0.1 EA	70 l/s Extract Fan	0.17	26.67	Pass
Bedroom3	Noise - 0.1 EA	25 l/s Extract Fan	0.56	25.5	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.46	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	20.83	Pass
Bedroom2	Noise - 0.1 EA	70 l/s Extract Fan	0.17	26.67	Pass
Bedroom3	Noise - 0.1 EA	25 l/s Extract Fan	0.56	25.5	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.46	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 014 - 474 - North

Certificate Number: Q9P0f7N-zrk-izAcY6-H-vmHu1W-sHti9c-h

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	22	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.21	29.67	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.57	29.17	Pass
Bedroom4	-	-	1.03	23.33	Pass
Kitchen	-	-	1.2	N/A	Pass
Living	-	-	0.84	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	22	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.21	29.67	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.57	29.17	Pass
Bedroom4	-	-	1.03	23.33	Pass
Kitchen	-	-	1.2	N/A	Pass
Living	-	-	0.84	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 015 - 474 - North

Certificate Number: eVWEDHY1oDFDk8oYjK4ZL-8z2ZOCTI

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	22	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.21	29.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.57	28.67	Pass
Bedroom4	-	-	1.01	23.33	Pass
Kitchen	-	-	1.21	N/A	Pass
Living	-	-	0.82	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

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Acoustic Requirements

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Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
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Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	22	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.21	29.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.57	28.67	Pass
Bedroom4	-	-	1.01	23.33	Pass
Kitchen	-	-	1.21	N/A	Pass
Living	-	-	0.82	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 016 - 474 - North

Certificate Number: xDSXfw6JrNiZ-h6iGV0voGi-4g28Gq

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	22	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.2	28.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.56	28.67	Pass
Bedroom4	-	-	0.68	22.33	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.78	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
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3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	22	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.2	28.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.56	28.67	Pass
Bedroom4	-	-	0.68	22.33	Pass
Kitchen	-	-	1.06	N/A	Pass
Living	-	-	0.78	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 017 - 474 - South

Certificate Number: 4aLvSC46Ur0-7-lu-479wYm0I-dkv

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	15.5	Pass
Bedroom2	-	-	0.22	27	Pass
Bedroom3	-	-	0.56	18.5	Pass
Bedroom4	-	-	0.53	16.67	Pass
Kitchen	-	-	0.55	N/A	Pass
Living	-	-	0.98	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	15.5	Pass
Bedroom2	-	-	0.22	27	Pass
Bedroom3	-	-	0.56	18.5	Pass
Bedroom4	-	-	0.53	16.67	Pass
Kitchen	-	-	0.55	N/A	Pass
Living	-	-	0.98	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 018 - 474 - South

Certificate Number: X5pJD-CEmlu9lXwDZ5Y-h0w20MY8D4

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	15.83	Pass
Bedroom2	-	-	0.23	28.33	Pass
Bedroom3	-	-	0.56	18.33	Pass
Bedroom4	-	-	0.71	17.83	Pass
Kitchen	-	-	0.74	N/A	Pass
Living	-	-	0.98	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	15.83	Pass
Bedroom2	-	-	0.23	28.33	Pass
Bedroom3	-	-	0.56	18.33	Pass
Bedroom4	-	-	0.71	17.83	Pass
Kitchen	-	-	0.74	N/A	Pass
Living	-	-	0.98	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 019 - 474 - South

Certificate Number: CfEX1-Z9Gsxg9-7ura5-i0Jh-F-B0n-ZjgqK

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	16	Pass
Bedroom2	-	-	0.23	28.17	Pass
Bedroom3	-	-	0.56	18.33	Pass
Bedroom4	-	-	0.71	17.83	Pass
Kitchen	-	-	0.78	N/A	Pass
Living	-	-	0.97	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	16	Pass
Bedroom2	-	-	0.23	28.17	Pass
Bedroom3	-	-	0.56	18.33	Pass
Bedroom4	-	-	0.71	17.83	Pass
Kitchen	-	-	0.78	N/A	Pass
Living	-	-	0.97	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 020 - 356 - South

Certificate Number: 4yrZ-xd-a48-hBrgAPdaMA-a9b583J-jtos

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	16.5	Pass
Bedroom2	-	-	0.19	23	Pass
Bedroom3	-	-	0.64	19.67	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	16.5	Pass
Bedroom2	-	-	0.19	23	Pass
Bedroom3	-	-	0.64	19.67	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 021 - 356 - South

Certificate Number: q4CrXdkU9-w-eGm-I7U3I-ehy5OFRn-dh-m

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	15.67	Pass
Bedroom2	-	-	0.19	23.33	Pass
Bedroom3	-	-	0.62	21	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	15.67	Pass
Bedroom2	-	-	0.19	23.33	Pass
Bedroom3	-	-	0.62	21	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 022 - 474 - South

Certificate Number: 8z8JtXHyR-o0lZHVps-2llmYZF8-a20

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	16.67	Pass
Bedroom2	Noise - Closed Night	Window made triple opening casement	0.21	23.5	Pass
Bedroom3	Noise - Closed Night	-	0.62	22.83	Pass
Bedroom4	Noise - Closed Night	-	0.74	22	Pass
Kitchen	-	-	0.76	N/A	Pass
Living	-	-	1.05	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	16.67	Pass
Bedroom2	Noise - Closed Night	Window made triple opening casement	0.21	23.5	Pass
Bedroom3	Noise - Closed Night	-	0.62	22.83	Pass
Bedroom4	Noise - Closed Night	-	0.74	22	Pass
Kitchen	-	-	0.76	N/A	Pass
Living	-	-	1.05	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 023 - 474 - South

Certificate Number: UcQiKhdX-8Y5CWw-rVgJqAmD7DUtafWf

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.54	28.5	Pass
Bedroom2	Noise - Restricted Openability	80 l/s Extract Fan - Window made triple opening casement	0.25	29.17	Pass
Bedroom3	Noise - Restricted Openability	50 l/s Extract Fan	0.63	28.67	Pass
Bedroom4	Noise - Restricted Openability	20 l/s Extract Fan	0.75	26.67	Pass
Kitchen	-	-	0.83	N/A	Pass
Living	-	-	1.01	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.54	28.5	Pass
Bedroom2	Noise - Restricted Openability	80 l/s Extract Fan - Window made triple opening casement	0.25	29.17	Pass
Bedroom3	Noise - Restricted Openability	50 l/s Extract Fan	0.63	28.67	Pass
Bedroom4	Noise - Restricted Openability	20 l/s Extract Fan	0.75	26.67	Pass
Kitchen	-	-	0.83	N/A	Pass
Living	-	-	1.01	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 024 - A01V2 - North

Certificate Number: KLr8p-b6i-Jh-GQGQwEe-j2JH-Uaq-P0XZVE

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	40 l/s Extract Fan	0.36	27.5	Pass
KitchenLiving	-	-	0.49	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	40 l/s Extract Fan	0.36	27.5	Pass
KitchenLiving	-	-	0.49	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 025 - A03V2 - North

Certificate Number: ASvUCmuz1t-rPdjLqn-AxWXOmJdZwC

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	50 l/s Extract Fan	0.52	28	Pass
KitchenLiving	-	-	0.81	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	50 l/s Extract Fan	0.52	28	Pass
KitchenLiving	-	-	0.81	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 026 - A02V2 - North

Certificate Number: Y6g4N1l09EaBWuk-g-bjRO-L-P1U6BT

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	25 l/s Extract Fan	0.17	29	Pass
Bedroom2	Security - Closed Night	25 l/s Extract Fan	0.24	29.17	Pass
KitchenLiving	-	-	0.51	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	25 l/s Extract Fan	0.17	29	Pass
Bedroom2	Security - Closed Night	25 l/s Extract Fan	0.24	29.17	Pass
KitchenLiving	-	-	0.51	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 027 - A04V2 - North

Certificate Number: 5laqSpz-Zq-v8PpdZf-dWTt-8jq2-0

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.56	28.5	Pass
KitchenLiving	-	-	1.38	N/A	Pass

View Details Online

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The password to access this data is: **6641425**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.56	28.5	Pass
KitchenLiving	-	-	1.38	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 028 - A05V2 - North

Certificate Number: jsgxJUv-p8V-Rzr2-9-eUZ-mkc2k8Zm0F

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	15 l/s Extract Fan	0.3	23.67	Pass
Bedroom2	Noise - 0.15 EA	15 l/s Extract Fan	0.34	23.5	Pass
KitchenLiving	-	-	0.69	N/A	Pass

View Details Online

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The password to access this data is: **4247932**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	15 l/s Extract Fan	0.3	23.67	Pass
Bedroom2	Noise - 0.15 EA	15 l/s Extract Fan	0.34	23.5	Pass
KitchenLiving	-	-	0.69	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 029 - A06V2 - North

Certificate Number: 93-W-ym6xjbpig-0jlZHLNK5hG-gzqOewK

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	30 l/s Extract Fan	0.63	25.83	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.66	25.83	Pass
KitchenLiving	-	-	1.47	N/A	Pass

View Details Online

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The password to access this data is: **7210609**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	30 l/s Extract Fan	0.63	25.83	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.66	25.83	Pass
KitchenLiving	-	-	1.47	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 030 - MAIV1 - North

Certificate Number: 3mxrsuqFWvVh0JZ-qBV-eU8-H-w2h-K

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	25 l/s Extract Fan	0.34	31.67	Pass
KitchenLiving	-	-	0.13	N/A	Pass

View Details Online

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The password to access this data is: **4984464**

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Scope and Exclusions

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All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	25 l/s Extract Fan	0.34	31.67	Pass
KitchenLiving	-	-	0.13	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 031 - MAIV1 - North

Certificate Number: fVkahHqaBTX-j613Ga72vPg1TV

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.26	11.83	Pass
Bedroom2	-	-	0.38	13.83	Pass
KitchenLiving	-	-	0.49	N/A	Pass

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The password to access this data is: **8159412**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.26	11.83	Pass
Bedroom2	-	-	0.38	13.83	Pass
KitchenLiving	-	-	0.49	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 032 - A01V1 - North

Certificate Number: rqO-7kEtQ-x-Wk-SXG-3-9ls-NTc4D2FOY

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	30 l/s Extract Fan	0.48	30	Pass
KitchenLiving	-	-	0.66	N/A	Pass

View Details Online

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The password to access this data is: **3801169**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	30 l/s Extract Fan	0.48	30	Pass
KitchenLiving	-	-	0.66	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 033 - A03V1 - North

Certificate Number: 2E-zxtT3-B-xmB-JjYblQSZcO2lzl6n

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	35 l/s Extract Fan	0.45	31.83	Pass
KitchenLiving	-	-	0.47	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **4578825**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	35 l/s Extract Fan	0.45	31.83	Pass
KitchenLiving	-	-	0.47	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 034 - A02V1 - North

Certificate Number: F9rDqR-QVvxH1rMOlH8w8tSsSDF

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	20 l/s Extract Fan	0.14	30.67	Pass
Bedroom2	Security - Closed Night	20 l/s Extract Fan	0.14	30	Pass
KitchenLiving	-	-	0.36	N/A	Pass

View Details Online

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The password to access this data is: **8556159**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	20 l/s Extract Fan	0.14	30.67	Pass
Bedroom2	Security - Closed Night	20 l/s Extract Fan	0.14	30	Pass
KitchenLiving	-	-	0.36	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 035 - A01V1 - North

Certificate Number: ITPAy1-znc3y-5j6yiAacRz-G6i-4qZ-5-V

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	11	Pass
KitchenLiving	-	-	1	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **3195456**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	11	Pass
KitchenLiving	-	-	1	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 036 - A04V1 - North

Certificate Number: CE-mqjUySD-L-4oMSj4R5RF-idsmyAY

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	11.33	Pass
Bedroom2	-	-	0.5	11.5	Pass
KitchenLiving	-	-	0.98	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **8076900**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	11.33	Pass
Bedroom2	-	-	0.5	11.5	Pass
KitchenLiving	-	-	0.98	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 037 - A02V1 - North

Certificate Number: MHgCXSyP-gOZpciyK-EA1A-s9-HW-x

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.23	14	Pass
Bedroom2	-	-	0.25	14	Pass
KitchenLiving	-	-	0.52	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.23	14	Pass
Bedroom2	-	-	0.25	14	Pass
KitchenLiving	-	-	0.52	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 038 - MAIV2 - East

Certificate Number: 7NVtzQmH-7H3fXHXt-js-7-6A5vJiyl

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	20 l/s Extract Fan	0.23	27.5	Pass
KitchenLiving	-	-	0.52	N/A	Pass

View Details Online

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The password to access this data is: **6832780**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	20 l/s Extract Fan	0.23	27.5	Pass
KitchenLiving	-	-	0.52	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 039 - MAIV2 - East

Certificate Number: Gxl-VTdJT-l-p-6itu-msUs-9Phml5a

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	8.67	Pass
Bedroom2	-	-	0.37	10.83	Pass
KitchenLiving	-	-	0.8	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	8.67	Pass
Bedroom2	-	-	0.37	10.83	Pass
KitchenLiving	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 040 - 236 - East

Certificate Number: MTqVH2DSdSYjkpI-lB5AH-T3SV-lN-l9

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.64	31.17	Pass
Bedroom2	Noise - 0.3 EA	-	0.61	29.83	Pass
Kitchen	-	-	0.67	N/A	Pass
Living	-	-	1.01	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.64	31.17	Pass
Bedroom2	Noise - 0.3 EA	-	0.61	29.83	Pass
Kitchen	-	-	0.67	N/A	Pass
Living	-	-	1.01	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 041 - 242 - South

Certificate Number: Wn-lfSV2JmjNAnlHn-oCXDh3gGJbWE2E

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	18	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.46	29.83	Pass
Kitchen	-	-	0.52	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.48	18	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.46	29.83	Pass
Kitchen	-	-	0.52	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 042 - 352 - South

Certificate Number: z18a-T8WLi2HeXBK9g1nj-FWQ-3Eg

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.46	19	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	0.46	28.67	Pass
Bedroom3	-	-	0.54	21.17	Pass
Kitchen	-	-	0.39	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.46	19	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	0.46	28.67	Pass
Bedroom3	-	-	0.54	21.17	Pass
Kitchen	-	-	0.39	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 043 - 352 - South

Certificate Number: 47yAXgIX-rWovkAaIC-Z-BAyaBK-7

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.46	19.5	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	0.45	28.33	Pass
Bedroom3	-	-	0.54	21.17	Pass
Kitchen	-	-	0.4	N/A	Pass
Living	-	-	0.8	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.46	19.5	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	0.45	28.33	Pass
Bedroom3	-	-	0.54	21.17	Pass
Kitchen	-	-	0.4	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 044 - 242 - South

Certificate Number: CGR7B-eMlFudR3-rNbOjEJ6fRQh-D5X

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	20.17	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.51	29.67	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.83	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	20.17	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.51	29.67	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.83	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 045 - 242 - South

Certificate Number: SC0S1J-TBR2Nzu1b-2C-6uz8sLR95

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	18.17	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.53	31.33	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.82	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	18.17	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.53	31.33	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.82	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 046 - 242 - South

Certificate Number: r2Ln-MWMeZrm0OHeYC4-mJj52-MdVC

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.47	19.67	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.46	28.67	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.82	N/A	Pass

View Details Online

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The password to access this data is: **4725668**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.47	19.67	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.46	28.67	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.82	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 047 - 236 - West

Certificate Number: X9L5NgyEeSHRZclBY-bKTbc-jLs6AlB

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	40 l/s Extract Fan	0.68	30.83	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.79	29.67	Pass
Kitchen	-	-	0.88	N/A	Pass
Living	-	-	1.08	N/A	Pass

View Details Online

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The password to access this data is: **2345297**

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Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

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The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	40 l/s Extract Fan	0.68	30.83	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.79	29.67	Pass
Kitchen	-	-	0.88	N/A	Pass
Living	-	-	1.08	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 048 - 352 - West

Certificate Number: 2OvSn-40PLp2PvmuE-f1-bw4B-mNYvEct

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.57	15.5	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.87	31.17	Pass
Bedroom3	-	-	0.66	18.17	Pass
Kitchen	-	-	0.89	N/A	Pass
Living	-	-	0.89	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.57	15.5	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.87	31.17	Pass
Bedroom3	-	-	0.66	18.17	Pass
Kitchen	-	-	0.89	N/A	Pass
Living	-	-	0.89	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 049 - 352 - West

Certificate Number: Zk-19Ca5wf-Abd-HfvQ4yla8lLpGZc-wN

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.57	14.83	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.85	29.33	Pass
Bedroom3	-	-	0.65	18	Pass
Kitchen	-	-	0.89	N/A	Pass
Living	-	-	0.97	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.57	14.83	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.85	29.33	Pass
Bedroom3	-	-	0.65	18	Pass
Kitchen	-	-	0.89	N/A	Pass
Living	-	-	0.97	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 050 - 241 - East

Certificate Number: UL8rzmX-bCdcFXn-yxYCDb6nbltwRmz-x

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.78	24.5	Pass
Bedroom2	Noise - 0.15 EA	15 l/s Extract Fan	0.58	29	Pass
Kitchen	-	-	1.86	N/A	Pass
Living	-	-	0.98	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.78	24.5	Pass
Bedroom2	Noise - 0.15 EA	15 l/s Extract Fan	0.58	29	Pass
Kitchen	-	-	1.86	N/A	Pass
Living	-	-	0.98	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 051 - 241 - East

Certificate Number: c6sJE-OGyVZz81-0AzZqPofcDT1d-ct

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.71	24.83	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.58	29.83	Pass
Kitchen	-	-	1.7	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.71	24.83	Pass
Bedroom2	Noise - 0.1 EA	30 l/s Extract Fan	0.58	29.83	Pass
Kitchen	-	-	1.7	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 052 - 241 - East

Certificate Number: Si-FU1ZqdQK6WKnHKhkAU-LMh9-NoLclj

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.72	22.5	Pass
Bedroom2	Noise - Closed Night	45 l/s Extract Fan	0.56	31.17	Pass
Kitchen	-	-	1.72	N/A	Pass
Living	-	-	0.92	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.72	22.5	Pass
Bedroom2	Noise - Closed Night	45 l/s Extract Fan	0.56	31.17	Pass
Kitchen	-	-	1.72	N/A	Pass
Living	-	-	0.92	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 053 - 241 - East

Certificate Number: FsRPTz-XN76-qhqyHl0ih1V-lqWTG7

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.72	22.67	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.55	31	Pass
Kitchen	-	-	1.67	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.72	22.67	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.55	31	Pass
Kitchen	-	-	1.67	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 054 - 341 - East

Certificate Number: FR3X5-gJN-7-VtWdhz-jMaRWsTD-e-9-Fw

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	-	0.67	23.33	Pass
Bedroom2	-	-	1.11	26.17	Pass
Kitchen	-	-	1.76	N/A	Pass
Living	-	-	1.04	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	-	0.67	23.33	Pass
Bedroom2	-	-	1.11	26.17	Pass
Kitchen	-	-	1.76	N/A	Pass
Living	-	-	1.04	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 055 - 341 - East

Certificate Number: CV-bQlgNdgtXyV2J3d-3zkwM-Yg-6Q4-lG

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	-	0.68	22.67	Pass
Bedroom2	-	-	1.11	25	Pass
Kitchen	-	-	1.52	N/A	Pass
Living	-	-	1	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	-	0.68	22.67	Pass
Bedroom2	-	-	1.11	25	Pass
Kitchen	-	-	1.52	N/A	Pass
Living	-	-	1	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 056 - 354 - East

Certificate Number: NhHeZdOz1-HYZ-t5vxyJ-YfEQu-IE

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.68	26.83	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	1.09	28.67	Pass
Bedroom3	Noise - 0.1 EA	15 l/s Extract Fan	0.86	30.17	Pass
Kitchen	-	-	1.37	N/A	Pass
Living	-	-	0.83	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.68	26.83	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	1.09	28.67	Pass
Bedroom3	Noise - 0.1 EA	15 l/s Extract Fan	0.86	30.17	Pass
Kitchen	-	-	1.37	N/A	Pass
Living	-	-	0.83	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 057 - 241 - North

Certificate Number: VJN-MYKwWE9q36PipWi-MsKGC6BCoa

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.41	24.67	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	0.42	31.83	Pass
Kitchen	-	-	0.81	N/A	Pass
Living	-	-	0.57	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.41	24.67	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	0.42	31.83	Pass
Kitchen	-	-	0.81	N/A	Pass
Living	-	-	0.57	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 058 - 341 - North

Certificate Number: 3WTaXIJ-2caCf-14EumOs9yziAP

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.61	29.67	Pass
Bedroom2	-	-	0.49	26.83	Pass
Kitchen	-	-	0.81	N/A	Pass
Living	-	-	0.64	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.61	29.67	Pass
Bedroom2	-	-	0.49	26.83	Pass
Kitchen	-	-	0.81	N/A	Pass
Living	-	-	0.64	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 059 - 341 - North

Certificate Number: Zh-jn-ul1vyT-i1RGEwSg8-W-9wkMm

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.62	30.33	Pass
Bedroom2	-	-	0.49	27	Pass
Kitchen	-	-	0.83	N/A	Pass
Living	-	-	0.67	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.62	30.33	Pass
Bedroom2	-	-	0.49	27	Pass
Kitchen	-	-	0.83	N/A	Pass
Living	-	-	0.67	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 060 - 341 - North

Certificate Number: 8wYebl8-bqzULJAopcEjXy-Kjvn-vi

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.65	31.33	Pass
Bedroom2	-	-	0.6	29	Pass
Kitchen	-	-	0.83	N/A	Pass
Living	-	-	0.67	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	0.65	31.33	Pass
Bedroom2	-	-	0.6	29	Pass
Kitchen	-	-	0.83	N/A	Pass
Living	-	-	0.67	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 061 - 354 - West

Certificate Number: kjt403m9Nn5-o-lwkerGbElmufS

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	20 l/s Extract Fan	1.08	28.67	Pass
Bedroom2	Noise - 0.1 EA	50 l/s Extract Fan	1.06	31.83	Pass
Bedroom3	Noise - 0.2 EA	15 l/s Extract Fan	0.74	31.33	Pass
Kitchen	-	-	1.34	N/A	Pass
Living	-	-	1.15	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	20 l/s Extract Fan	1.08	28.67	Pass
Bedroom2	Noise - 0.1 EA	50 l/s Extract Fan	1.06	31.83	Pass
Bedroom3	Noise - 0.2 EA	15 l/s Extract Fan	0.74	31.33	Pass
Kitchen	-	-	1.34	N/A	Pass
Living	-	-	1.15	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 066 - 352 - South

Certificate Number: sJ-da-9Ht-lQEMC-WMSi6pkRFJS-Hw

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	17.67	Pass
Bedroom2	-	-	0.44	17.33	Pass
Bedroom3	-	-	0.5	19	Pass
Kitchen	-	-	0.45	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	17.67	Pass
Bedroom2	-	-	0.44	17.33	Pass
Bedroom3	-	-	0.5	19	Pass
Kitchen	-	-	0.45	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 067 - 352 - South

Certificate Number: klXNqtAz1B2cY6BWrM0WzRpN84-LR

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.63	18.33	Pass
Bedroom2	-	-	0.72	16.83	Pass
Bedroom3	-	-	0.52	19.5	Pass
Kitchen	-	-	0.6	N/A	Pass
Living	-	-	1.03	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.63	18.33	Pass
Bedroom2	-	-	0.72	16.83	Pass
Bedroom3	-	-	0.52	19.5	Pass
Kitchen	-	-	0.6	N/A	Pass
Living	-	-	1.03	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 068 - 352 - South

Certificate Number: JZ74APrWlcv9QzDsD9b-h-SAVKH-xMa2

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.63	18.33	Pass
Bedroom2	-	-	0.71	16.83	Pass
Bedroom3	-	-	0.52	19.5	Pass
Kitchen	-	-	0.6	N/A	Pass
Living	-	-	1.02	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.63	18.33	Pass
Bedroom2	-	-	0.71	16.83	Pass
Bedroom3	-	-	0.52	19.5	Pass
Kitchen	-	-	0.6	N/A	Pass
Living	-	-	1.02	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 069 - 352 - South

Certificate Number: CkNV-L4-c4-z3gGSj8M-Tecb7pDyJM

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.45	17.83	Pass
Bedroom2	-	-	0.44	17.33	Pass
Bedroom3	-	-	0.49	19	Pass
Kitchen	-	-	0.44	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.45	17.83	Pass
Bedroom2	-	-	0.44	17.33	Pass
Bedroom3	-	-	0.49	19	Pass
Kitchen	-	-	0.44	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 070 - 354 - West

Certificate Number: GD9lD1HbabHzlWegVfRfwBx-sC-Mmax7

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	1.08	28.33	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.13	31.83	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.69	30.17	Pass
Kitchen	-	-	1.7	N/A	Pass
Living	-	-	1.2	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	1.08	28.33	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.13	31.83	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.69	30.17	Pass
Kitchen	-	-	1.7	N/A	Pass
Living	-	-	1.2	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 071 - 341 - North

Certificate Number: ldewpPq-2v-G1-U-t-wf-iUA-SPr-C-cz0laCO

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.66	31.67	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.62	31.17	Pass
Kitchen	-	-	0.86	N/A	Pass
Living	-	-	0.69	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.66	31.67	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.62	31.17	Pass
Kitchen	-	-	0.86	N/A	Pass
Living	-	-	0.69	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 072 - 361 - North

Certificate Number: 0i1OxgbtzhAO4-Wkioh-Bjy-3kpw8aNG

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.59	32	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	1.01	30	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.65	31.83	Pass
Kitchen	-	-	2.07	N/A	Pass
Living	-	-	0.8	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.59	32	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	1.01	30	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.65	31.83	Pass
Kitchen	-	-	2.07	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 073 - 361 - North

Certificate Number: tx9-TeVh2hc-WLGF-C-p-xtydG-0F-C4b1

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.59	31.33	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	1.02	30	Pass
Bedroom3	Noise - 0.1 EA	40 l/s Extract Fan	0.7	31.17	Pass
Kitchen	-	-	2.07	N/A	Pass
Living	-	-	0.78	N/A	Pass

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The password to access this data is: **6142747**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.59	31.33	Pass
Bedroom2	Noise - 0.1 EA	40 l/s Extract Fan	1.02	30	Pass
Bedroom3	Noise - 0.1 EA	40 l/s Extract Fan	0.7	31.17	Pass
Kitchen	-	-	2.07	N/A	Pass
Living	-	-	0.78	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 074 - 354 - East

Certificate Number: PKZp-t-quEGBl-mTtEDLZX-Z8JXcwEF-R

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	0.64	13.5	Pass
Bedroom2	Noise - 0.1 EA	-	1.09	13.33	Pass
Bedroom3	Noise - 0.1 EA	-	0.86	27.5	Pass
Kitchen	-	-	1.29	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

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It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	0.64	13.5	Pass
Bedroom2	Noise - 0.1 EA	-	1.09	13.33	Pass
Bedroom3	Noise - 0.1 EA	-	0.86	27.5	Pass
Kitchen	-	-	1.29	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 075 - 242 - East

Certificate Number: 3UC-wrd-gXVJQ185-WURB-st-9-xdbS

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	40 l/s Extract Fan	0.99	30	Pass
Bedroom2	-	-	0.62	15.5	Pass
Kitchen	-	-	2.03	N/A	Pass
Living	-	-	0.95	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	40 l/s Extract Fan	0.99	30	Pass
Bedroom2	-	-	0.62	15.5	Pass
Kitchen	-	-	2.03	N/A	Pass
Living	-	-	0.95	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 076 - 242 - East

Certificate Number: 8CxZrpRn4b5gU-wg-G-b-92jAvRvesFpsy

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.96	31.83	Pass
Bedroom2	-	-	0.62	23	Pass
Kitchen	-	-	1.99	N/A	Pass
Living	-	-	0.93	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.96	31.83	Pass
Bedroom2	-	-	0.62	23	Pass
Kitchen	-	-	1.99	N/A	Pass
Living	-	-	0.93	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 077 - 242 - East

Certificate Number: lLmU-arw-7MmK-v-bkfO-Qh7F-NZih4wn-ri

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	40 l/s Extract Fan	1	31	Pass
Bedroom2	-	-	0.62	21.33	Pass
Kitchen	-	-	1.88	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	40 l/s Extract Fan	1	31	Pass
Bedroom2	-	-	0.62	21.33	Pass
Kitchen	-	-	1.88	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 078 - 242 - East

Certificate Number: 05-BCaFyh-3c9U-39D95-Em2yD0dLt9E

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	1.06	31.33	Pass
Bedroom2	-	-	0.63	14.67	Pass
Kitchen	-	-	2	N/A	Pass
Living	-	-	0.99	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	20 l/s Extract Fan	1.06	31.33	Pass
Bedroom2	-	-	0.63	14.67	Pass
Kitchen	-	-	2	N/A	Pass
Living	-	-	0.99	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 079 - 242 - South

Certificate Number: o1hLAN-wNxi8XSeh-UVPmE-Lwo-lkN3VbZ

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	20 l/s Extract Fan	0.55	28	Pass
Bedroom2	-	-	0.45	18	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	0.77	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	20 l/s Extract Fan	0.55	28	Pass
Bedroom2	-	-	0.45	18	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	0.77	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 080 - 242 - South

Certificate Number: hAQa3XpgKkh-v-GVBkZ3eMNk9Lo

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	30 l/s Extract Fan	0.41	24.83	Pass
Bedroom2	Noise - 0.2 EA	30 l/s Extract Fan	0.48	28.5	Pass
Kitchen	-	-	0.47	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
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For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	30 l/s Extract Fan	0.41	24.83	Pass
Bedroom2	Noise - 0.2 EA	30 l/s Extract Fan	0.48	28.5	Pass
Kitchen	-	-	0.47	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 081 - 352 - South

Certificate Number: INexDzGP-u-o34-DESf-iRJzhz-TSeEBWk

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	50 l/s Extract Fan	0.42	28.83	Pass
Bedroom2	Noise - 0.2 EA	30 l/s Extract Fan	0.45	31	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.55	29.17	Pass
Kitchen	-	-	0.35	N/A	Pass
Living	-	-	0.78	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	50 l/s Extract Fan	0.42	28.83	Pass
Bedroom2	Noise - 0.2 EA	30 l/s Extract Fan	0.45	31	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.55	29.17	Pass
Kitchen	-	-	0.35	N/A	Pass
Living	-	-	0.78	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 082 - 352 - South

Certificate Number: fdfXOnDJ-mUGauToNq73U3ru50hTB

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.45	30	Pass
Bedroom2	Noise - 0.2 EA	30 l/s Extract Fan	0.47	32	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.57	29.33	Pass
Kitchen	-	-	0.36	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.45	30	Pass
Bedroom2	Noise - 0.2 EA	30 l/s Extract Fan	0.47	32	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.57	29.33	Pass
Kitchen	-	-	0.36	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 083 - 352 - South

Certificate Number: RKhbBT0i3-e-l9O-oH-caZAmejtmbrF

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.47	29.67	Pass
Bedroom2	Noise - 0.3 EA	30 l/s Extract Fan	0.46	28.83	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.57	29.17	Pass
Kitchen	-	-	0.37	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.47	29.67	Pass
Bedroom2	Noise - 0.3 EA	30 l/s Extract Fan	0.46	28.83	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.57	29.17	Pass
Kitchen	-	-	0.37	N/A	Pass
Living	-	-	0.79	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 084 - 352 - South

Certificate Number: 0a6qapZH-6-MclS1qH3qh-4S-cvTlF5h8

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.5	31.17	Pass
Bedroom2	Noise - 0.3 EA	30 l/s Extract Fan	0.47	29.67	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.58	29.67	Pass
Kitchen	-	-	0.41	N/A	Pass
Living	-	-	0.82	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.5	31.17	Pass
Bedroom2	Noise - 0.3 EA	30 l/s Extract Fan	0.47	29.67	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.58	29.67	Pass
Kitchen	-	-	0.41	N/A	Pass
Living	-	-	0.82	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 085 - 452 - South

Certificate Number: rovcm-J-tfm-u90G9fZyW2YQ1-vp-W0H

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	65 l/s Extract Fan	0.5	31.43	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	0.63	31.17	Pass
Bedroom3	Noise - Closed Night	60 l/s Extract Fan	0.58	29.67	Pass
Bedroom4	Noise - Closed Night	50 l/s Extract Fan	0.61	30	Pass
Kitchen	-	-	0.77	N/A	Pass
Living	-	-	0.85	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	65 l/s Extract Fan	0.5	31.43	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	0.63	31.17	Pass
Bedroom3	Noise - Closed Night	60 l/s Extract Fan	0.58	29.67	Pass
Bedroom4	Noise - Closed Night	50 l/s Extract Fan	0.61	30	Pass
Kitchen	-	-	0.77	N/A	Pass
Living	-	-	0.85	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 086 - 452 - South

Certificate Number: 9761Bg-wCbuC2qd-Hq-pJDoAUG0b48

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	65 l/s Extract Fan	0.5	31.53	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	0.62	31.17	Pass
Bedroom3	Noise - Closed Night	60 l/s Extract Fan	0.58	29.67	Pass
Bedroom4	Noise - Closed Night	50 l/s Extract Fan	0.61	30.33	Pass
Kitchen	-	-	0.77	N/A	Pass
Living	-	-	0.85	N/A	Pass

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The password to access this data is: **6786620**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	65 l/s Extract Fan	0.5	31.53	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	0.62	31.17	Pass
Bedroom3	Noise - Closed Night	60 l/s Extract Fan	0.58	29.67	Pass
Bedroom4	Noise - Closed Night	50 l/s Extract Fan	0.61	30.33	Pass
Kitchen	-	-	0.77	N/A	Pass
Living	-	-	0.85	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 087 - 364 - West

Certificate Number: AvmyVS4A89lGfQTs4n45tUPwt4

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	1.19	27.17	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.25	31.5	Pass
Bedroom3	-	-	0.81	23.67	Pass
Kitchen	-	-	1.23	N/A	Pass
Living	-	-	2.2	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	1.19	27.17	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.25	31.5	Pass
Bedroom3	-	-	0.81	23.67	Pass
Kitchen	-	-	1.23	N/A	Pass
Living	-	-	2.2	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 088 - 364 - West

Certificate Number: rwmr4-F1wJA5EG-T-6V-3bsS-s7YAPD1

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	1.14	26.83	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.2	29	Pass
Bedroom3	-	-	0.77	21.5	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	2.1	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	1.14	26.83	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.2	29	Pass
Bedroom3	-	-	0.77	21.5	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	2.1	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 097 - 452 - North

Certificate Number: 2C37-XD8t4nmaqx5rw8A-6iknsN-g

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.57	30	Pass
Bedroom2	-	10 l/s Extract Fan	0.61	29.83	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.63	30	Pass
Bedroom4	-	-	0.64	27.67	Pass
Kitchen	-	-	1.05	N/A	Pass
Living	-	-	0.57	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.57	30	Pass
Bedroom2	-	10 l/s Extract Fan	0.61	29.83	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.63	30	Pass
Bedroom4	-	-	0.64	27.67	Pass
Kitchen	-	-	1.05	N/A	Pass
Living	-	-	0.57	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 098 - 352 - North

Certificate Number: qI-G-XKryu7jPUNp1zZ6Pnl1n-625a-K

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	21	Pass
Bedroom2	Noise - Closed Night	35 l/s Extract Fan	0.53	31.67	Pass
Bedroom3	-	-	0.74	23.33	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	0.46	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	21	Pass
Bedroom2	Noise - Closed Night	35 l/s Extract Fan	0.53	31.67	Pass
Bedroom3	-	-	0.74	23.33	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	0.46	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 099 - 352 - North

Certificate Number: MyD8-cpwfW-eg-x6-rQxbzsB4k-mV-t2LdCM

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	21.17	Pass
Bedroom2	Noise - Closed Night	35 l/s Extract Fan	0.53	31.33	Pass
Bedroom3	-	-	0.74	23.17	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	0.46	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	21.17	Pass
Bedroom2	Noise - Closed Night	35 l/s Extract Fan	0.53	31.33	Pass
Bedroom3	-	-	0.74	23.17	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	0.46	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 100 - 236 - North

Certificate Number: dvlG704GHZKiacMIlY1F0mkD8-P

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	40 l/s Extract Fan	0.61	28.67	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.41	27.5	Pass
Kitchen	-	-	1.16	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	40 l/s Extract Fan	0.61	28.67	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.41	27.5	Pass
Kitchen	-	-	1.16	N/A	Pass
Living	-	-	0.91	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 101 - 242 - East

Certificate Number: puxg7LkraE-h2e-KtgbTWXAxO-8w7U

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	35 l/s Extract Fan	0.9	30	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.64	29.83	Pass
Kitchen	-	-	1.49	N/A	Pass
Living	-	-	1	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	35 l/s Extract Fan	0.9	30	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.64	29.83	Pass
Kitchen	-	-	1.49	N/A	Pass
Living	-	-	1	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 115 - 341 - West

Certificate Number: 2gOCP-BsXx-2-iP-odQcWtD-nX-jNnfasHev

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.23	28.33	Pass
Bedroom2	-	-	0.71	19.17	Pass
Kitchen	-	-	0.96	N/A	Pass
Living	-	-	1.65	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.23	28.33	Pass
Bedroom2	-	-	0.71	19.17	Pass
Kitchen	-	-	0.96	N/A	Pass
Living	-	-	1.65	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 116 - 241 - West

Certificate Number: GS-WF8-G85uzuLoPpBHgROY-tHv9TRM

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.61	19.5	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.75	31.17	Pass
Kitchen	-	-	0.94	N/A	Pass
Living	-	-	1.25	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.61	19.5	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.75	31.17	Pass
Kitchen	-	-	0.94	N/A	Pass
Living	-	-	1.25	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 117 - 341 - East

Certificate Number: yqmyGA7-0q-4fSke-bc-r4B6TzL-Gn3Ah-NU

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.29	28.67	Pass
Bedroom2	-	-	0.67	17	Pass
Kitchen	-	-	0.98	N/A	Pass
Living	-	-	1.49	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.29	28.67	Pass
Bedroom2	-	-	0.67	17	Pass
Kitchen	-	-	0.98	N/A	Pass
Living	-	-	1.49	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 122 - 361 - West

Certificate Number: 5HxFzKGWlphG-5xYjPi-3LRX09fj

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	35 l/s Extract Fan	0.97	31.17	Pass
Bedroom2	-	-	0.79	16.5	Pass
Bedroom3	-	-	0.8	16.67	Pass
Kitchen	-	-	1.75	N/A	Pass
Living	-	-	1.8	N/A	Pass

View Details Online

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The password to access this data is: **1497164**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	35 l/s Extract Fan	0.97	31.17	Pass
Bedroom2	-	-	0.79	16.5	Pass
Bedroom3	-	-	0.8	16.67	Pass
Kitchen	-	-	1.75	N/A	Pass
Living	-	-	1.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 123 - 361 - West

Certificate Number: qmHgRrX-J-hF9z-iyU7lMJXkSH-AfbRO-F

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	35 l/s Extract Fan	1.27	30.83	Pass
Bedroom2	-	-	0.8	16.5	Pass
Bedroom3	-	-	0.96	17	Pass
Kitchen	-	-	1.97	N/A	Pass
Living	-	-	2.28	N/A	Pass

View Details Online

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The password to access this data is: **7891024**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	35 l/s Extract Fan	1.27	30.83	Pass
Bedroom2	-	-	0.8	16.5	Pass
Bedroom3	-	-	0.96	17	Pass
Kitchen	-	-	1.97	N/A	Pass
Living	-	-	2.28	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 124 - 361 - West

Certificate Number: WrtCAF-6xfE-0ScKqtXy1gJDY1i

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	1.03	31.5	Pass
Bedroom2	-	-	1.04	16.83	Pass
Bedroom3	-	-	0.85	16.83	Pass
Kitchen	-	-	1.74	N/A	Pass
Living	-	-	1.8	N/A	Pass

View Details Online

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Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	1.03	31.5	Pass
Bedroom2	-	-	1.04	16.83	Pass
Bedroom3	-	-	0.85	16.83	Pass
Kitchen	-	-	1.74	N/A	Pass
Living	-	-	1.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 125 - 474 - North

Certificate Number: ngMQr-3-YqkWlGu3s0zwC7WH9su-dmG

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.62	30.33	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.21	29.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.58	31.5	Pass
Bedroom4	Noise - Restricted Openability	30 l/s Extract Fan	1.01	29.33	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	0.83	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.62	30.33	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.21	29.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.58	31.5	Pass
Bedroom4	Noise - Restricted Openability	30 l/s Extract Fan	1.01	29.33	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	0.83	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 126 - 474 - North

Certificate Number: gds1vlBMbT1ab0gF-jFehGg7cRMSY

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	17.5	Pass
Bedroom2	-	Window made triple opening casement	0.17	18.67	Pass
Bedroom3	-	-	0.51	15.5	Pass
Bedroom4	-	-	0.94	18.83	Pass
Kitchen	-	-	1.28	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	17.5	Pass
Bedroom2	-	Window made triple opening casement	0.17	18.67	Pass
Bedroom3	-	-	0.51	15.5	Pass
Bedroom4	-	-	0.94	18.83	Pass
Kitchen	-	-	1.28	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 134 - B01V1 - South

Certificate Number: Aa3cEV-7CFWS5JL-tse1gGZ91ti9-DA

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	35 l/s Extract Fan	0.36	30	Pass
Bedroom2	Noise - Closed Night	35 l/s Extract Fan	0.37	30.83	Pass
KitchenLiving	-	-	1.3	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	35 l/s Extract Fan	0.36	30	Pass
Bedroom2	Noise - Closed Night	35 l/s Extract Fan	0.37	30.83	Pass
KitchenLiving	-	-	1.3	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 135 - B01V2 - South

Certificate Number: 3Zh5-u-h-q-03CSfX-lmx-M581qOWmFv4Q

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.24	31.67	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.29	31.23	Pass
KitchenLiving	-	-	0.99	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

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All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.24	31.67	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.29	31.23	Pass
KitchenLiving	-	-	0.99	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 136 - B01V1 - South

Certificate Number: PA-KPGI13J5NprwB-eyNuifSD4MKU8W

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.31	27	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.32	26.83	Pass
KitchenLiving	-	-	1.15	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.31	27	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.32	26.83	Pass
KitchenLiving	-	-	1.15	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 137 - B01V2 - South

Certificate Number: L7KiZwrVNvl7RlO6f3J6dY-CH8ydwh

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.19	25.33	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.21	26.17	Pass
KitchenLiving	-	-	0.94	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.19	25.33	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.21	26.17	Pass
KitchenLiving	-	-	0.94	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 138 - B01V1 - South

Certificate Number: 5X6ARZe8f-q-3idQ7-D-C0qn-hJxuL

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.46	26.83	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.5	27.33	Pass
KitchenLiving	-	-	1.99	N/A	Pass

View Details Online

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The password to access this data is: **5681337**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.46	26.83	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.5	27.33	Pass
KitchenLiving	-	-	1.99	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 139 - B01V2 - South

Certificate Number: pyf5KXz-YCX-LkTEHpO-jqztU027m

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.52	25.83	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.55	26.17	Pass
KitchenLiving	-	-	1.7	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.52	25.83	Pass
Bedroom2	Noise - Closed Night	30 l/s Extract Fan	0.55	26.17	Pass
KitchenLiving	-	-	1.7	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 140 - 352 - North

Certificate Number: lj-O-GzQzpJMmlKUKvFSXto9Br-t6lQt

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	15.83	Pass
Bedroom2	-	-	0.46	14.67	Pass
Bedroom3	-	-	0.72	18.83	Pass
Kitchen	-	-	1.12	N/A	Pass
Living	-	-	0.44	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.5	15.83	Pass
Bedroom2	-	-	0.46	14.67	Pass
Bedroom3	-	-	0.72	18.83	Pass
Kitchen	-	-	1.12	N/A	Pass
Living	-	-	0.44	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 141 - 352 - North

Certificate Number: VfGJd-u-MprLnE-4tpa-xwjhamPWnCo

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	15.5	Pass
Bedroom2	-	-	0.44	14.17	Pass
Bedroom3	-	-	0.71	18.5	Pass
Kitchen	-	-	1.5	N/A	Pass
Living	-	-	0.67	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	15.5	Pass
Bedroom2	-	-	0.44	14.17	Pass
Bedroom3	-	-	0.71	18.5	Pass
Kitchen	-	-	1.5	N/A	Pass
Living	-	-	0.67	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 142 - 352 - North

Certificate Number: QOvqTx-n-8DFtUueHz-jlJ-0Bi-hpmZP8

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.51	16.5	Pass
Bedroom2	-	-	0.47	14.83	Pass
Bedroom3	-	-	0.72	19.17	Pass
Kitchen	-	-	1.53	N/A	Pass
Living	-	-	0.48	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.51	16.5	Pass
Bedroom2	-	-	0.47	14.83	Pass
Bedroom3	-	-	0.72	19.17	Pass
Kitchen	-	-	1.53	N/A	Pass
Living	-	-	0.48	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 143 - 354 - North

Certificate Number: 8bd-LtLgdV6NkhNTHo-SaqNviZW

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.65	23.67	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.54	30.67	Pass
Bedroom3	Noise - Restricted Openability	40 l/s Extract Fan	0.95	31	Pass
Kitchen	-	-	1.54	N/A	Pass
Living	-	-	0.86	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.65	23.67	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.54	30.67	Pass
Bedroom3	Noise - Restricted Openability	40 l/s Extract Fan	0.95	31	Pass
Kitchen	-	-	1.54	N/A	Pass
Living	-	-	0.86	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 144 - 474 - East

Certificate Number: 3qQ-ARH8A-4dHNJ9hJZgXQrO-obI3-o

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.93	22	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.21	28.67	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.69	30	Pass
Bedroom4	-	-	1.1	22.83	Pass
Kitchen	-	-	1.75	N/A	Pass
Living	-	-	1.19	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.93	22	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.21	28.67	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.69	30	Pass
Bedroom4	-	-	1.1	22.83	Pass
Kitchen	-	-	1.75	N/A	Pass
Living	-	-	1.19	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 145 - 474 - East

Certificate Number: CXlguJCQ5tbpbRb1w-GAegObI-x

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.93	22.33	Pass
Bedroom2	Noise - Closed Night	80 l/s Extract Fan - Window made triple opening casement	0.22	31.5	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.7	28.17	Pass
Bedroom4	-	-	1.43	25.67	Pass
Kitchen	-	-	2.24	N/A	Pass
Living	-	-	1.22	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.93	22.33	Pass
Bedroom2	Noise - Closed Night	80 l/s Extract Fan - Window made triple opening casement	0.22	31.5	Pass
Bedroom3	Noise - Closed Night	40 l/s Extract Fan	0.7	28.17	Pass
Bedroom4	-	-	1.43	25.67	Pass
Kitchen	-	-	2.24	N/A	Pass
Living	-	-	1.22	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 146 - 474 - East

Certificate Number: QemvbO7RN-iY-dAClMfK9N-diOnJf-x

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.95	23.17	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.22	29.17	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.72	26.83	Pass
Bedroom4	-	-	1.44	25.33	Pass
Kitchen	-	-	2.35	N/A	Pass
Living	-	-	1.28	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.95	23.17	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.22	29.17	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.72	26.83	Pass
Bedroom4	-	-	1.44	25.33	Pass
Kitchen	-	-	2.35	N/A	Pass
Living	-	-	1.28	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 147 - 474 - East

Certificate Number: A4AlDgbjTPQ0G4A-9v-f-bAlnGv-E

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.95	23	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.21	28	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.7	26.5	Pass
Bedroom4	Noise - Restricted Openability	20 l/s Extract Fan	1.42	29.33	Pass
Kitchen	-	-	2.29	N/A	Pass
Living	-	-	1.27	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.95	23	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.21	28	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.7	26.5	Pass
Bedroom4	Noise - Restricted Openability	20 l/s Extract Fan	1.42	29.33	Pass
Kitchen	-	-	2.29	N/A	Pass
Living	-	-	1.27	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 148 - 474 - East

Certificate Number: MiLrBCcglz-V-0JV-t8-5aE3Gw0qk-g9F

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.94	29.83	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.22	30.5	Pass
Bedroom3	Noise - Closed Night	60 l/s Extract Fan	0.73	28.33	Pass
Bedroom4	Noise - Closed Night	40 l/s Extract Fan	1.41	30.83	Pass
Kitchen	-	-	2.29	N/A	Pass
Living	-	-	1.31	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.94	29.83	Pass
Bedroom2	Noise - Closed Night	90 l/s Extract Fan - Window made triple opening casement	0.22	30.5	Pass
Bedroom3	Noise - Closed Night	60 l/s Extract Fan	0.73	28.33	Pass
Bedroom4	Noise - Closed Night	40 l/s Extract Fan	1.41	30.83	Pass
Kitchen	-	-	2.29	N/A	Pass
Living	-	-	1.31	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 149 - C01V1 - North

Certificate Number: VjJLubY1-LiCszd4-7ur-6HYVtZFd9Y-k

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	40 l/s Extract Fan	0.42	29.33	Pass
KitchenLiving	-	-	0.5	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	40 l/s Extract Fan	0.42	29.33	Pass
KitchenLiving	-	-	0.5	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 150 - C03V1 - North

Certificate Number: e6jv3BPW36loS-w9-xgZh7H60DrDl-zV

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	50 l/s Extract Fan	0.53	28.17	Pass
KitchenLiving	-	-	0.96	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **3321668**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	50 l/s Extract Fan	0.53	28.17	Pass
KitchenLiving	-	-	0.96	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 151 - C02 - North

Certificate Number: pHAcJ56-xrhzasq4pbehmbDngH7LW

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	30 l/s Extract Fan	0.09	29	Pass
KitchenLiving	-	-	0.19	N/A	Pass

View Details Online

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The password to access this data is: **2738664**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	30 l/s Extract Fan	0.09	29	Pass
KitchenLiving	-	-	0.19	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 152 - C01V2 - North

Certificate Number: ag89wl8nPd-MWtV6rC-Hp-BaR-kBl0

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	50 l/s Extract Fan	0.39	31.17	Pass
KitchenLiving	-	-	0.73	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **1669041**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	50 l/s Extract Fan	0.39	31.17	Pass
KitchenLiving	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 153 - C03V2 - North

Certificate Number: flqrqhPoEqUE-qFSJVPjyNmKJ-SE

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	55 l/s Extract Fan	0.51	31	Pass
KitchenLiving	-	-	0.79	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **2538205**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

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All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Security - Closed Night	55 l/s Extract Fan	0.51	31	Pass
KitchenLiving	-	-	0.79	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 154 - C01V1 - North

Certificate Number: i2V4PO0aLs2FRoH-TJoPD-n-K-YZ-Q9m9v

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	0.26	29	Pass
KitchenLiving	-	-	0.4	N/A	Pass

View Details Online

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The password to access this data is: **7810181**

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Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	0.26	29	Pass
KitchenLiving	-	-	0.4	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 155 - C06V1 - North

Certificate Number: DyeW-feU-JOSPs-JNx8-jONKx9-8Y-i

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.37	14.33	Pass
Bedroom2	-	-	0.38	14.5	Pass
KitchenLiving	-	-	1.01	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.37	14.33	Pass
Bedroom2	-	-	0.38	14.5	Pass
KitchenLiving	-	-	1.01	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 156 - C04 - North

Certificate Number: nUO-JZy-xjcv64-hGvoI-BO3-4-l0wP

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.39	26.67	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.3	26	Pass
KitchenLiving	-	-	0.43	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.39	26.67	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.3	26	Pass
KitchenLiving	-	-	0.43	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 157 - C05 - North

Certificate Number: 3W4YWF-fZus6J1N-6w-XHWVgDxLZ

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.39	25.83	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.3	26	Pass
KitchenLiving	-	-	0.19	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **2850813**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.39	25.83	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.3	26	Pass
KitchenLiving	-	-	0.19	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 158 - C01V2 - North

Certificate Number: 13iG-WVd-qlLPbEkTVSgjgl-U1mB

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.37	31.67	Pass
KitchenLiving	-	-	0.64	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **2300649**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.37	31.67	Pass
KitchenLiving	-	-	0.64	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 159 - C06V2 - North

Certificate Number: Eg-Qe9W4f8EK-3nm-0H-9-5Wcf-vS-HVCp

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	55 l/s Extract Fan	0.48	30.5	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.49	31.5	Pass
KitchenLiving	-	-	0.79	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **7214002**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	55 l/s Extract Fan	0.48	30.5	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.49	31.5	Pass
KitchenLiving	-	-	0.79	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 160 - C01V1 - North

Certificate Number: f49MXWLDj8kijK4Z9-nU-2Gy0OVb3Pu

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.68	26.17	Pass
KitchenLiving	-	-	0.78	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	40 l/s Extract Fan	0.68	26.17	Pass
KitchenLiving	-	-	0.78	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 161 - C06V1 - North

Certificate Number: FzJ-P76qxYy8V5BU9a-D-uzjSfmY-E

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.72	21	Pass
Bedroom2	-	-	0.74	21.17	Pass
KitchenLiving	-	-	1.68	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.72	21	Pass
Bedroom2	-	-	0.74	21.17	Pass
KitchenLiving	-	-	1.68	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 162 - C07 - North

Certificate Number: Hu2-coTwug8rsUDvj2tkjnhpl-VvBkY

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.43	32	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.48	31.67	Pass
KitchenLiving	-	-	0.89	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.43	32	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.48	31.67	Pass
KitchenLiving	-	-	0.89	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 163 - C05 - North

Certificate Number: GoUeJAY9w6TZuqVq1D2nS-8DX-O5N-3Rb

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	0.43	25.67	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.4	28.33	Pass
KitchenLiving	-	-	0.46	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	0.43	25.67	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.4	28.33	Pass
KitchenLiving	-	-	0.46	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 164 - C01V2 - North

Certificate Number: alfE-X-g7nqWf-PX-z-RXoy43-Pvyh3Vp-b0-x

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	55 l/s Extract Fan	0.58	29.67	Pass
KitchenLiving	-	-	1	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	55 l/s Extract Fan	0.58	29.67	Pass
KitchenLiving	-	-	1	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 165 - C06V2 - North

Certificate Number: l0-chbQca-f-T-NlB-Rk-mjhgN-l4p7mP

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.75	30.83	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.78	30.83	Pass
KitchenLiving	-	-	1.38	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.75	30.83	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.78	30.83	Pass
KitchenLiving	-	-	1.38	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 166 - 452 - East

Certificate Number: hqJQT-21WF-Diac7K4J-8H-2H1Ri-n2R-Zvx

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.7	31.33	Pass
Bedroom2	-	10 l/s Extract Fan	0.86	30.83	Pass
Bedroom3	Noise - Closed Night	55 l/s Extract Fan	0.76	30.67	Pass
Bedroom4	-	-	0.93	28.33	Pass
Kitchen	-	-	1.74	N/A	Pass
Living	-	-	1.2	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.7	31.33	Pass
Bedroom2	-	10 l/s Extract Fan	0.86	30.83	Pass
Bedroom3	Noise - Closed Night	55 l/s Extract Fan	0.76	30.67	Pass
Bedroom4	-	-	0.93	28.33	Pass
Kitchen	-	-	1.74	N/A	Pass
Living	-	-	1.2	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 167 - 452 - East

Certificate Number: rpbr-eO16Bf1zDXe0ED-tEtlFpZO

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.73	32	Pass
Bedroom2	-	30 l/s Extract Fan	0.85	26.83	Pass
Bedroom3	Noise - Closed Night	55 l/s Extract Fan	0.75	30.17	Pass
Bedroom4	-	-	0.93	28.17	Pass
Kitchen	-	-	1.76	N/A	Pass
Living	-	-	1.21	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.73	32	Pass
Bedroom2	-	30 l/s Extract Fan	0.85	26.83	Pass
Bedroom3	Noise - Closed Night	55 l/s Extract Fan	0.75	30.17	Pass
Bedroom4	-	-	0.93	28.17	Pass
Kitchen	-	-	1.76	N/A	Pass
Living	-	-	1.21	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 168 - 355 - South

Certificate Number: 1zgEsD1umCbEWiL-kq-gSN-2d-wuPH

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	-	1.04	27.17	Pass
Bedroom2	Noise - 0.15 EA	10 l/s Extract Fan	0.6	27.83	Pass
Bedroom3	-	-	0.56	13.5	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	1.6	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	-	1.04	27.17	Pass
Bedroom2	Noise - 0.15 EA	10 l/s Extract Fan	0.6	27.83	Pass
Bedroom3	-	-	0.56	13.5	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	1.6	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 169 - 361 - South

Certificate Number: msV-DzCzgMbW1DTMY-LgPJP8hg-RDukNM

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	30 l/s Extract Fan	0.52	31	Pass
Bedroom2	-	-	0.59	18	Pass
Bedroom3	-	-	0.61	18.33	Pass
Kitchen	-	-	0.97	N/A	Pass
Living	-	-	0.84	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	30 l/s Extract Fan	0.52	31	Pass
Bedroom2	-	-	0.59	18	Pass
Bedroom3	-	-	0.61	18.33	Pass
Kitchen	-	-	0.97	N/A	Pass
Living	-	-	0.84	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 170 - 361 - South

Certificate Number: MAFlz-TZYWedC8C-v5F0SD5q-E-m5tn-YU

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	35 l/s Extract Fan	0.54	31.67	Pass
Bedroom2	-	-	0.6	18.5	Pass
Bedroom3	-	-	0.63	19.17	Pass
Kitchen	-	-	1.02	N/A	Pass
Living	-	-	0.84	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.1 EA	35 l/s Extract Fan	0.54	31.67	Pass
Bedroom2	-	-	0.6	18.5	Pass
Bedroom3	-	-	0.63	19.17	Pass
Kitchen	-	-	1.02	N/A	Pass
Living	-	-	0.84	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 173 - 361 - West

Certificate Number: k39zFa6XvugRtuhrFaCIca-08e

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.2 EA	20 l/s Extract Fan	1.09	30.5	Pass
Bedroom2	-	-	0.96	16	Pass
Bedroom3	-	-	0.75	16	Pass
Kitchen	-	-	1.43	N/A	Pass
Living	-	-	1.81	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.2 EA	20 l/s Extract Fan	1.09	30.5	Pass
Bedroom2	-	-	0.96	16	Pass
Bedroom3	-	-	0.75	16	Pass
Kitchen	-	-	1.43	N/A	Pass
Living	-	-	1.81	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 174 - 361 - West

Certificate Number: TGl7x-bXUl8RsLoi-fG1Yp-z-0DUfORx

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.2 EA	20 l/s Extract Fan	1.12	31.67	Pass
Bedroom2	-	-	0.97	16.17	Pass
Bedroom3	-	-	0.78	16.67	Pass
Kitchen	-	-	1.46	N/A	Pass
Living	-	-	1.94	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.2 EA	20 l/s Extract Fan	1.12	31.67	Pass
Bedroom2	-	-	0.97	16.17	Pass
Bedroom3	-	-	0.78	16.67	Pass
Kitchen	-	-	1.46	N/A	Pass
Living	-	-	1.94	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 175 - 467 - West

Certificate Number: OGyF-qeo3fVRmjtMt-Gpd3KkReH

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.2 EA	-	0.97	16.83	Pass
Bedroom2	Noise - 0.2 EA	40 l/s Extract Fan	1.75	29.5	Pass
Bedroom3	Noise - 0.15 EA	30 l/s Extract Fan	0.74	30.5	Pass
Bedroom4	Noise - 0.15 EA	30 l/s Extract Fan	0.77	24.5	Pass
Dining	-	All casements made openable	2.92	N/A	Pass
Kitchen	-	-	0.93	N/A	Pass
Living	-	-	1.96	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.2 EA	-	0.97	16.83	Pass
Bedroom2	Noise - 0.2 EA	40 l/s Extract Fan	1.75	29.5	Pass
Bedroom3	Noise - 0.15 EA	30 l/s Extract Fan	0.74	30.5	Pass
Bedroom4	Noise - 0.15 EA	30 l/s Extract Fan	0.77	24.5	Pass
Dining	-	All casements made openable	2.92	N/A	Pass
Kitchen	-	-	0.93	N/A	Pass
Living	-	-	1.96	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 182 - 591 - South

Certificate Number: EDLniW-ki-N-msLWBq0mO-vN8JX8-qb

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	20 l/s Extract Fan	0.67	29.5	Pass
Bedroom2	Noise - 0.15 EA	20 l/s Extract Fan	0.69	28.17	Pass
Bedroom3	Noise - 0.15 EA	20 l/s Extract Fan	0.66	28.5	Pass
Bedroom4	Noise - 0.15 EA	50 l/s Extract Fan	0.78	29.83	Pass
Bedroom5	-	-	0.6	23	Pass
KitchenLiving	-	-	1.37	N/A	Pass
Living	-	-	1.57	N/A	Pass

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The password to access this data is: **6650150**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

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Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	20 l/s Extract Fan	0.67	29.5	Pass
Bedroom2	Noise - 0.15 EA	20 l/s Extract Fan	0.69	28.17	Pass
Bedroom3	Noise - 0.15 EA	20 l/s Extract Fan	0.66	28.5	Pass
Bedroom4	Noise - 0.15 EA	50 l/s Extract Fan	0.78	29.83	Pass
Bedroom5	-	-	0.6	23	Pass
KitchenLiving	-	-	1.37	N/A	Pass
Living	-	-	1.57	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 183 - 356 - South

Certificate Number: 8h-X-iYxoOTL-DZNSFdrcjw6LHJLruUP

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	16.67	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.21	28.17	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.64	29.5	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	16.67	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.21	28.17	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.64	29.5	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 184 - 356 - South

Certificate Number: XzjKF-xPEq0sZaCx-RP-iZHlKs-NfujJ

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	16.83	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.21	28	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.64	29.5	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.44	16.83	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.21	28	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.64	29.5	Pass
Kitchen	-	-	0.54	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 185 - 474 - South

Certificate Number: ABQJiACbyFkv2-MT7-JpK-c-ur-H-3-D5-m

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	18.17	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.22	30.33	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.64	30	Pass
Bedroom4	-	-	0.76	19.83	Pass
Kitchen	-	-	0.84	N/A	Pass
Living	-	-	1.03	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	18.17	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.22	30.33	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.64	30	Pass
Bedroom4	-	-	0.76	19.83	Pass
Kitchen	-	-	0.84	N/A	Pass
Living	-	-	1.03	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 186 - 474 - South

Certificate Number: qUTtQVoKv-E-arlrK-JC-Sbc-iRSLa

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	17.83	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.22	29.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.62	30	Pass
Bedroom4	-	-	0.76	19.83	Pass
Kitchen	-	-	0.82	N/A	Pass
Living	-	-	1	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.52	17.83	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.22	29.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.62	30	Pass
Bedroom4	-	-	0.76	19.83	Pass
Kitchen	-	-	0.82	N/A	Pass
Living	-	-	1	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 187 - 356 - South

Certificate Number: 5PkiUl4GZJI-S7C-zYfxjQtuUzD

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.42	16.67	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.2	28.17	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.64	29.5	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

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All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
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Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.42	16.67	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.2	28.17	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.64	29.5	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 188 - 356 - South

Certificate Number: 2mlueDuTpCPwN-0zH2R6l2Qq7XRY

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	16.83	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.21	27.67	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.62	29.33	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.43	16.83	Pass
Bedroom2	Noise - 0.15 EA	70 l/s Extract Fan	0.21	27.67	Pass
Bedroom3	Noise - 0.15 EA	25 l/s Extract Fan	0.62	29.33	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 189 - 591 - South

Certificate Number: ridS-MkCpn-pwfeFTks-M9Vrqn-LbpxE

Assessor Name: Ali Kahraman

Date of Assessment: 9th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	20 l/s Extract Fan	0.78	31.33	Pass
Bedroom2	Noise - 0.15 EA	20 l/s Extract Fan	0.69	28.33	Pass
Bedroom3	Noise - 0.15 EA	20 l/s Extract Fan	0.65	28.83	Pass
Bedroom4	Noise - 0.15 EA	50 l/s Extract Fan	0.75	29.5	Pass
Bedroom5	-	-	0.6	22	Pass
KitchenLiving	-	-	1.18	N/A	Pass
Living	-	-	1.48	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

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The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - 0.15 EA	20 l/s Extract Fan	0.78	31.33	Pass
Bedroom2	Noise - 0.15 EA	20 l/s Extract Fan	0.69	28.33	Pass
Bedroom3	Noise - 0.15 EA	20 l/s Extract Fan	0.65	28.83	Pass
Bedroom4	Noise - 0.15 EA	50 l/s Extract Fan	0.75	29.5	Pass
Bedroom5	-	-	0.6	22	Pass
KitchenLiving	-	-	1.18	N/A	Pass
Living	-	-	1.48	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	09/06/2026

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TM59 Certificate of Assessment

Plot 196 - 356 - South

Certificate Number: hEfp3ZeyAHwx7-JwZlzb-l-pVs-j-7V

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	15.5	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.23	27.67	Pass
Bedroom3	Noise - Restricted Openability	10 l/s Extract Fan	0.84	28.83	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	15.5	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.23	27.67	Pass
Bedroom3	Noise - Restricted Openability	10 l/s Extract Fan	0.84	28.83	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 197 - 356 - South

Certificate Number: YZmxeKS-Jawsdr-V2qbrF-m-R1fl8gj1-nb

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.39	14.67	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.2	27	Pass
Bedroom3	Noise - Restricted Openability	25 l/s Extract Fan	0.79	27.33	Pass
Kitchen	-	-	0.49	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.39	14.67	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.2	27	Pass
Bedroom3	Noise - Restricted Openability	25 l/s Extract Fan	0.79	27.33	Pass
Kitchen	-	-	0.49	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 198 - 356 - Southwest

Certificate Number: QHk-dL1Nu-OFzl-qXqlB-HU8BUy7A-JO-N

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	14.83	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.28	30.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.93	26.5	Pass
Kitchen	-	-	0.62	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	14.83	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.28	30.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.93	26.5	Pass
Kitchen	-	-	0.62	N/A	Pass
Living	-	-	0.8	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 199 - 356 - Southwest

Certificate Number: ASAn-YrcTp4JnV-pAxVQjxe9h17qPB-2

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	14.67	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.27	29.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.89	25.83	Pass
Kitchen	-	-	0.59	N/A	Pass
Living	-	-	0.75	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	14.67	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.27	29.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.89	25.83	Pass
Kitchen	-	-	0.59	N/A	Pass
Living	-	-	0.75	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 200 - 474 - Southwest

Certificate Number: LN-tYLlQepXmitpFdhwS-jumjBCR

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.51	15.33	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.41	31.17	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.92	27.33	Pass
Bedroom4	-	-	0.77	17.5	Pass
Kitchen	-	-	0.89	N/A	Pass
Living	-	-	1.71	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
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1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
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Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.51	15.33	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.41	31.17	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.92	27.33	Pass
Bedroom4	-	-	0.77	17.5	Pass
Kitchen	-	-	0.89	N/A	Pass
Living	-	-	1.71	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 201 - 474 - Southwest

Certificate Number: gDnoXzDXz3M0-n8pu-5UtgtNz2c

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	14.83	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.37	29.5	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.89	26.33	Pass
Bedroom4	-	-	0.76	17.17	Pass
Kitchen	-	-	0.84	N/A	Pass
Living	-	-	1.63	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

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Acoustic Requirements

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Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
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In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
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For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

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To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	14.83	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.37	29.5	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.89	26.33	Pass
Bedroom4	-	-	0.76	17.17	Pass
Kitchen	-	-	0.84	N/A	Pass
Living	-	-	1.63	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 202 - 474 - Southwest

Certificate Number: cIG-SYz-lB-YiLtbGNQ-JAHfQEJyN1

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	15.17	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.4	30.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.9	26.83	Pass
Bedroom4	-	-	0.77	17.5	Pass
Kitchen	-	-	0.87	N/A	Pass
Living	-	-	1.64	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
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3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	15.17	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.4	30.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.9	26.83	Pass
Bedroom4	-	-	0.77	17.5	Pass
Kitchen	-	-	0.87	N/A	Pass
Living	-	-	1.64	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 203 - 474 - Southwest

Certificate Number: er0k2nf6qaEGz-eqTQctLe-iYL8K-GP

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	15	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.38	29.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.89	26.33	Pass
Bedroom4	-	-	0.77	17.17	Pass
Kitchen	-	-	0.87	N/A	Pass
Living	-	-	1.64	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.49	15	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.38	29.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.89	26.33	Pass
Bedroom4	-	-	0.77	17.17	Pass
Kitchen	-	-	0.87	N/A	Pass
Living	-	-	1.64	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 204 - 356 - Southwest

Certificate Number: 5tXbuoemT-rTEg5frZqG3oEC-Fbg

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	14.83	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.28	30.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.93	27	Pass
Kitchen	-	-	0.62	N/A	Pass
Living	-	-	0.84	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.4	14.83	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.28	30.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.93	27	Pass
Kitchen	-	-	0.62	N/A	Pass
Living	-	-	0.84	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 205 - 356 - Southwest

Certificate Number: 8OA40mTh-mFgmKag1KmlylP-03noca2U

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.39	14.5	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.24	28.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.85	24.67	Pass
Kitchen	-	-	0.56	N/A	Pass
Living	-	-	0.7	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.39	14.5	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.24	28.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.85	24.67	Pass
Kitchen	-	-	0.56	N/A	Pass
Living	-	-	0.7	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 206 - 356 - Southwest

Certificate Number: al9-Rh7RFu2fOP19pnbu-qew-BY0FuO-p

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.39	14.83	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.27	30.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.85	26.67	Pass
Kitchen	-	-	0.57	N/A	Pass
Living	-	-	0.77	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.39	14.83	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.27	30.5	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.85	26.67	Pass
Kitchen	-	-	0.57	N/A	Pass
Living	-	-	0.77	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 207 - 356 - Southwest

Certificate Number: TsHU2lut0-I-4-Y-7dXZ-JtZAHyM3rd

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.38	14.5	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.25	29.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.83	26	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.38	14.5	Pass
Bedroom2	Noise - Restricted Openability	60 l/s Extract Fan	0.25	29.33	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.83	26	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.73	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 208 - 356 - South

Certificate Number: oOd-xuEgACkrx-H6kloCwElHTB-DcV

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.41	15.33	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.23	28.83	Pass
Bedroom3	Noise - Restricted Openability	25 l/s Extract Fan	0.8	28.33	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.76	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.41	15.33	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.23	28.83	Pass
Bedroom3	Noise - Restricted Openability	25 l/s Extract Fan	0.8	28.33	Pass
Kitchen	-	-	0.51	N/A	Pass
Living	-	-	0.76	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 209 - 356 - South

Certificate Number: zyh-ap3CgE-jv4-ojMtU8S-quxC-q0Z7NU

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.41	15	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.22	28	Pass
Bedroom3	Noise - Restricted Openability	25 l/s Extract Fan	0.8	28.17	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.75	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.41	15	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan	0.22	28	Pass
Bedroom3	Noise - Restricted Openability	25 l/s Extract Fan	0.8	28.17	Pass
Kitchen	-	-	0.53	N/A	Pass
Living	-	-	0.75	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 210 - 474 - South

Certificate Number: P1sGA-tj7U8RUnhxyAO7-9-rD86ixA

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.51	16.17	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.32	30.83	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.76	29.5	Pass
Bedroom4	-	-	0.6	17.67	Pass
Kitchen	-	-	0.6	N/A	Pass
Living	-	-	1.25	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.51	16.17	Pass
Bedroom2	Noise - Restricted Openability	70 l/s Extract Fan - Window made triple opening casement	0.32	30.83	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.76	29.5	Pass
Bedroom4	-	-	0.6	17.67	Pass
Kitchen	-	-	0.6	N/A	Pass
Living	-	-	1.25	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 218 - 467 - East

Certificate Number: dv-w1OS-Ajsrt3JiyrCA9XFc2j8-2U

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.69	21.5	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	0.92	24.83	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.68	29.5	Pass
Bedroom4	-	10 l/s Extract Fan	1.06	31.83	Pass
Dining	-	-	1.32	N/A	Pass
Kitchen	-	-	1.59	N/A	Pass
Living	-	-	2.28	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.69	21.5	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	0.92	24.83	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.68	29.5	Pass
Bedroom4	-	10 l/s Extract Fan	1.06	31.83	Pass
Dining	-	-	1.32	N/A	Pass
Kitchen	-	-	1.59	N/A	Pass
Living	-	-	2.28	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 219 - 472 - East

Certificate Number: DUS-eXBOc1qcy-7KosNj210-xG8-N-9

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	0.7	28.33	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.84	27.83	Pass
Bedroom3	-	-	0.79	28.33	Pass
Bedroom4	-	-	0.94	24.17	Pass
KitchenLiving	-	-	2.09	N/A	Pass
Living	-	-	1.33	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	30 l/s Extract Fan	0.7	28.33	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	0.84	27.83	Pass
Bedroom3	-	-	0.79	28.33	Pass
Bedroom4	-	-	0.94	24.17	Pass
KitchenLiving	-	-	2.09	N/A	Pass
Living	-	-	1.33	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 220 - 352 - East

Certificate Number: 56c56oJZOWkhw13m9B5NRStwdMCDV

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.58	21	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.68	31.17	Pass
Bedroom3	-	-	0.9	24.83	Pass
Kitchen	-	-	1.37	N/A	Pass
Living	-	-	1.07	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
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Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.68	31.17	Pass
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Kitchen	-	-	1.37	N/A	Pass
Living	-	-	1.07	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 221 - 352 - East

Certificate Number: yAOwd-ULIK-0yf3Hjh65YuQ-HwYVB1iv

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.62	21.67	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.69	31.67	Pass
Bedroom3	-	-	0.9	25.33	Pass
Kitchen	-	-	1.43	N/A	Pass
Living	-	-	1.11	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.62	21.67	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.69	31.67	Pass
Bedroom3	-	-	0.9	25.33	Pass
Kitchen	-	-	1.43	N/A	Pass
Living	-	-	1.11	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 222 - 352 - East

Certificate Number: dE7lbxH-R-mLTd84s-4D3Wwdsk-MaL

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.64	21.33	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.68	28	Pass
Bedroom3	-	-	0.9	25.83	Pass
Kitchen	-	-	1.37	N/A	Pass
Living	-	-	1.07	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.64	21.33	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.68	28	Pass
Bedroom3	-	-	0.9	25.83	Pass
Kitchen	-	-	1.37	N/A	Pass
Living	-	-	1.07	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 223 - 352 - East

Certificate Number: AYA-1I-Ed98LxsDQitKa-OvW9tFT1iRQD

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.64	21.5	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.68	27.33	Pass
Bedroom3	-	-	0.9	25.5	Pass
Kitchen	-	-	1.34	N/A	Pass
Living	-	-	1.06	N/A	Pass

View Details Online

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.64	21.5	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.68	27.33	Pass
Bedroom3	-	-	0.9	25.5	Pass
Kitchen	-	-	1.34	N/A	Pass
Living	-	-	1.06	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 224 - 352 - East

Certificate Number: aEc-lE-a-K-ZD5e4AVgb-GHxKjrn8akJCyx

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.69	22.33	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.69	31	Pass
Bedroom3	-	-	0.91	25.83	Pass
Kitchen	-	-	1.45	N/A	Pass
Living	-	-	1.13	N/A	Pass

View Details Online

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The password to access this data is: **4836957**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.69	22.33	Pass
Bedroom2	Noise - Restricted Openability	30 l/s Extract Fan	0.69	31	Pass
Bedroom3	-	-	0.91	25.83	Pass
Kitchen	-	-	1.45	N/A	Pass
Living	-	-	1.13	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 225 - 467 - South

Certificate Number: zoyqNd3SJlZqDv-nMKF34Ep-lFlFUq

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.61	21.67	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	1.09	26.17	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.7	26.33	Pass
Bedroom4	-	-	0.71	25.67	Pass
Dining	-	-	1.83	N/A	Pass
Kitchen	-	-	1.43	N/A	Pass
Living	-	-	1.37	N/A	Pass

View Details Online

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The password to access this data is: **1881731**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.61	21.67	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	1.09	26.17	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.7	26.33	Pass
Bedroom4	-	-	0.71	25.67	Pass
Dining	-	-	1.83	N/A	Pass
Kitchen	-	-	1.43	N/A	Pass
Living	-	-	1.37	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 226 - 581 - South

Certificate Number: 68-t1yg-TP87R4sqX-TywFt-EZH2-x-aAV

Assessor Name: Ali Kahraman

Date of Assessment: 10th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	1.01	28.83	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	1.43	27	Pass
Bedroom3	-	-	0.65	19	Pass
Bedroom4	-	-	0.69	15.83	Pass
Bedroom5	-	-	0.82	15.5	Pass
KitchenLiving	-	-	1.13	N/A	Pass
Living	-	-	1.49	N/A	Pass

View Details Online

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The password to access this data is: **3833792**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	1.01	28.83	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	1.43	27	Pass
Bedroom3	-	-	0.65	19	Pass
Bedroom4	-	-	0.69	15.83	Pass
Bedroom5	-	-	0.82	15.5	Pass
KitchenLiving	-	-	1.13	N/A	Pass
Living	-	-	1.49	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	10/07/2026

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TM59 Certificate of Assessment

Plot 227 - 467 - South

Certificate Number: rvsGy-Yxe-DI-0kxqnYTiKxaJG80-CV

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.72	16.17	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	1.55	30.33	Pass
Bedroom3	-	-	0.94	24.5	Pass
Bedroom4	-	-	0.68	19.33	Pass
Dining	-	-	2.66	N/A	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	1.62	N/A	Pass

View Details Online

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The password to access this data is: **9600618**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.72	16.17	Pass
Bedroom2	Noise - Restricted Openability	20 l/s Extract Fan	1.55	30.33	Pass
Bedroom3	-	-	0.94	24.5	Pass
Bedroom4	-	-	0.68	19.33	Pass
Dining	-	-	2.66	N/A	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	1.62	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 233 - 571 - North

Certificate Number: 47aKm-e9CFbSx1-sFw6MuoQb3MA-IR

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.64	29.17	Pass
Bedroom2	Noise - Restricted Openability	10 l/s Extract Fan	0.59	22.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.86	30.53	Pass
Bedroom4	Noise - Closed Night	40 l/s Extract Fan	0.95	31.67	Pass
Bedroom5	Noise - Closed Night	40 l/s Extract Fan	1.33	28.5	Pass
KitchenLiving	-	-	1.82	N/A	Pass
Living	-	-	0.7	N/A	Pass

View Details Online

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The password to access this data is: **2273416**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	20 l/s Extract Fan	0.64	29.17	Pass
Bedroom2	Noise - Restricted Openability	10 l/s Extract Fan	0.59	22.67	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.86	30.53	Pass
Bedroom4	Noise - Closed Night	40 l/s Extract Fan	0.95	31.67	Pass
Bedroom5	Noise - Closed Night	40 l/s Extract Fan	1.33	28.5	Pass
KitchenLiving	-	-	1.82	N/A	Pass
Living	-	-	0.7	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 237 - 341 - South

Certificate Number: LxE6g-Fra-Gy2-tP-QOefAv-yAVX-zC1YN-g6

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: South

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.96	24.83	Pass
Bedroom2	-	-	0.56	18	Pass
Kitchen	-	-	0.61	N/A	Pass
Living	-	-	1.28	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **9700233**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.96	24.83	Pass
Bedroom2	-	-	0.56	18	Pass
Kitchen	-	-	0.61	N/A	Pass
Living	-	-	1.28	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 238 - 354 - West

Certificate Number: lu5-l2b-oP0mEBuQ-lJxfBSvH-p7Z

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.98	29	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.98	31.17	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.58	23	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	1.18	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	30 l/s Extract Fan	0.98	29	Pass
Bedroom2	Noise - Closed Night	50 l/s Extract Fan	0.98	31.17	Pass
Bedroom3	Noise - Restricted Openability	30 l/s Extract Fan	0.58	23	Pass
Kitchen	-	-	1.18	N/A	Pass
Living	-	-	1.18	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 239 - 467 - North

Certificate Number: 5YhAoHl4-JXSu-Z-P-d9tOdvlqnS6

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.59	22	Pass
Bedroom2	Noise - Restricted Openability	-	1.27	31	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	1.11	31.67	Pass
Bedroom4	Noise - Restricted Openability	40 l/s Extract Fan	0.9	30.5	Pass
Dining	-	-	1.68	N/A	Pass
Kitchen	-	-	1.55	N/A	Pass
Living	-	-	1.14	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	-	-	0.59	22	Pass
Bedroom2	Noise - Restricted Openability	-	1.27	31	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	1.11	31.67	Pass
Bedroom4	Noise - Restricted Openability	40 l/s Extract Fan	0.9	30.5	Pass
Dining	-	-	1.68	N/A	Pass
Kitchen	-	-	1.55	N/A	Pass
Living	-	-	1.14	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 251 - 467 - North

Certificate Number: s3E3gZa010m7nifEUdu4WrNjs9

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.58	24	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.96	31.33	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.71	28.33	Pass
Bedroom4	Noise - Restricted Openability	40 l/s Extract Fan	0.81	29	Pass
Dining	-	-	1.4	N/A	Pass
Kitchen	-	-	1.77	N/A	Pass
Living	-	-	1.14	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.58	24	Pass
Bedroom2	Noise - Closed Night	40 l/s Extract Fan	0.96	31.33	Pass
Bedroom3	Noise - Closed Night	50 l/s Extract Fan	0.71	28.33	Pass
Bedroom4	Noise - Restricted Openability	40 l/s Extract Fan	0.81	29	Pass
Dining	-	-	1.4	N/A	Pass
Kitchen	-	-	1.77	N/A	Pass
Living	-	-	1.14	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 252 - 361 - East

Certificate Number: 4CyhP-QMh-5rs-7T6tvkfLd4r0wtw

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.62	27.33	Pass
Bedroom2	-	-	1.26	21.5	Pass
Bedroom3	-	-	1.3	22.17	Pass
Kitchen	-	Window made double opening casement - All glazing requires 0.38 G-value	2.66	N/A	Pass
Living	-	-	1.05	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	50 l/s Extract Fan	0.62	27.33	Pass
Bedroom2	-	-	1.26	21.5	Pass
Bedroom3	-	-	1.3	22.17	Pass
Kitchen	-	Window made double opening casement - All glazing requires 0.38 G-value	2.66	N/A	Pass
Living	-	-	1.05	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 253 - 467 - East

Certificate Number: oBhPQvu-mkPugSHVCM-g5B8nGlpJDn

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.58	20.67	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	1.07	26	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.67	26.67	Pass
Bedroom4	-	-	0.71	26	Pass
Dining	-	-	1.75	N/A	Pass
Kitchen	-	-	1.49	N/A	Pass
Living	-	-	1.26	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	0.58	20.67	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	1.07	26	Pass
Bedroom3	Noise - Restricted Openability	20 l/s Extract Fan	0.67	26.67	Pass
Bedroom4	-	-	0.71	26	Pass
Dining	-	-	1.75	N/A	Pass
Kitchen	-	-	1.49	N/A	Pass
Living	-	-	1.26	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 254 - 467 - Southwest

Certificate Number: J04iwKlG-hqXdonFrZc8N-j-MgT7Cd-r20

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Southwest

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	0.96	22.17	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	1.57	29	Pass
Bedroom3	Noise - Restricted Openability	40 l/s Extract Fan	0.91	27.83	Pass
Bedroom4	-	-	0.78	21.5	Pass
Dining	-	-	2.3	N/A	Pass
Kitchen	-	-	1.14	N/A	Pass
Living	-	-	1.84	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	0.96	22.17	Pass
Bedroom2	Noise - Restricted Openability	40 l/s Extract Fan	1.57	29	Pass
Bedroom3	Noise - Restricted Openability	40 l/s Extract Fan	0.91	27.83	Pass
Bedroom4	-	-	0.78	21.5	Pass
Dining	-	-	2.3	N/A	Pass
Kitchen	-	-	1.14	N/A	Pass
Living	-	-	1.84	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 255 - 364 - West

Certificate Number: DAn-Z5p-HNumpU-dJFDpGv1quJ6NTm

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.16	18.67	Pass
Bedroom2	Noise - Restricted Openability	50 l/s Extract Fan	1.2	31.83	Pass
Bedroom3	-	-	0.8	23.5	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	2.07	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.16	18.67	Pass
Bedroom2	Noise - Restricted Openability	50 l/s Extract Fan	1.2	31.83	Pass
Bedroom3	-	-	0.8	23.5	Pass
Kitchen	-	-	1.17	N/A	Pass
Living	-	-	2.07	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 256 - 364 - West

Certificate Number: xknyVbs53h-YEcvlXKv-t7y-o-WrlL0

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.11	18.83	Pass
Bedroom2	Noise - Restricted Openability	50 l/s Extract Fan	1.4	30.67	Pass
Bedroom3	-	-	0.96	22.33	Pass
Kitchen	-	-	1.28	N/A	Pass
Living	-	-	2.28	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.11	18.83	Pass
Bedroom2	Noise - Restricted Openability	50 l/s Extract Fan	1.4	30.67	Pass
Bedroom3	-	-	0.96	22.33	Pass
Kitchen	-	-	1.28	N/A	Pass
Living	-	-	2.28	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 257 - 364 - West

Certificate Number: 6ed1Ea89ylYs-Ut2M-HhWCul-JyU

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: West

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.09	18.33	Pass
Bedroom2	Noise - Restricted Openability	50 l/s Extract Fan	1.17	30.83	Pass
Bedroom3	-	-	0.77	21.83	Pass
Kitchen	-	-	1.14	N/A	Pass
Living	-	-	2.1	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	-	1.09	18.33	Pass
Bedroom2	Noise - Restricted Openability	50 l/s Extract Fan	1.17	30.83	Pass
Bedroom3	-	-	0.77	21.83	Pass
Kitchen	-	-	1.14	N/A	Pass
Living	-	-	2.1	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 258 - 467 - North

Certificate Number: clJhRwkQKXEOMKCkb6-YOFbh-tX5A-ox

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	0.58	24.67	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.33	29.5	Pass
Bedroom3	Noise - Restricted Openability	50 l/s Extract Fan	1.08	30	Pass
Bedroom4	Noise - Restricted Openability	40 l/s Extract Fan	0.88	29.17	Pass
Dining	-	-	1.75	N/A	Pass
Kitchen	-	-	1.54	N/A	Pass
Living	-	-	1.19	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	-	0.58	24.67	Pass
Bedroom2	Noise - Closed Night	60 l/s Extract Fan	1.33	29.5	Pass
Bedroom3	Noise - Restricted Openability	50 l/s Extract Fan	1.08	30	Pass
Bedroom4	Noise - Restricted Openability	40 l/s Extract Fan	0.88	29.17	Pass
Dining	-	-	1.75	N/A	Pass
Kitchen	-	-	1.54	N/A	Pass
Living	-	-	1.19	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 259 - 361 - North

Certificate Number: l3-xpExaNF-efWKr-ioc9fv1NS5b

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.52	29.5	Pass
Bedroom2	-	-	0.6	21.17	Pass
Bedroom3	-	-	0.63	21	Pass
Kitchen	-	-	2.07	N/A	Pass
Living	-	-	0.78	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.52	29.5	Pass
Bedroom2	-	-	0.6	21.17	Pass
Bedroom3	-	-	0.63	21	Pass
Kitchen	-	-	2.07	N/A	Pass
Living	-	-	0.78	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 260 - 361 - North

Certificate Number: sRx-J8xMdWzD1j5O-Ty-sWMFwtTgbu4M

Assessor Name: Ali Kahraman

Date of Assessment: 26th June 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: North

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.52	29.33	Pass
Bedroom2	-	-	0.6	21.17	Pass
Bedroom3	-	-	0.65	20.83	Pass
Kitchen	-	-	2.1	N/A	Pass
Living	-	-	0.77	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Closed Night	60 l/s Extract Fan	0.52	29.33	Pass
Bedroom2	-	-	0.6	21.17	Pass
Bedroom3	-	-	0.65	20.83	Pass
Kitchen	-	-	2.1	N/A	Pass
Living	-	-	0.77	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	26/06/2026

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TM59 Certificate of Assessment

Plot 261 - Kirdford - Northeast

Certificate Number: 3NozUrz-dICXU7RYGa0BIXK9BC

Assessor Name: Ali Kahraman

Date of Assessment: 14th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: Northeast

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	60 l/s Extract Fan	2.14	31.17	Pass
Bedroom2	Security - Closed Night	50 l/s Extract Fan	0.9	31.33	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.6	26.17	Pass
KitchenLiving	-	-	2.71	N/A	Pass

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The password to access this data is: **2128083**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	60 l/s Extract Fan	2.14	31.17	Pass
Bedroom2	Security - Closed Night	50 l/s Extract Fan	0.9	31.33	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.6	26.17	Pass
KitchenLiving	-	-	2.71	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	14/07/2026

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TM59 Certificate of Assessment

Plot 262 - Kirdford - East

Certificate Number: W0CrPfyQ8kP1-kc-zMNMa2iJrAYQo

Assessor Name: Ali Kahraman

Date of Assessment: 14th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	60 l/s Extract Fan	2.29	31.83	Pass
Bedroom2	Security - Closed Night	60 l/s Extract Fan	0.76	27.67	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.87	28.17	Pass
KitchenLiving	-	Patio requires 0.4 G-value	2.26	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	60 l/s Extract Fan	2.29	31.83	Pass
Bedroom2	Security - Closed Night	60 l/s Extract Fan	0.76	27.67	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.87	28.17	Pass
KitchenLiving	-	Patio requires 0.4 G-value	2.26	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	14/07/2026

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TM59 Certificate of Assessment

Plot 263 - Kirdford - East

Certificate Number: bH-4hjc7d-R2tl-Kq-C-4-Zx3yiA-nsW4d-m

Assessor Name: Ali Kahraman

Date of Assessment: 14th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	70 l/s Extract Fan	2.22	31.5	Pass
Bedroom2	Security - Closed Night	60 l/s Extract Fan	0.7	27.33	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.82	28.67	Pass
KitchenLiving	-	-	2.43	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	70 l/s Extract Fan	2.22	31.5	Pass
Bedroom2	Security - Closed Night	60 l/s Extract Fan	0.7	27.33	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.82	28.67	Pass
KitchenLiving	-	-	2.43	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	14/07/2026

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TM59 Certificate of Assessment

Plot 264 - Kirdford - East

Certificate Number: 6II-TLUX-VFz-sn6v-Fh4yhol-IwYc8qY

Assessor Name: Ali Kahraman

Date of Assessment: 14th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	80 l/s Extract Fan	2.15	30.67	Pass
Bedroom2	Security - Closed Night	60 l/s Extract Fan	0.79	29.67	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.9	30.5	Pass
KitchenLiving	-	Patio requires 0.4 G-value	2.75	N/A	Pass

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Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

The table presented above outlines the internal gains associated with different living spaces, considering occupant activity patterns and appliance loads. This data is instrumental in predicting the thermal performance of residential units:

- **Living Spaces Classification:** The first column categorises the residential areas based on the space's intended function and capacity, ranging from studio apartments to communal corridors.
- **Occupant Activity:** The second column provides a detailed breakdown of anticipated human thermal gains. The gains differ during the day, considering typical occupancy patterns and varying metabolic rates.
- **Appliance Loads:** The third column lists the anticipated electrical loads from appliances and equipment in the living space. The information takes into account peak usage times and base loads, presenting a realistic scenario of energy consumption.

These gains are key in TM59 assessments to ensure thermal comfort and reduce overheating risks in living spaces.

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	80 l/s Extract Fan	2.15	30.67	Pass
Bedroom2	Security - Closed Night	60 l/s Extract Fan	0.79	29.67	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.9	30.5	Pass
KitchenLiving	-	Patio requires 0.4 G-value	2.75	N/A	Pass

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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

Key Design Measures:

Informed by the local context, the proposal integrates both passive and active design strategies:

- **Energy Efficiency:** The recommendation includes energy-efficient lighting and appliances, which help minimise internal heat gains.
- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
- **Mechanical Ventilation:** Adequate Flow Rate and Air Changes per Hour (ACH) have been specified to ensure optimal indoor air quality.
- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	14/07/2026

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TM59 Certificate of Assessment

Plot 265 - Kirdford - East

Certificate Number: PzBi-jn-3Ymax-5XHf0ADGtjH-19pVs

Assessor Name: Ali Kahraman

Date of Assessment: 14th July 2026

Developer: Vistry

Site: Glebe Farm

Plot Orientation: East

Drawing Ref:

Weather File Used: London_GTW_DSY1_2020High50

Software Used: DesignBuilder v7.2.0.032

Assessment Results

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
Bedroom1	Noise - Restricted Openability	80 l/s Extract Fan	2.02	30.67	Pass
Bedroom2	Security - Closed Night	50 l/s Extract Fan	0.82	31.83	Pass
Bedroom3	Security - Closed Night	50 l/s Extract Fan	0.81	30.17	Pass
KitchenLiving	-	Patio requires 0.4 G-value	2.73	N/A	Pass

View Details Online

Scan the QR code or click here to access the detailed version of this certificate.
The password to access this data is: **3935625**

Briary Energy Ltd. has demonstrated competence in the field of TM59 and the use of DesignBuilder. While we acknowledge their expertise, Kaizen Certification does not accept responsibility or liability for the content, accuracy, or any other aspect of the information presented within this assessment.

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Scope and Exclusions

Briary Energy Ltd has been commissioned by Vistry to conduct an overheating analysis of Glebe Farm. This analysis aims to provide design stage guidance and enhance occupant comfort levels. The adoption of thermal modelling, specifically TM59, is in line with the requirements of Part O of the UK Building Regulations. It is either because the simplified method was not deemed suitable, or there was a failure in compliance using the simplified method. Another rationale for adopting TM59 might include concerns related to noise, security, or pollution.

All conclusions and recommended approaches are directly shaped by the input data specified in this document. Variations to these inputs might result in differing outcomes.

It's vital to recognise that any modelling process necessitates certain assumptions and approximations. The details of these are provided in this report for transparency.

The findings are based on specialised computer modelling software that takes into account climatic conditions and typical usage patterns. However, these might not precisely mirror real-world scenarios. As such, the results should be seen as predictions following the TM59 methodology, rather than as definitive real-life outcomes.

Acoustic Requirements

A Noise Report supplied by Ardent Consulting Engineers, Ref 2407850_A-ACE-XX-00-RP-C-0621, offers guidance on the extent to which openable windows may be utilised for purge ventilation as a component of the TM59 overheating assessment strategy. The illustration online demonstrates the facades that will require closed/restricted window openability during the night-time hours of 23:00 - 07:00 for purge ventilation to alleviate overheating. If alternative means of ventilation have been employed these are shown on each plot certificate.

Criteria for defining overheating - Natural Ventilation

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space has to comply with the following criteria:

- **Criterion A** For living rooms, kitchen and bedrooms: the number of hours during which ?T is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent of occupied hours (Same as Criterion 1 of TM52).
- **Criterion B** For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00, equivalent to 32 hours).

Bedroom Window Considerations for TM59

For properties with bedrooms located on the ground floor or those with windows that can be easily accessed, adhere to the following guidelines:

- **Daytime:** Bedroom windows, patio doors, or balcony doors can be modelled as open, provided it's secure to do so.
- **Nighttime:** Due to concerns related to noise, security, or pollution, it's recommended to model ground floor bedroom windows, patio doors, and balcony doors as closed.

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Construction Details

External Walls: 0.18 W/m².K

Floor: 0.11 W/m².K

Roof: 0.09 W/m².K

Window U-Value: 1.3 W/m².K

Window G-Value: 0.46 (BFRC)

Thermal Mass Details

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (masonry with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Thermal Mass: In the context of building design, thermal mass refers to the capability of a material to absorb, store, and release heat energy. High thermal mass materials can absorb heat during the day and release it during the night, helping to naturally regulate indoor temperatures and reduce the demand on HVAC systems. Conversely, lightweight constructions typically have lower thermal mass and are less effective at storing and releasing heat.

In the provided table, the thermal mass characteristics of various construction types within the development are detailed. The constructions are labelled as 'Lightweight', indicating that they have a lower capacity for heat storage and release. Such lightweight constructions might have faster response times to heating or cooling, but they do not offer the benefits of heat storage and delayed release that heavyweight constructions do. Therefore, their impact on the building's overall thermal performance, especially in mitigating overheating, should be carefully considered in a TM59 assessment.

Model Details

Details of the occupancy profiles used: DesignBuilder TM59 Occupation Profiles

Details of the equipment profiles used: DesignBuilder TM59 Equipment Profiles

Details of the opening profiles used: DesignBuilder TM59 Opening Profiles

Infiltration Rates Assumed: Approx. 4.01 m³/h/m² @50pa

Free Area: Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated.

Windows: Where windows are shown as openable these form part of the overheating mitigation strategy and are to meet the protection from falling guidance within Approved Document O.

Doors: Internal doors are modelled as being closed at night in line with CIBSE TM59.

Mechanical Supply/Extract: dMEV

Lighting: Part L compliant scheme.

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Weather File Used

London_GTW_DSY1_2020High50

Closest Weather Data Set Gatwick

Thermal Comfort Category

Based on CIBSE TM52 (2013): Category II (Normal expectation)

Approved Document O: Overheating Regulations

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings. It provides the following directives:

Requirement O1:

Requirement O1 is satisfied when a building is designed and constructed to accomplish both:

1. Limiting unwanted solar gains in summer.
2. Providing an adequate means of removing excess heat from the indoor environment.

NOTE: The guidance and regulations are drafted to safeguard health and welfare. Adhering to this guidance does not ensure the comfort of building occupants.

Compliance Methods:

In the Secretary of State's perspective, adherence to requirement O1 can be shown by employing one of these methods:

1. The simplified method for limiting solar gains and ensuring a means of heat removal.
2. The dynamic thermal modelling method.

For this development, the proposed assessment approach is the **dynamic thermal modelling**. According to Approved Document O, compliance through this method is realised by following the guidelines below:

Dynamic Thermal Modelling Guidelines:

To showcase compliance with the dynamic thermal modelling method, the subsequent guidelines must be observed:

1. CIBSE's TM59 methodology for predicting overheating risk.
2. The restrictions applied to CIBSE's TM59 methodology.
3. Recommended strategies for curtailing overheating risk.

The building control body should receive a report demonstrating that the residential structure meets CIBSE's TM59 criteria for overheating evaluation. This report encapsulates details as outlined in CIBSE's TM59, section 2.3.

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Internal Conditions

Unit/room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
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Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only

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Results of Analysis

Room	Window Closure: Noise, Security, Pollution	Overheating Solution	Criterion A	Criterion B	Result
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Overall Assessment

Thermal Comfort Assessment & Compliance

The building, as designed, adheres to the TM59 thermal comfort criteria across all the evaluated zones. By adopting both passive and active design measures, the scheme effectively mitigates overheating risks. The simulation results affirm the scheme's full compliance with overheating requirements stipulated by CIBSE TM59 under the current weather conditions.

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- **Enhanced Building Fabric:** Insulation levels exceed Building Regulations standards, coupled with glazing solar factors as low as 0.46 (BFRC), curtailing solar gains.
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- **Specialised Solutions:** dMEV are designated for all wet rooms.

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Part O Compliance Details

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder v7.2.0.032
Weather file location used, including any additional, more extreme weather files	London_GTW_DSY1_2020High50
Number of sample units modelled, including an explanation of why the size/selection has been chosen	1
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profile
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
2b.3 Modelled overheating mitigation strategy	
Free areas	Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each opening's free area is individually calculated.
Infiltration and mechanical flow rates	Wet Rooms - dMEV
Window g-value	0.46 (BFRC)
Shading strategy	N/A
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Assessors name	Ali Kahraman
Assessors organisation	Briary Energy Ltd
Assessor's signature	Ali Kahraman
Registration number (if applicable)	KAZN000006
Date of design	14/07/2026

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