



FORMER NOVARTIS SITE, HORSHAM – PHASE 3

ADO (Overheating) Noise Assessment

Reference: 15998.RP01.ADO.0

Prepared: 17 August 2026

Revision Number: 0

[Lovell](#)

Suite B

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Farnham

GU9 8QT

ADO (Overheating) Noise Assessment



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Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	17 August 2026	Toby Walton	Joe Allen

Terms of contract:

RBA Acoustics Ltd have prepared this report in accordance with our Scope of Work 15998.ACB01.0 dated 30 June 2026. RBA Acoustics Ltd shall not be responsible for any use of the report or its contents for any purpose other than that for which it was provided. Should the Client require the distribution of the report to other parties for information, the full report should be copied. No professional liability or warranty shall be extended to other parties by RBA Acoustics Ltd without written agreement from RBA Acoustics Ltd.

The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.



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1. INTRODUCTION

RBA Acoustics has undertaken an assessment of the external noise levels affecting future residential dwellings at the Former Novartis Site, Horsham with regards to the risk of overheating.

Many buildings require closed windows to provide good internal acoustic conditions, however, opening a window is the normal way to keep a building cool, especially during the warmer summer months. These opposing requirements have become a major issue in the design of buildings, in particular for housing, especially given the requirement to avoid the widespread use of mechanical cooling.

Approved Document O of the Building Regulations Approved Document O (published 15 December 2021) covers the overheating mitigation requirements of the Building Regulations. Within the document, consideration is given to the potential for excessive levels of noise that may be experienced by occupants during the night-time if opening windows forms the overheating mitigation strategy. It provides noise level targets, stating that if noise levels exceed these values with windows open then occupants are likely to keep the windows closed. As such, the overheating strategy must take account of this.

An assessment has been undertaken, based on typical room and window dimensions for the development, to indicate the extent of internal noise levels when windows are open to mitigate overheating. Where there are exceedances of the criteria, the largest window opening area to achieve the noise level criteria has been given.

Additionally, an assessment has been carried out in relation to the noise levels likely to be incident on the proposed building façades and to provide acoustic performance specifications such that acceptable internal noise criteria can be achieved.

This report is intended to support the discharge of Pre-Commencement Condition 11.

2. PRE-COMMENCEMENT CONDITION 11

We are in receipt of the following pre-commencement condition which has been applied to the development:

“Other than works of site survey and investigations, no development shall commence until a scheme of noise mitigation and mechanical ventilation sufficient to prevent overheating and maintain thermal comfort for all dwellings shall be submitted to for approval in writing from the Local Planning Authority. Any mechanical ventilation shall then be designed in accordance with the ANC Acoustics Ventilation and Overheating: Residential Design Guide 2020. The scheme shall also include performance details and a glazing plan sufficient to achieve the habitable room standards as detailed in BS 8233:2014 (and appropriate consideration of Lamax including details of post construction validation measurements). The dwellings shall be constructed in accordance with the approved details.”

3. BUILDING REGULATIONS APPROVED DOCUMENT O (ADO)

Building Regulations Approved Document O (2021 edition) provides guidance for mitigating overheating within residential developments. The document states that the building should be constructed to meet the requirement using passive means as far as reasonably practicable. With regards to removing excess heat, the first choice is therefore to use openable windows to mitigate overheating.

The document provides a simplified method for demonstrating compliance and an alternative, more detailed, dynamic thermal modelling approach. With regards to acoustic impact the following references are made:

3.1 *The standards in this section may mean that the standards of the simplified method cannot be met. For example, if external noise is an issue, it is unlikely that windows would be opened by an occupant and therefore the minimum free areas of the simplified method cannot be met. In such cases, **dynamic thermal modelling** should be used.*

NOISE

3.2 *In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating strategy should take into account of the likelihood that windows will be closed during sleeping hours (11 pm to 7 am).*

3.3 *Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.*

- (a) *40 dB $L_{Aeq,T}$ averaged over 8 hours (between 11 pm and 7 am)*
- (b) *55 dB L_{AFmax} more than 10 times a night (between 11 pm and 7 am)*

3.4 *Where in-situ noise measurements are used as evidence of that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use.*

NOTE: *Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020)."*

With reference to the above Paragraph 3.3, the following limiting external free-field levels (as would be measured on a site prior to development) are implied (as no specific external threshold limits are provided directly). External noise levels above these values would not permit the use of the simplified method (as referred to in Paragraph 3.1) and dynamic thermal modelling should be used to demonstrate compliance:

Table 1* – External Noise Levels above which the Simplified Method cannot be Used

Parameter	High Risk Location	Moderate Risk Location
$L_{Aeq, 8h}$, averaged over 8 hours (between 23:00 – 07:00)	44 dB	49 dB
L_{AFmax} , more than 10 times a night (between 23:00 – 07:00)	59 dB	64 dB

* This table has been reproduced with reference to the IOA & ANC document 'Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O – July 2022'.

The following should be noted with regards to the above:

- High / Moderate Risk refers to the risk of overheating (not noise)
- The noise thresholds are low and likely to be exceeded at most sites within towns and cities and also those in proximity to infrastructure / transport routes etc.

4. EXTERNAL BUILDING FABRIC CRITERIA

This section outlines typical assessment criteria in terms of the relevant standards.

A summary of acoustic terminology is included in Appendix A.

4.1 British Standard 8233:2014

British Standards Institution (2014) *BS 8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings* draws on the results of research and experience to provide information on achieving internal acoustic environments appropriate to their functions.

The noise level values given are in terms of an average (L_{Aeq}) level.

The standard advises internal ambient noise levels for achieving suitable resting and sleeping conditions within residential properties as set out in Table .

Table 2 – BS 8233:2014 Residential Criteria

Room	Daytime (07:00 to 23:00)	Night-time (23:00 to 07:00)
Living Rooms	35 dB $L_{Aeq,16hour}$	--
Dining Room/area	40 dB $L_{Aeq,16hour}$	--
Bedrooms	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

4.2 World Health Organisation (WHO) Guidelines

WHO (2018) *Environmental Noise Guidelines for the European Region* sets out to define “*recommended exposure levels for environmental noise in order to protect population health*”. The guidance document relates specifically to external noise levels, and recommends that “*all CNG [WHO (1999) Guidelines for Community Noise] indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid*”. RBA therefore make reference to Guidelines for Community Noise for recommendations on internal noise levels.

Guidelines for Community Noise describes guideline levels that are “*essentially values for the onset of health effects from noise exposure*”. A table of guideline values is included, relating to adverse health effects, defined as any temporary or long-term deterioration in physical, psychological, or social functioning that is associated with noise exposure. The following is an extract from Table 4.1: Guideline values for community noise in specific environments, as stated in the WHO document.

Table 3 – Guideline Values for Community Noise

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time Base (hours)	L_{Amax} (dB)
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-times	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

With reference to maximum noise levels the following guidance is provided within the WHO guidance:

“For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991) and most studies show an increase in the percentage of awakenings at SEL values of 55-60 dBA (Passchier-Vermeer 1993; Finegold et al. 1994; Pearsons et al. 1995). For intermittent events that approximate aircraft noise, with an effective duration of 10-30s, SEL values of 55-60 corresponds to a L_{Amax} value of 45 dB. Ten to 15 of these events during an 8 hour night-time implies a $L_{Aeq, 8h}$ of 20-25 dB. This is 10-15 dB below the $L_{Aeq, 8h}$ or 30 dB for continuous night-time noise exposure, and shows that intermittent character of noise must be taken into account when setting night-time noise limits for noise exposure. For example, this can be achieved by considering the number of noise events and the difference between the maximum sound pressure level and the background of these events.”

Therefore, the frequency of occurrence of maximum noise events should not typically exceed 10-15 times in any night.

4.3 Summary of Internal Noise Level Criteria

The adopted project criteria are given below for habitable rooms used during the daytime (e.g.: living rooms and bedroom) and during the night-time (e.g.: bedrooms):

Table 4 – Summary of Internal Noise Level Criteria

Measurement Period	Period-Averaged Noise Level, $L_{Aeq,T}$ (dB)	Maximum Noise Level, $L_{AFmax,5min}$ (dB)
Daytime (07:00 – 23:00)	≤ 35	-
Night-time (23:00 – 07:00)	≤ 30	≤ 45

5. SITE DESCRIPTION

The site is located in Horsham town centre, with Parsonage Road running to the north. A trainline is runs along the east of the site serving Horsham and Littlehaven stations, with an industrial park located on the other side of the line. A trainline also runs to the south of the site serving Horsham and Warnham stations. To the west of the site is the area designated for Phases 1 and 2 of the same development.

Noise levels at the site were noted to mainly consist of road traffic noise arising from Parsonage Road and the wider road network. Noise levels at the east of the site were also noted to consist of slow-moving train-pass bys, and low level industrial noise.

The site is shown in relation to its surroundings in the site plan in Figure 1 Appendix F.

6. ENVIRONMENTAL NOISE SURVEY

6.1 Survey Methodology

Monitoring of the prevailing background noise was undertaken over the following periods:

- MP1-3: 15:00 hours Tuesday 19 November to 14:00 hours Thursday 21 November 2024.
- MP4: 15:00 hours Friday 29 August to 15:00 hours Tuesday 2 September 2025.

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period. However, based on observations during the site visits and weather reports for the area, conditions were generally considered suitable for obtaining representative noise measurements, being predominantly dry with little wind.

Measurements were made of the L_{A90} , L_{Amax} and L_{Aeq} noise levels over sample periods of 15 minutes.

6.2 Measurement Locations

To determine the existing noise climate around the site measurements were undertaken at the following locations:

Table 5 – Measurement Positions

Measurement Position	Location	Description
MP1	Parsonage Road	The microphone was installed on a boom at a height of approximately 3 m from ground level, to achieve line of sight to Parsonage Road above the site hoarding. The dominant noise source in this location was road traffic noise from Parsonage Road.
MP2	East Railway Line	The microphone was installed on a tripod, placed on a concrete upstand to achieve line of sight to the railway line. The dominant noise in this location was train-passbys and to a lesser extent, industrial activity from within the industrial park.
MP3	Centre of Site	The microphone was installed on a tripod at a height of approximately 1.5 m from ground level, located to the west of the existing Novartis building. Noise levels at this location were noted to be generally low level but were dominated by distant road traffic noise.
MP4	South Railway Line	The microphone was installed on a boom at a height of approximately 3 m from ground level, to achieve line of sight to the railway line above the site hoarding. The dominant noise source in the location was the occasional train-passby.

The measurement positions are also illustrated on the site plan attached in Figure 1 and photos in Figures 2 – 5 Appendix F.

6.3 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix B.

The sound level meters were calibrated both prior to and on completion of the survey with no significant calibration drifts observed.

6.4 Results

The noise levels measured are shown as time-histories on the attached Graphs 1-9 Appendix F.

The measured period-averaged L_{Aeq} and typical night-time L_{AFmax} noise levels are summarised in Table 6, below:

Table 6 – Baseline Survey Measured Noise Levels

Position	Typical Background Noise Level, $L_{A90,15min}$ (dB)		Time-Averaged Noise Level, L_{Aeq} (dB)		Typical Maximum Noise Level, $L_{AFmax,5min}$ (dB)
	Daytime (07:00-23:00)	Night-time (23:00-07:00)	Daytime (07:00-23:00)	Night-time (23:00-07:00)	Night-time (23:00-07:00)
MP1	49	37	65	55	76
MP2	47	44	61	56	74
MP3	47	32	51	43	59
MP4	47	42	53	50	69

7. ADO ASSESSMENT

This section provides a detailed assessment, which considers the sound reduction through an open window with recognition of the free area of opening.

7.1 Assumptions

7.1.1 Drawings

The following drawings have been used in the assessment.

Drawing Number	Revision	Description	Date
17100-HGP-P3-00-D-A-1004	P01	Block Plan - Ground	24 July 2026
17100-HGP-P3-00-D-A-1005	P01	Block Plan – First	24 July 2026
17100-HGP-P3-00-D-A-1006	P01	Block Plan - Second	24 July 2026
17100-HGP-P3-00-D-A-1007	P01	Block Plan – Third	24 July 2026

7.1.2 Noise Levels

The noise levels obtained in Section 6 have been used in the assessment to determine the façade incident noise levels.

7.1.3 External Wall

It is assumed that the external non-glazed areas are to comprise the following:

- Brickwork
- Thermal insulation and cavity
- Metsec type frame with mineral wool in void
- 2No. layers 15 mm dense plasterboard (min 12.5 kg/m² per board)

As such, we have assumed sound reduction indices equating to an overall R_w of 58 dB for all non-glazed façade areas comprising the above construction.

7.1.4 Openable Window Area

We understand that the window opening area for the bedroom windows is 1.28 m², based on the elevations and assuming that the openable window portion open to 90 degrees and is side hung. This gives an equivalent free area of 1.13 m².

7.2 Results

Table 7 details the results of the assessment for the façades of the development. A façade zoning plan is provided in Figure 7 – Appendix F.

Table 7 - Measured levels and Risk Categorisation

Façade	Predicted Internal Night-time L_{Aeq} Noise Level (dB)	ADO Night-time L_{Aeq} Criteria (dB)	Predicted Internal Typical Night-Time L_{AFmax} (dB)	ADO Night-time L_{AFmax} Criteria (dB)
Zone 1	45	40	60	55
Zone 2	44	40	59	55
Zone 3	42	40	57	55
Zone 4	39	40	54	55

As can be seen from Table 7, a standard window opening area of 90 degrees results in exceedances of the Approved Document O criteria at some façades.

In order to further investigate, Table 8 outlines the window opening area that should prove acceptable acoustically.

Table 8 – Maximum Window Opening Area to Achieve Internal Noise Level Criteria

Façade	Opening Angle	Indicative Restrictor Size	Associated Equivalent Free Area (m ²)
Zone 1	12 degrees	178 mm	0.44
Zone 2	15 degrees	222 mm	0.52
Zone 3	25 degrees	368 mm	0.73
Zone 4	90 degrees (i.e. unrestricted)	1202 mm	1.13

As can be seen above, varying levels of window opening are capable of achieving the Approved Document O criteria.

7.3 TM59 Assessment

The TM59 assessment undertaken by Waterstone Design is appended to this report.

8. EXTERNAL BUILDING FABRIC ASSESSMENT

8.1 Background

Analyses of the external building fabric have been undertaken in order to ascertain the required acoustic performance of the glazing and other external fabric elements to achieve the project criteria.

8.2 Assumptions

Our external building fabric analyses have assumed the following:

8.2.1 Drawings

The assessment has been based on the information provided in the following drawings:

Drawing Number	Revision	Description	Date
17100-HGP-P3-00-D-A-1004	P01	Block Plan - Ground	24 July 2026
17100-HGP-P3-00-D-A-1005	P01	Block Plan – First	24 July 2026
17100-HGP-P3-00-D-A-1006	P01	Block Plan - Second	24 July 2026
17100-HGP-P3-00-D-A-1007	P01	Block Plan – Third	24 July 2026

8.2.2 Noise Levels

The assessment has been based on the measured noise levels as detailed in 6.4.

8.2.3 Room Absorption

The calculations assume that bedrooms are acoustically ‘soft’ with carpets, curtains and other soft furnishings. The living rooms are assumed to be less acoustically absorptive (with a hard floor finish, although with furnishings).

Details of the absorption coefficients assumed in the calculations are provided in Appendix C.

8.2.4 External Wall

External non-glazed areas are to comprise the following:

- Brickwork
- Thermal insulation and cavity
- Metsec type frame with mineral wool in void
- 2No. layers 15 mm dense plasterboard (min 12.5 kg/m² per board)

As such, RBA have assumed the following sound reduction indices (equating to an overall R_w of 58 dB) for all non-glazed façade areas:

Table 9 – Assumed Sound Reduction Indices of Non-Glazed Elements

Assumed Minimum Sound Reduction Index [dB] at Octave Band Centre Frequency [Hz]							
63	125	250	500	1k	2k	4k	8k
35	42	48	53	63	70	74	74

Should the proposals for non-glazed areas change, it is critical RBA are informed at the earliest opportunity as this could have a significant impact on the sound insulation performance requirements of the glazing systems.

8.2.5 Ventilation

It is understood that mechanical ventilation systems are to be installed in line with Part F regulations to all dwellings and therefore trickle ventilators are required. Apartment bedrooms are to be provided with MVHR.

8.3 Specification & Guidance Constructions

Appendix D details the sound reduction performance specification for the ventilators and glazed elements of the external building fabric.

The glazing performance specifications apply to the glazing package as a whole – inclusive of glazing, louvres, spandrel panels, framing, opening lights, doors, seals, etc. The performance of the glazing system will depend on many factors such as the glazing configuration, size of window panels, quality of framing, quality of sealing, etc.

Please note – The glazing configurations described in Table 10 and ventilator types described in Table 11 are given for costing purposes only. All window systems should be capable of meeting the performance specifications shown in Appendix D, with laboratory test certificates being made available in support of the quoted performance. Glazing proposals which simply reflect the guidance constructions indicated in this report will not, in isolation, be sufficient evidence that a window configuration will meet the performance specification.

For guidance purposes RBA would typically expect the following glazing configurations to prove commensurate with achieving the sound insulation performance specifications detailed within Appendix D.

Table 10 – Guidance on Glazing Constructions

Glazing Type	Example Glazing Configuration	Façade
G1	Standard thermal double glazing of differing pane thicknesses e.g., 4 mm glass / 12 mm air gap / 6 mm glass	All

For guidance purposes RBA would typically expect the following trickle ventilator types to prove commensurate with achieving the sound insulation performance specifications detailed within Appendix D.

Table 11 – Guidance on Trickle Ventilators

Ventilator Type	Example Ventilator Type	Façade
V1	'Hit-and-miss' trickle ventilator	All

9. CONCLUSION

RBA Acoustics has undertaken an assessment of the external noise levels affecting future residential dwellings at the Former Novartis Site, Horsham Development with regards to the risk of overheating.

Noise levels measured at the site location are presented within this report and used in order to determine the risk to the development of fully opening windows during the night-time to alleviate overheating and the resultant impact on internal noise levels within future dwellings.

An assessment has been undertaken of the predicted internal noise levels. This assessment indicates that some restriction to the level of window opening at the worst-affected facades will be required to achieve suitable internal noise levels.

Additionally, an assessment of the glazing requirements to ensure suitable internal noise levels are achieved at the proposed development with reference to BS 8233:2014 and WHO Guidelines has been undertaken.

Appendix A - Acoustic Terminology

A-weighting (e.g. dB(A))	A correction applied across the frequency bands to take into account the response of the human ear, and therefore considered to be more representative of the sound levels people hear.
DeciBel (dB)	Unit used for many different acoustic parameters. It is the logarithmic ratio of the level being assessed to a standard reference level.
$L_{eq,T}$	The level of a notional steady sound which, over a stated period of time, T , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
$L_{Aeq,T}$	The A-weighted level of a notional steady sound which, over a stated period of time, T , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
L_{An} (e.g. L_{A10} , L_{A90})	The sound level exceeded for n% of the time. E.g. L_{A10} is the A-weighted level exceeded for 10% of the time and as such can be used to represent a typical maximum level. Similarly, L_{A90} is the level exceeded for 90% of the measurement period, and is often used to describe the underlying background noise.
$L_{Amax,T}$	The instantaneous maximum A-weighted sound pressure level which occurred during the measurement period, T . It is commonly used to measure the effect of very short duration bursts of noise, e.g. sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the ambient level.
Octave band	A frequency band in which the upper limit of the band is twice the frequency of the lower limit.
1/3 Octave band	A frequency band which is one-third of an octave band.

Appendix B - Instrumentation

The following equipment was used for the acoustic measurements.

Table B1 - Equipment Calibration Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Expiry Date
Norsonic Type 1 Sound Level Meter	Nor140	1407962	UCRT24/1149	24 January 2026
Norsonic Pre Amplifier	1209	23790		
Norsonic ½" Microphone	1225	496129		
Norsonic Sound Calibrator	1255	125526426	UCRT24/1140	24 January 2026
Norsonic Type 1 Sound Level Meter	Nor140	1407961	477987612	8 May 2025
Norsonic Pre Amplifier	1209	23789		
Norsonic ½" Microphone	1225	496124		
Norsonic Sound Calibrator	1255	125526425	Cal 022-2023-17161	5 May 2025
Norsonic Type 1 Sound Level Meter	Nor140	1406262	U44036	18 April 2025
Norsonic Pre Amplifier	1209	20487		
Norsonic ½" Microphone	1225	469005	44035	18 April 2025
Norsonic Sound Calibrator	1251	34429	U44034	18 April 2025
Norsonic Type 1 Sound Level Meter	Nor140	1403127	U43500	28 February 2025
Norsonic Pre Amplifier	1209A	12071		
Norsonic ½" Microphone	1225	41473	43499	28 February 2025
Norsonic Sound Calibrator	1251	31986	U43498	28 February 2025
Norsonic Type 1 Sound Level Meter	Nor140	1407795	U45897	7 November 2025
Norsonic Pre Amplifier	1209	23230		
Norsonic ½" Microphone	1225	468969	45896	7 November 2025
Norsonic Sound Calibrator	1255	125525755	U45674	19 October 2025

Appendix C – Absorption Coefficients

For the purpose of the analyses RBA Acoustics have assumed the absorption coefficients detailed in Table B1 for Bedrooms and Table B2 for living rooms.

Table B2 – Bedroom Absorption Coefficients

Absorption Coefficient (α) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.25	0.27	0.31	0.32	0.32	0.32

Table B3 – Living Room Absorption Coefficients

Absorption Coefficient (α) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.20	0.22	0.22	0.22	0.23	0.27

Appendix D – External Building Fabric Acoustic Specification

External facade constructions and components, such as brise soleil, grilles, ventilators, curtain walling systems or other architectural features, are not to give rise to intrusive whistling, creaking, rattling or other noises as a result of wind or other climatic effects.

The Contractor shall take reasonable precautions to avoid unwanted noise including creaking, rattling and whistling being generated by the Contractors works when subject to environmental conditions (including wind) and thermal expansion over the life of the façade.

1.0 Window Sound Insulation Performance

Glazed units (inclusive of glazing, louvres, timber panels, spandrel panels, infill panels, framing, opening lights, balcony/terrace doors, seals, etc. as appropriate) should achieve the following minimum sound reduction indices as tested in general accordance with BS EN ISO 10140-2:2021:

Table C1 – Window Sound Insulation Performance Specification

Type	Minimum Recommended Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)								R_w (dB)
	63	125	250	500	1k	2k	4k	8k	
G1									

Note: R_w is the “overall weighted sound reduction index” tested in a laboratory.

N.B. as the internal noise criteria is expressed in overall terms, other frequency-specific performance levels may ultimately prove acoustically acceptable. Test data for representative samples of all glazing systems shall be submitted to RBA Acoustics for approval to demonstrate compliance with the above performance specifications.

2.0 Ventilator Sound Insulation Performance

Trickle ventilators (in their open state) should achieve the following minimum element-normalised level differences as tested in accordance with BS EN 20140-10:2021:

Table C2 – Ventilator Sound Insulation Performance Specification

Type	Minimum Recommended $D_{n,e}$ (dB) at Octave Band Centre Frequency (Hz)								$D_{n,e,w}$ (dB)
	63	125	250	500	1k	2k	4k	8k	
V1									

Note: $D_{n,e,w}$ is the “overall weighted element normalised level difference” tested in a laboratory.

Please note the above specification assumes one trickle ventilator will be installed per room, i.e. a continuous mechanical extract system (ADF System 3) will be utilised. The specification should be increased by a factor of $10\log(N)$ should N ventilators be required per room, i.e. increase by +3dB or +5dB respectively should two or three ventilators be required per room.

N.B. as the internal noise criteria are expressed in overall terms, other frequency specific performance levels may ultimately prove acoustically acceptable. Test data for the trickle vents in their open state shall be submitted to RBA Acoustics for approval.

Appendix E – CDM Considerations

The Likelihood (**L**) the harm will occur can be assessed by applying an indicative score (from 1 to 5) as follows:

- 1 – Remote (almost never)
- 2 – Unlikely (occurs rarely)
- 3 – Possible (could occur, but uncommon)
- 4 – Likely (recurrent but not frequent)
- 5 – Very likely (occurs frequently)

The Severity of harm (**S**) can be assessed by applying an indicative score (from 1 to 5) as follows:

- 1 – Trivial (e.g. discomfort, slight bruising, self-help recovery)
- 2 – Minor (e.g. small cut, abrasion, basic first aid need)
- 3 – Moderate (e.g. strain, sprain, incapacitation for more than 3 days)
- 4 – Serious (e.g. fracture, hospitalisation for more than 24 hours, incapacitation for more than 4 weeks)
- 5 – Fatal (single or multiple)

The rating value is obtained by multiplying the two scores and is then used to determine the course of action.

Table D1- Risk Ratings

Rating Bands (Likelihood x Severity)		
Low Risk (1 – 8)	Medium Risk (9 -12)	High Risk (15 – 25)
May be ignored but ensure controls remain effective	Continue, but implement additional reasonable practicable controls where possible	Avoidance action is required; therefore alternative design solutions must be examined. Activity must not proceed until risks are reduced to a low or medium level

The following hazards pertinent to our design input have been identified and control measures suggested:

Table D2 – Risk Assessment

Hazard	Risk Of	At Risk	Rating			Control Measures	Controlled		
			L	S	R		L	S	R
Mineral wool within drywalls and linings	Skin and respiratory irritation	Contractors	4	3	12	Wear gloves and mask	1	3	3
Glazing - weight	Strain of neck, limbs or back. Fall from height.	Contractors	3	5	15	Provide sufficient manpower, lifting gear and structural support	1	5	5

L: Likelihood S: Severity R: Rating

Appendix F - Graphs and Site Plans

Novartis Site, Horsham - Phase 3

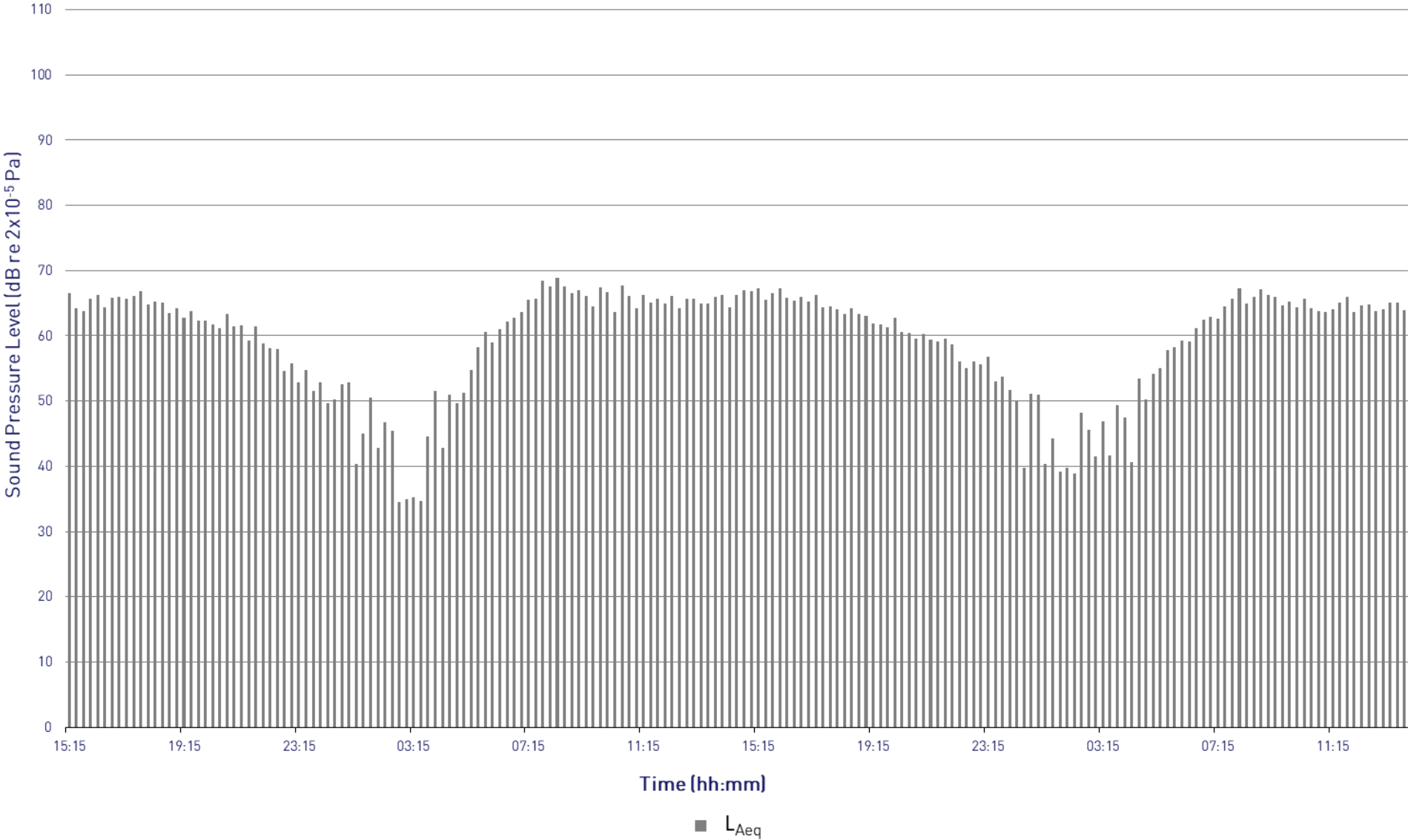
L_{Aeq} Time History

Measurement Position 1 - Parsonage Road



Project: 14076

Graph 5



Novartis Site, Horsham - Phase 3

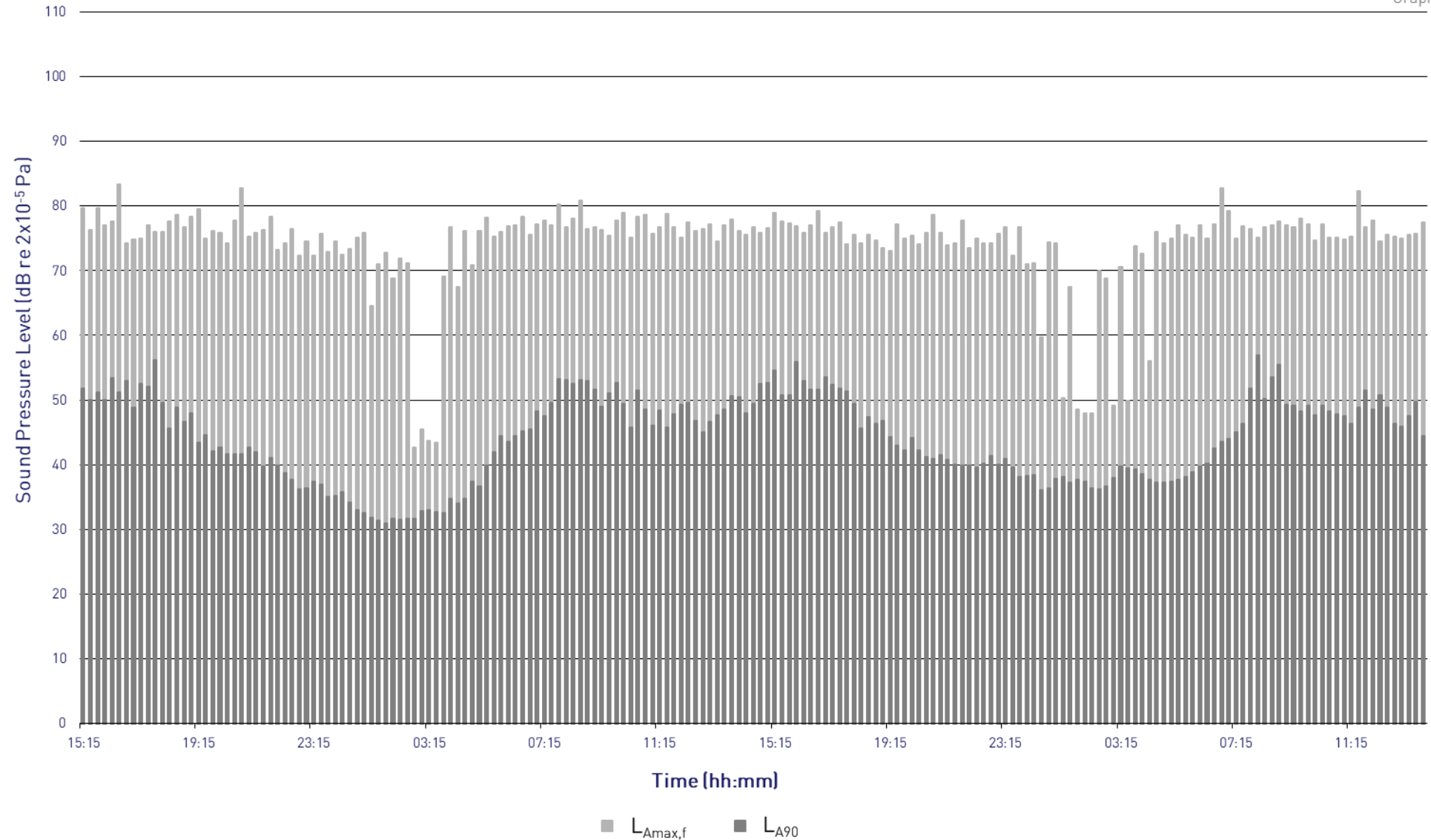
$L_{Amax,f}$ and L_{A90} Time History

Measurement Position 1 - Parsonage Road



Project: 14076

Graph 6



Novartis Site, Horsham - Phase 3

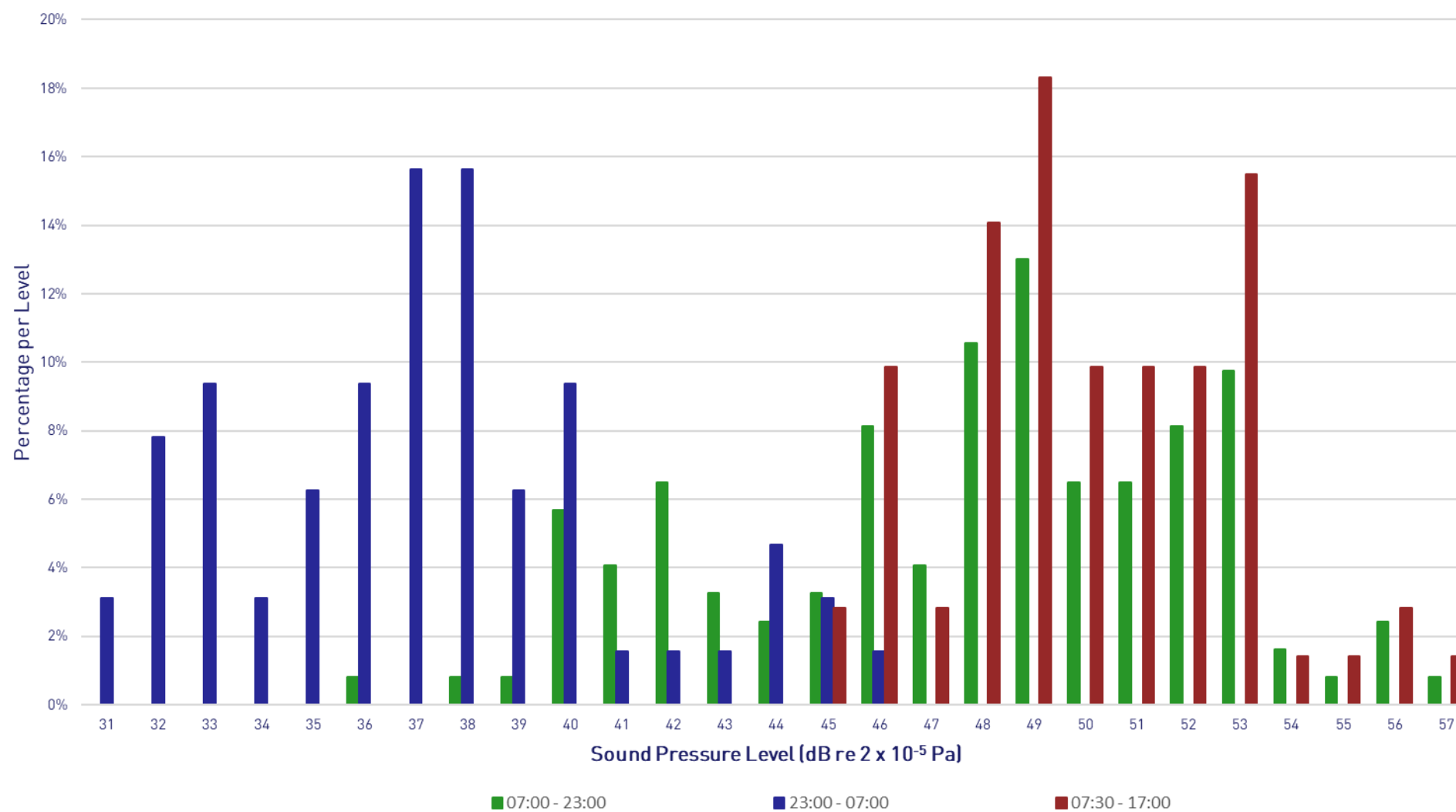
L_{A90,15 minutes} Histogram

Measurement Position 1 - Parsonage Road



Project: 14076

Graph 7



Novartis Site, Horsham - Phase 3

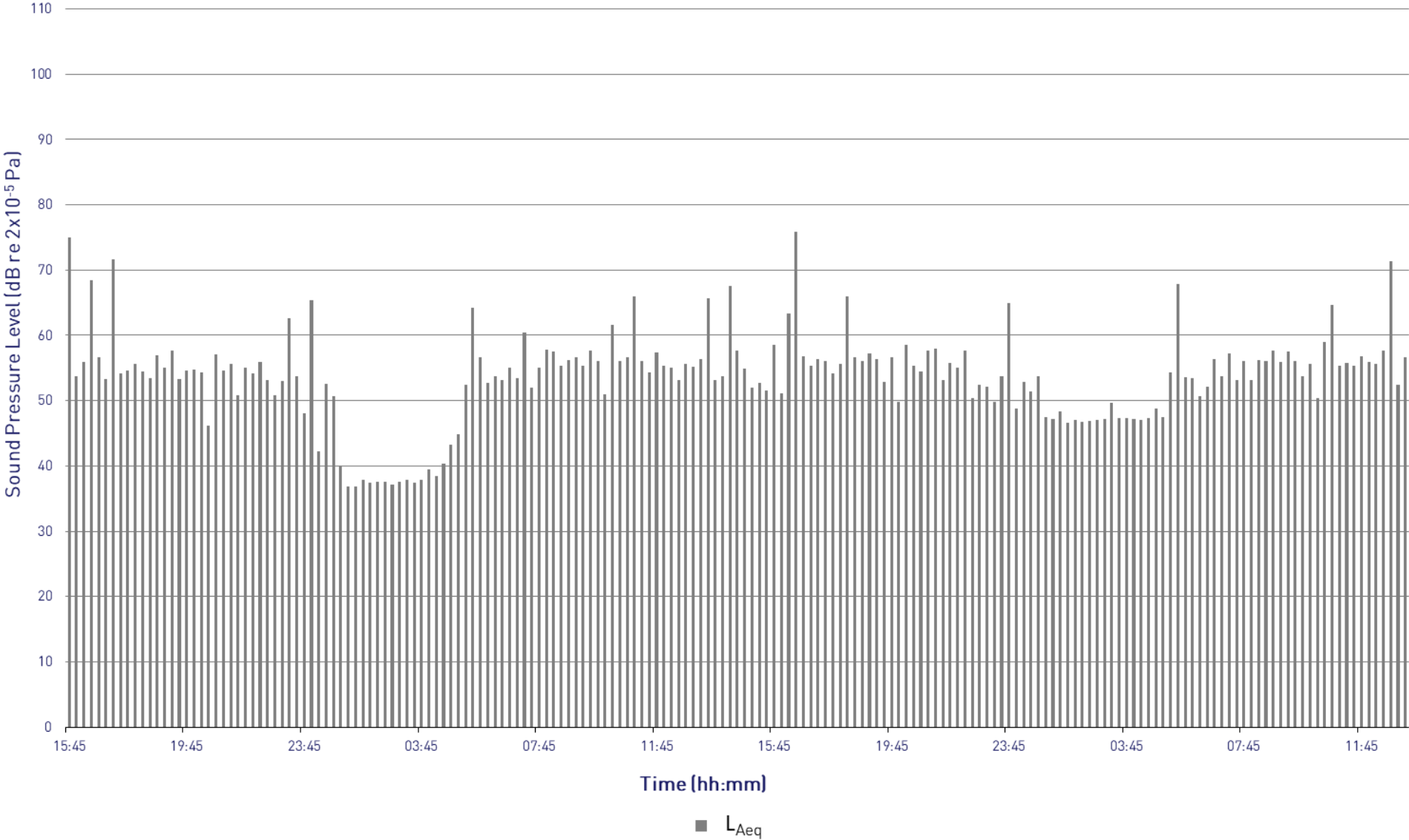
L_{Aeq} Time History

Measurement Position 2 - East Railway Line



Project: 14076

Graph 8



Novartis Site, Horsham - Phase 3

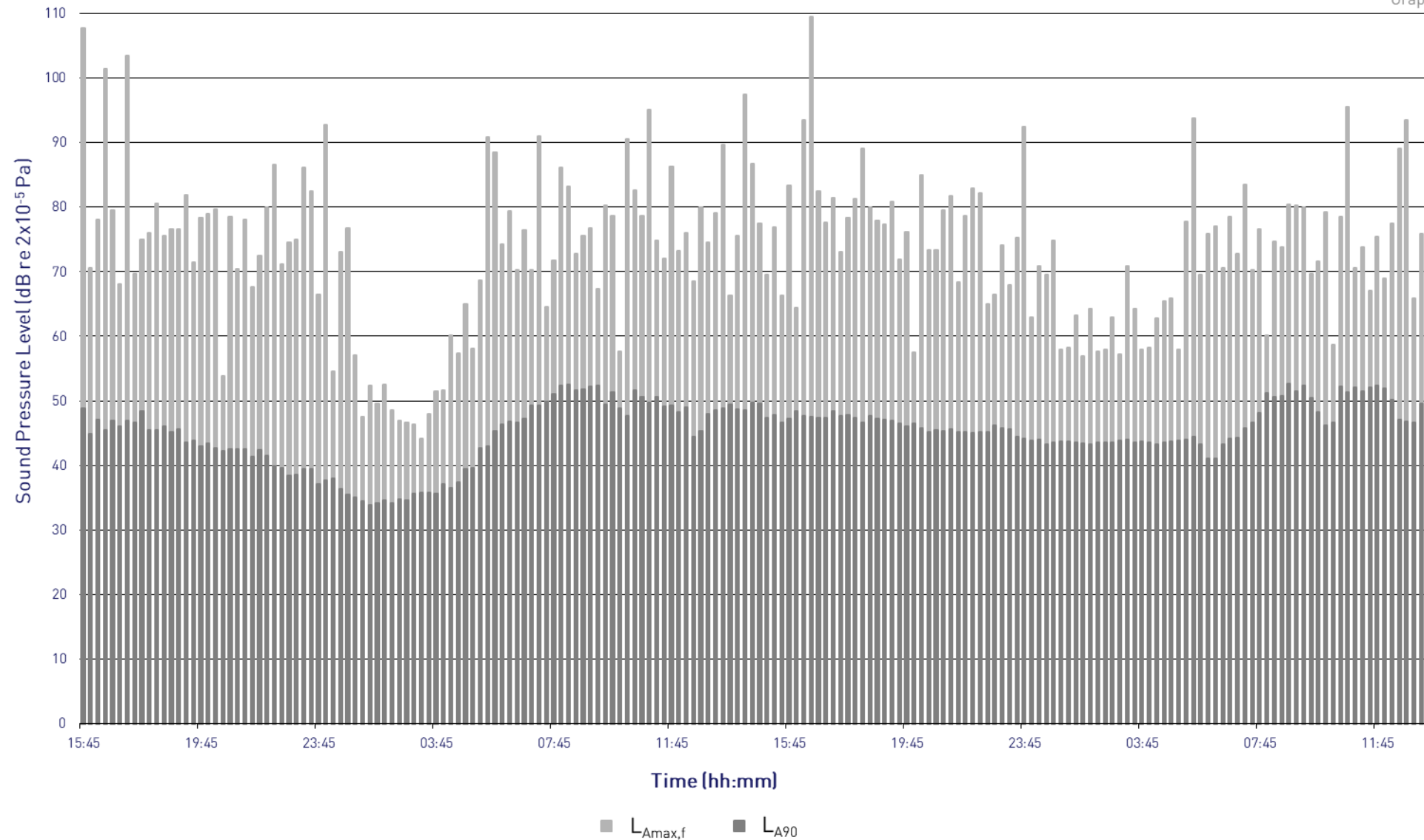
$L_{Amax,f}$ and L_{A90} Time History

Measurement Position 2 - East Railway Line



Project: 14076

Graph 9



Novartis Site, Horsham - Phase 3

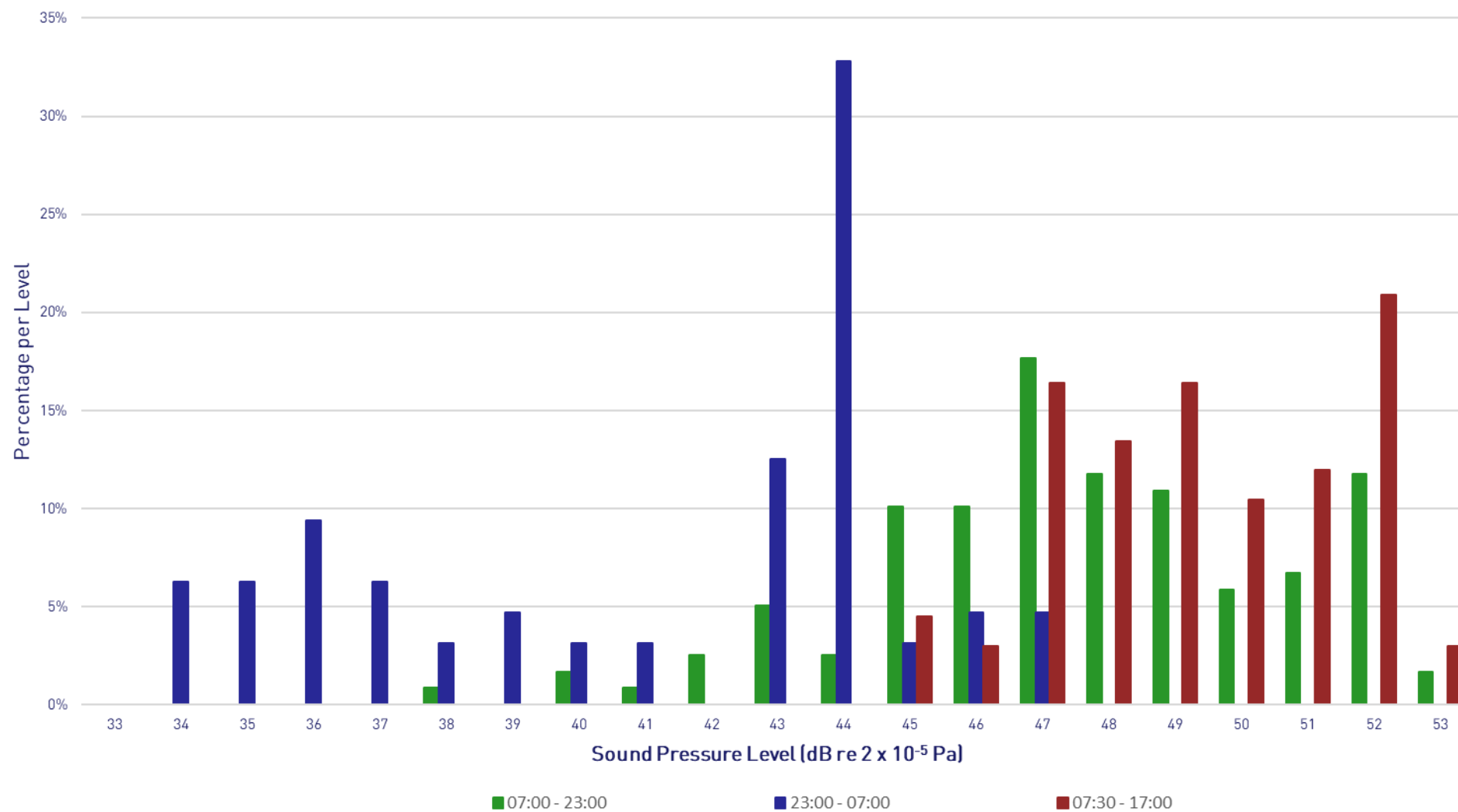
$L_{A90,15 \text{ minutes}}$ Histogram

Measurement Position 2 - East Railway Line



Project: 14076

Graph 10



Novartis Site, Horsham - Phase 3

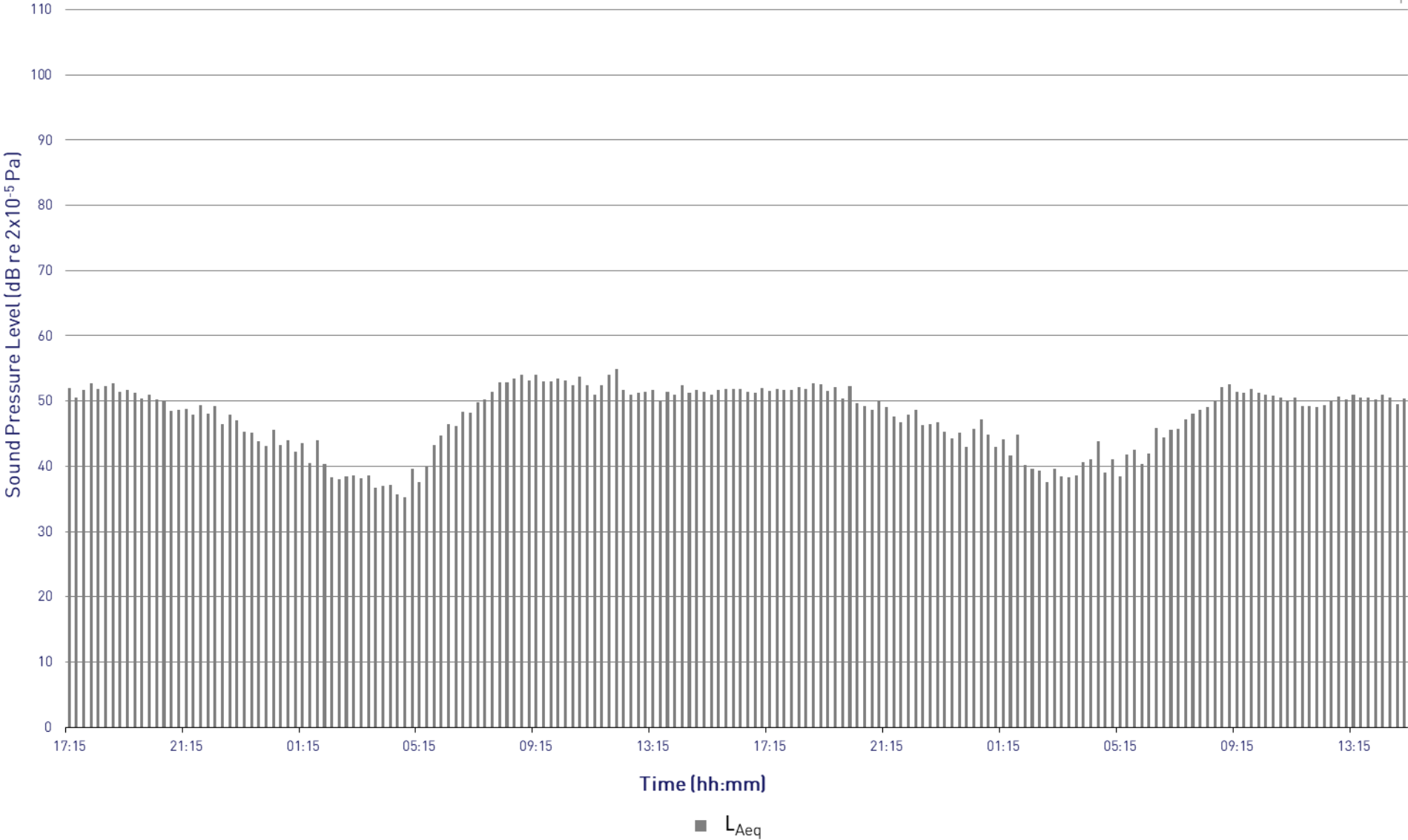
L_{Aeq} Time History

Measurement Position 3 - Centre of Site



Project: 14076

Graph 11



Novartis Site, Horsham - Phase 3

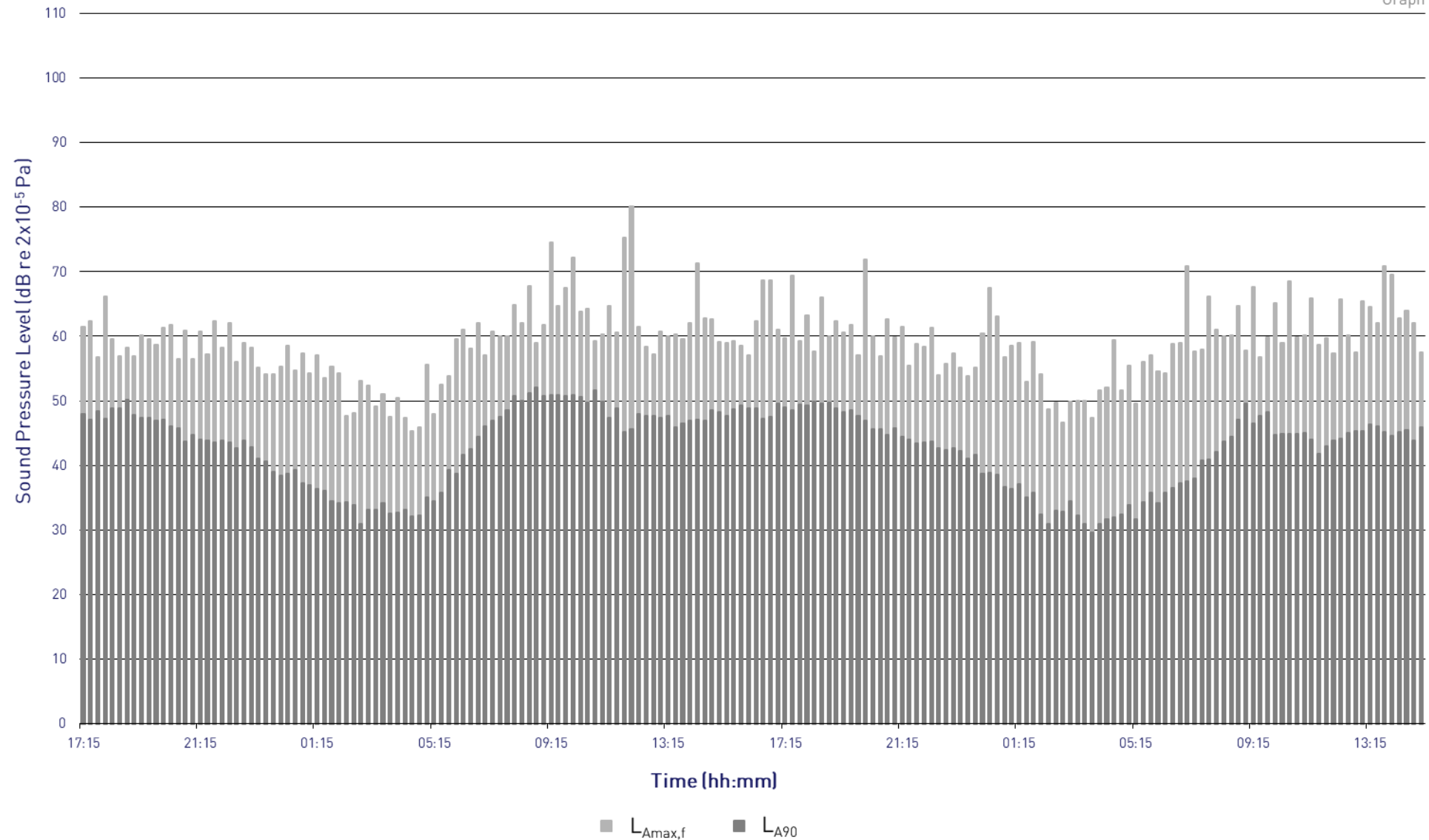
$L_{Amax,f}$ and L_{A90} Time History

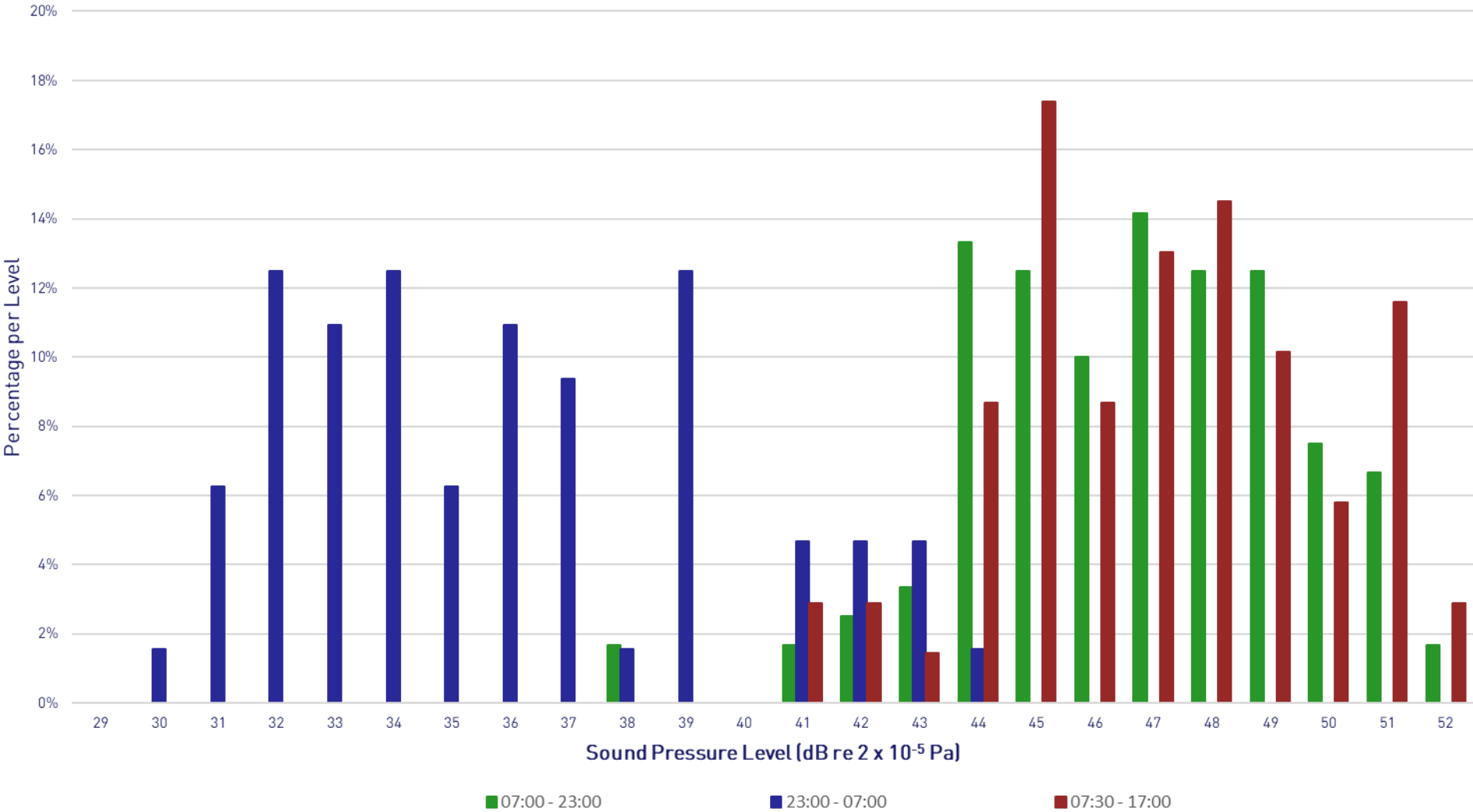
Measurement Position 3 - Centre of Site



Project: 14076

Graph 12





Former Novartis Site - Phase 3

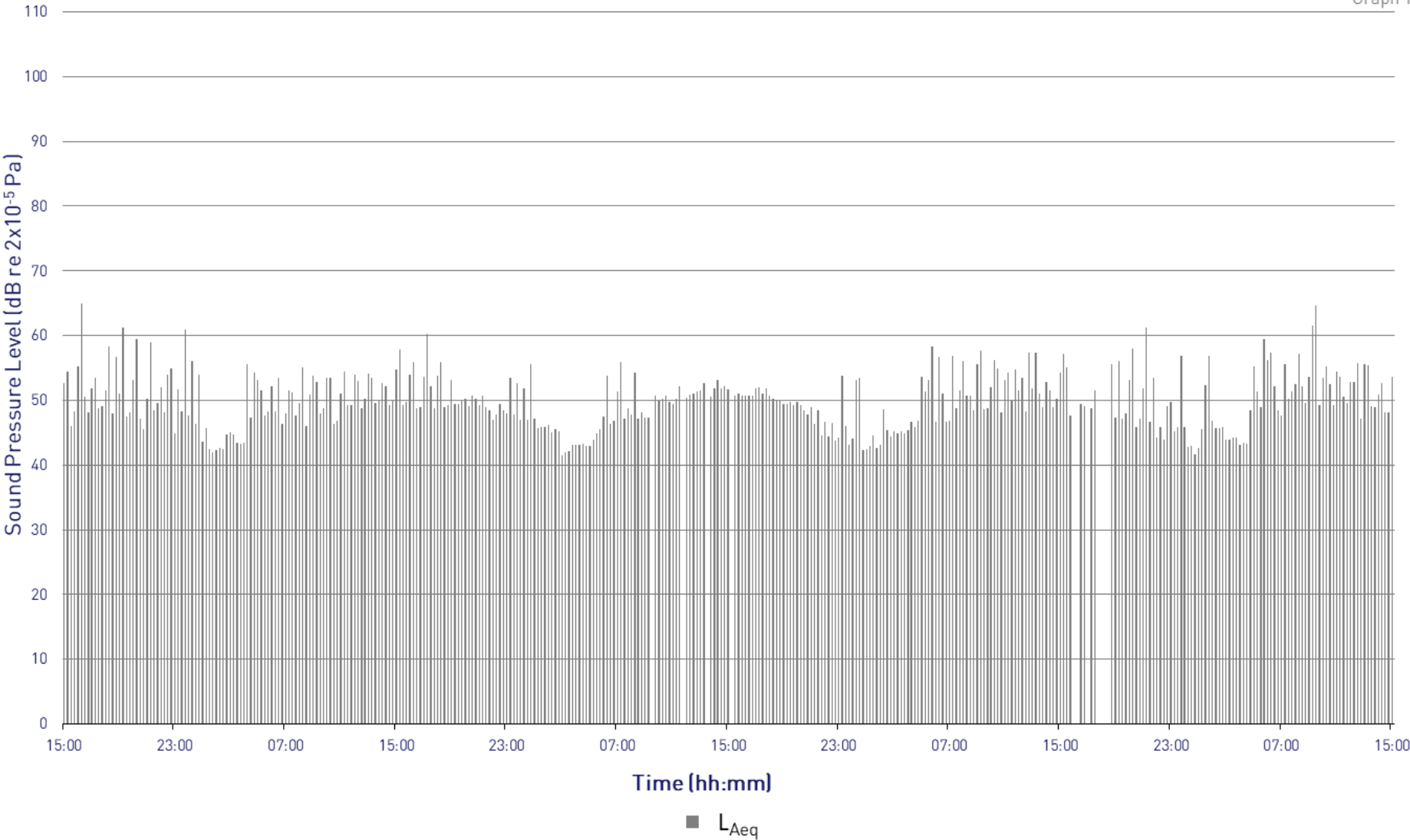
L_{Aeq} Time History

Measurement Position 4 - South Railway Line Sidings



Project: 14076

Graph 14



Former Novartis Site - Phase 3

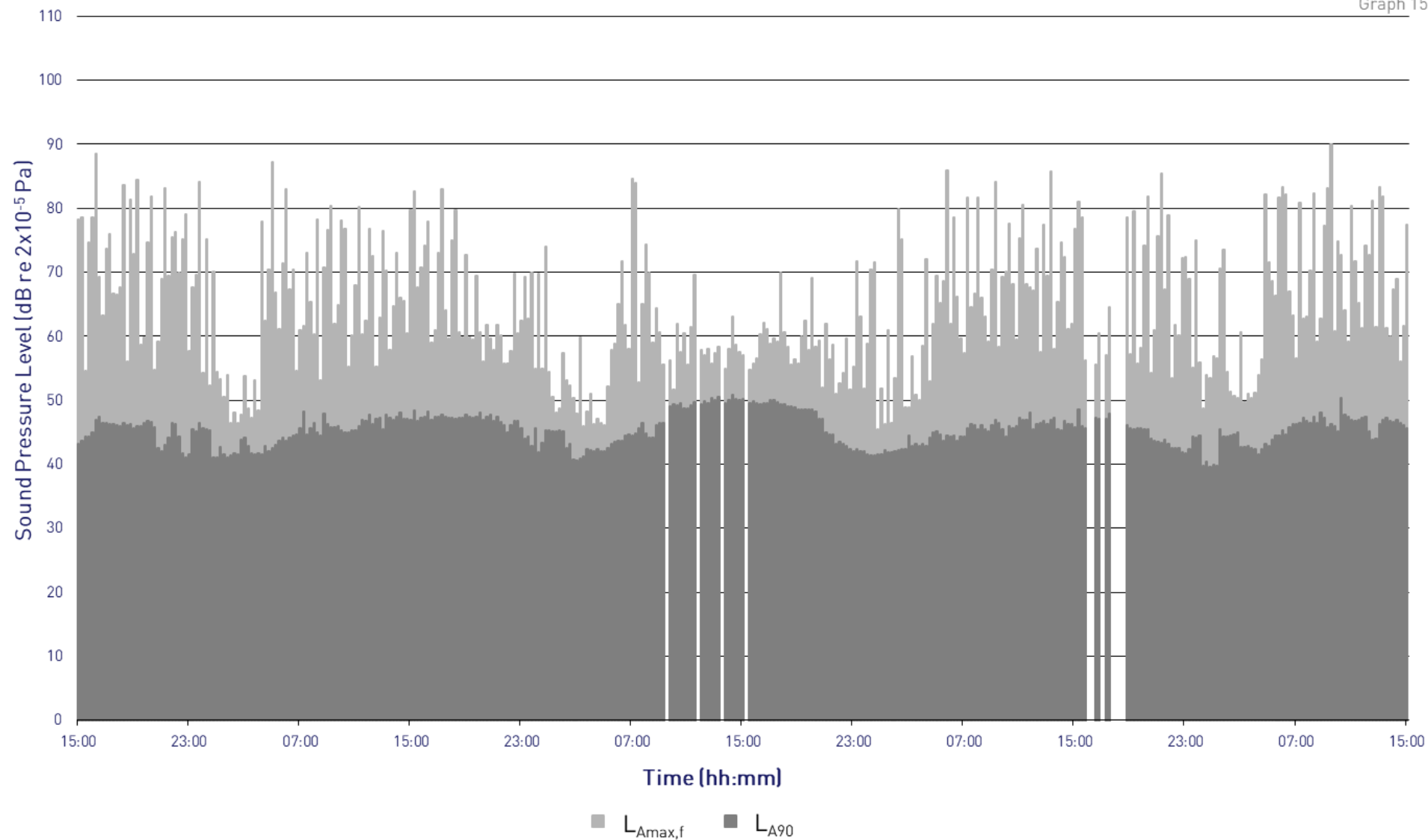
$L_{Amax,f}$ and L_{A90} Time History

Measurement Position 4 - South Railway Line Sidings



Project: 14076

Graph 15



Former Novartis Site - Phase 3

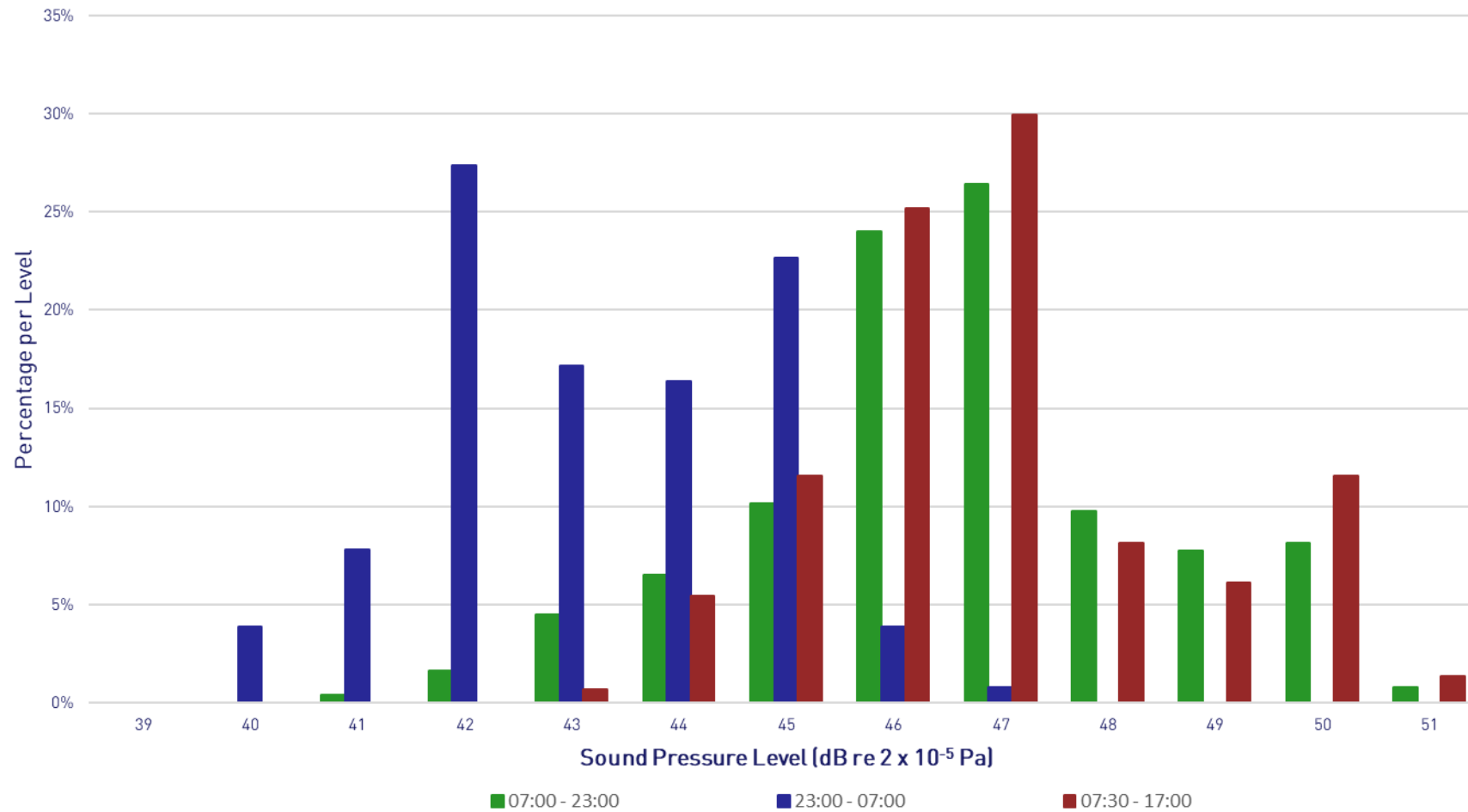
$L_{A90,15\text{ minutes}}$ Histogram

Measurement Position 4 - South Railway Line Sidings



Project: 14076

Graph 16



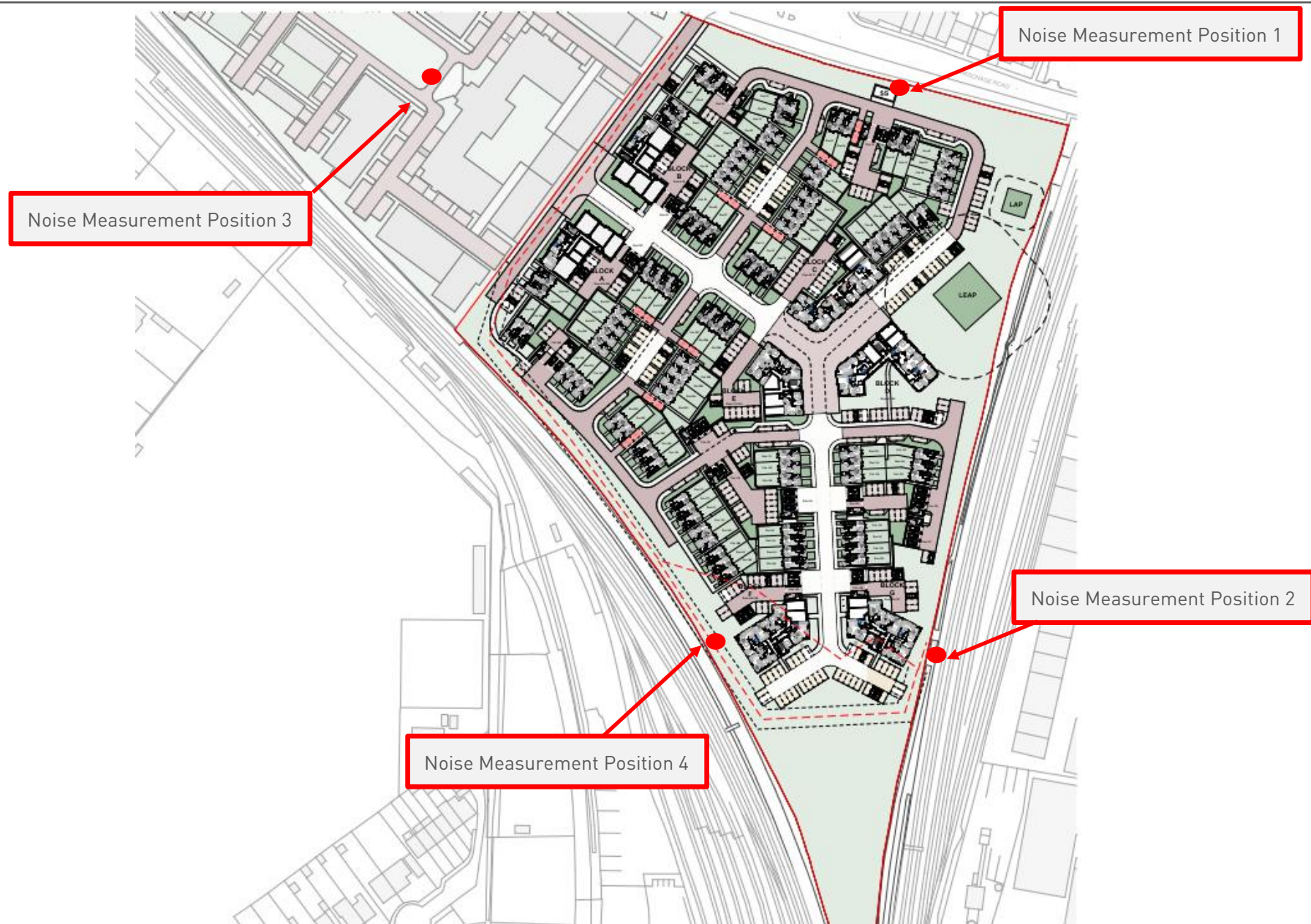


Figure 1 – Site Plan showing Measurement Locations

Former Novartis Site, Horsham – Phase 3

Project 15998

17 August 2026

Not to Scale



Figure 2 – Photo Showing Measurement Position 1

Former Novartis Site, Horsham – Phase 3

Project 15998

17 August 2026

Not to Scale





Figure 3 – Photo Showing Measurement Position 2

Former Novartis Site, Horsham – Phase 3

Project 15998

17 August 2026

Not to Scale



Figure 4 – Photo Showing Measurement Position 3

Former Novartis Site, Horsham – Phase 3

Project 15998

17 August 2026

Not to Scale





Figure 5 – Photo Showing Measurement Position 4

Former Novartis Site, Horsham – Phase 3

Project 15998

17 August 2026

Not to Scale



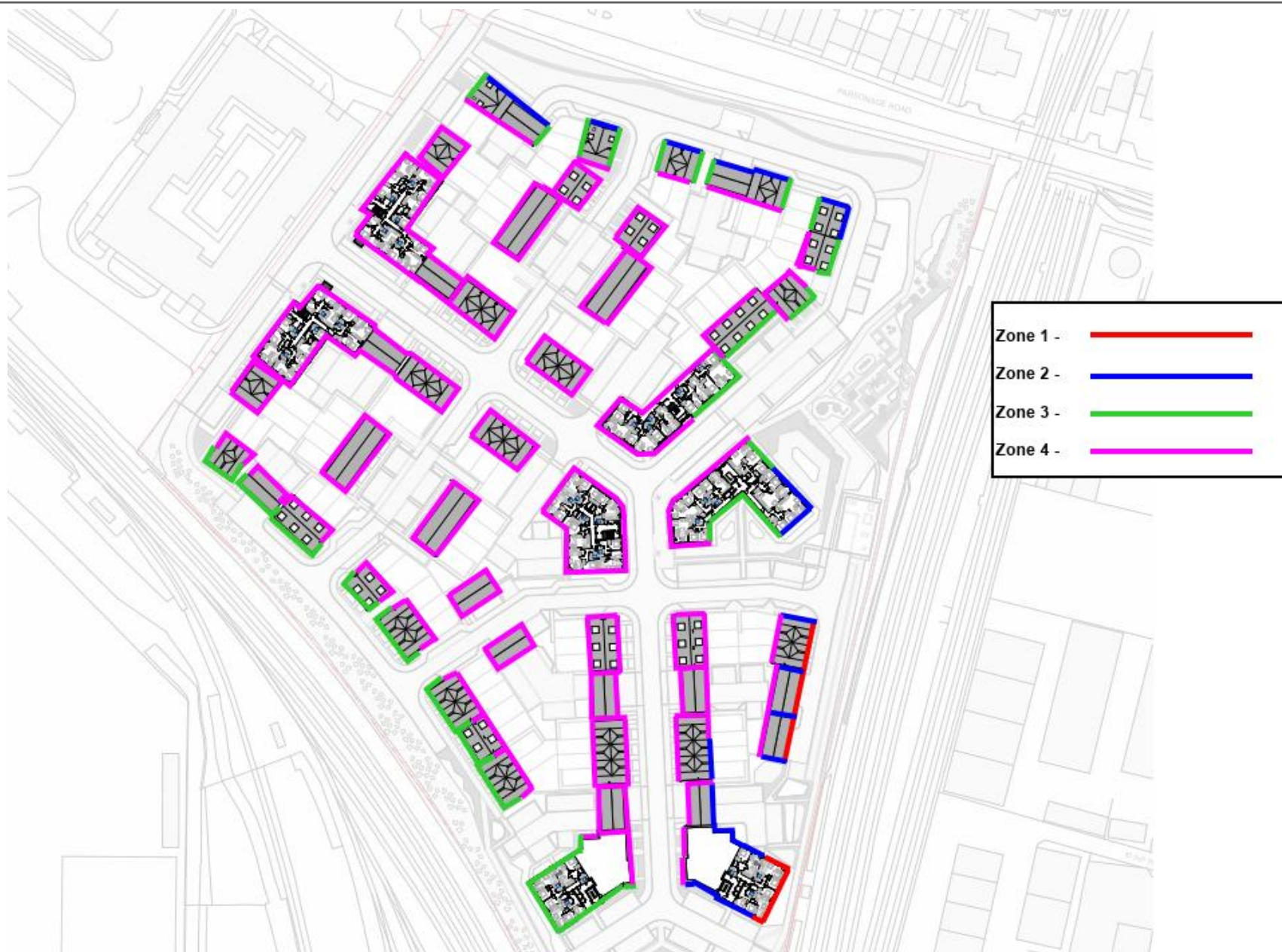


Figure 6 – Façade Zoning Plan

Former Novartis Site, Horsham – Phase 3

Project 15998

17 August 2026

Not to Scale

Appendix G – Waterstone Overheating Report



Waterstone Design

Horsham – Novartis Site Overheating Report

Job No: D2700 – Novartis Site – Horsham Enterprise Park

Date 14th August 2026

Rev: REV3





Revision	Date	Comments	Author	Checked
REV1	21/01/2026	First Issue	ES	JE
REV2	03/07/2026	Second Issue	ES	JE
REV3	14/08/2026	Amendments to window openings affecting the results	ES	JE

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1. Executive Summary

Waterstone Design have undertaken an overheating assessment for Lovell for the proposed development at Horsham, Novartis Site to identify whether the dwellings are at a significant risk of overheating as well demonstrating compliance with TM59 & Approved Document O.

This report summaries the process undertaken and outlines the results of the thermal comfort analysis whilst describing any passive measures which may be required to ensure all spaces maintain acceptable levels of thermal comfort. The assessment uses profiles and schedules which are in line with CIBSE guidance TM52:2013 & TM59:2017. To achieve compliance, dwellings must pass both of the below criteria:

- *For living rooms, kitchens and bedrooms: the number of hours during which DT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM52 Criterion 1: Hours of exceedance).*
- *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 annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail).*

After thorough analysis of all house types and orientation, along with façade amendments, the following approach has been implemented to demonstrate compliance with TM59 and Approved Document O, as well as satisfy the security and acoustic restraints:

- The incorporation of passive design measures to manage solar gain such as cross-ventilation where applicable, the thermal mass of internal building elements and glazing g-value set to 0.40.
- Natural ventilation has been provided to all areas through side hung openable windows—excluding ground floor apartments which have restricted openings due to security risks.
- Houses to benefit from decentralised mechanical extract ventilation (dMEV) to wet rooms – installed in line with Part F.
- Apartments to benefit from Mechanical Ventilation with Heat Recovery (MVHR) System – installed in line with Part F.
- The modelling has been conducted using weather data for London Gatwick – Design Summer Year 1 (DSY1 – 2020, high emission, 50% percentile scenario).

The results of the ADO (Overheating) Noise Assessment by RBA Acoustics indicate there are windows on certain façade with limited openings to mitigate noise levels in line with Part O guidance. Also, windows on the ground floor units will require to be fixed overnight due to security issues.



2. Introduction

To reduce the risk of overheating and reliance on cooling measures such as air conditioning, the development has been designed in accordance with new guidance released as part of Approved Document O (Overheating) 2021 edition due to transitional arrangements for the scheme to ensure the strategy for reducing overheating risk is acceptable. This is outlined below:

Limiting solar gains

Solar gains in summer should be limited by any of the following means.

- a. Fixed shading devices, comprising any of the following.
 - i. Shutters
 - ii. External blinds
 - iii. Overhangs
 - iv. Awnings
- b. Glazing design, involving any of the
 - i. Size
 - ii. Orientation
 - iii. g-value
 - iv. Depth of the window reveal.
- c. Building design – for example, the placement of balconies.
- d. Shading provided by adjacent permanent buildings, structures, or landscaping.

Although internal blinds and curtains provide some reduction in solar gains, they should not be taken into account when considering whether requirement O1 has been met.

Foliage, such as tree cover, can provide some reduction in solar gains. However, it should not be taken into account when considering whether requirement O1 has been met.

Removing excess heat

Excess heat should be removed from the residential building by any of the following means.

- a. Opening windows (the effectiveness of this method is improved by cross-ventilation).
- b. Ventilation louvres in external walls.
- c. A mechanical ventilation system.
- d. A mechanical cooling system

The building should be constructed to meet requirement O1 using passive means as far as reasonably practicable.

It should be demonstrated to the building control body that all practicable passive means of limiting unwanted solar gains and removing excess heat have been used first before adopting mechanical cooling.

Any mechanical cooling (air-conditioning) is expected to be used only where requirement O1 cannot be met using openings.



3. CIBSE TM52 Overheating Criteria – Adaptive Thermal Comfort

Historically, overheating in buildings has been quantified by the number of hours per year that the indoor temperature exceeds a particular temperature regardless of what the external temperature may be. However, studies have demonstrated that comfortable room temperatures vary subject to the external air temperature. Occupants are more likely to be 'comfortable' at higher room temperatures during periods of prolonged warmer weather. This is known as Adaptive Thermal Comfort.

In response to this CIBSE produced Technical Memorandum 52 (TM52) "The limits of thermal comfort: avoiding overheating in European buildings" which provides a methodology for assessment of Adaptive Thermal Comfort.

The TM52 assessment is based on the comparison of predicted room temperature with a maximum acceptable room temperature derived from the running mean of the outdoor temperature. The running mean used, places greater weight on the temperature for days closer to the present as these have more influence on a person's perceived comfort levels.

TM52 assesses thermal comfort based upon three criteria, with a 'pass' being dependent upon at least two of the three criteria being met. The three criteria are described below:

1. Hours of Exceedance

This criterion assesses the number of hours (H_e) during which the temperature difference (between actual operative temperature and maximum allowed temperature) is greater than or equal to one degree during the period of May to September inclusive shall not be more than 3% of occupied hours.

Threshold temperature exceeded by one degree $\leq$ 3% of occupied hours

2. Daily Weighted Exceedance

This criterion assesses the severity of overheating, the weighted exceedance (W_e) shall be less than or equal to 6 degree-hours in any one day.

Daily weighted exceedance (degree-hours) $\leq$ 6

3. Upper Limit Temperature

Criterion 3 sets an absolute maximum threshold for the indoor operative temperature for which the temperature difference between indoor operative temperature and maximum allowed temperature shall not exceed four degrees

Temperature $\leq$ upper limit



4. CIBSE TM59 Overheating Criteria - Adaptive Thermal Comfort

Homes that are predominantly naturally ventilated, including homes that have mechanical ventilation with heat recovery (MVHR), with good opportunities for natural ventilation in the summer should assess overheating using the adaptive method based on CIBSE TM52 (2013), as described in section 1 below.

In order to allow the occupants to 'adapt', each habitable room needs operable windows with a minimum free area that satisfies the purge ventilation criteria set in Part F of the Building Regulations, i.e. the window opening area should be at least 1/20th of the floor area of the room (different conditions exist for windows with restricted openings, and the same requirement applies for external doors). Control of overheating may require accessible, secure, quiet ventilation with a significant openable area.

Homes that are predominantly mechanically ventilated because they have either no opportunity or extremely limited opportunities for opening windows (e.g. due to noise levels or air quality) should be assessed for overheating using the fixed temperature method based on CIBSE Guide A (2015a), as described in section 2 below.

1. Criteria for homes predominantly naturally ventilated

Compliance is based on passing both of the following two criteria:

- (a) *For living rooms, kitchens and bedrooms: the number of hours during which DT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM52 Criterion 1: Hours of exceedance).*
- (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 annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail).*

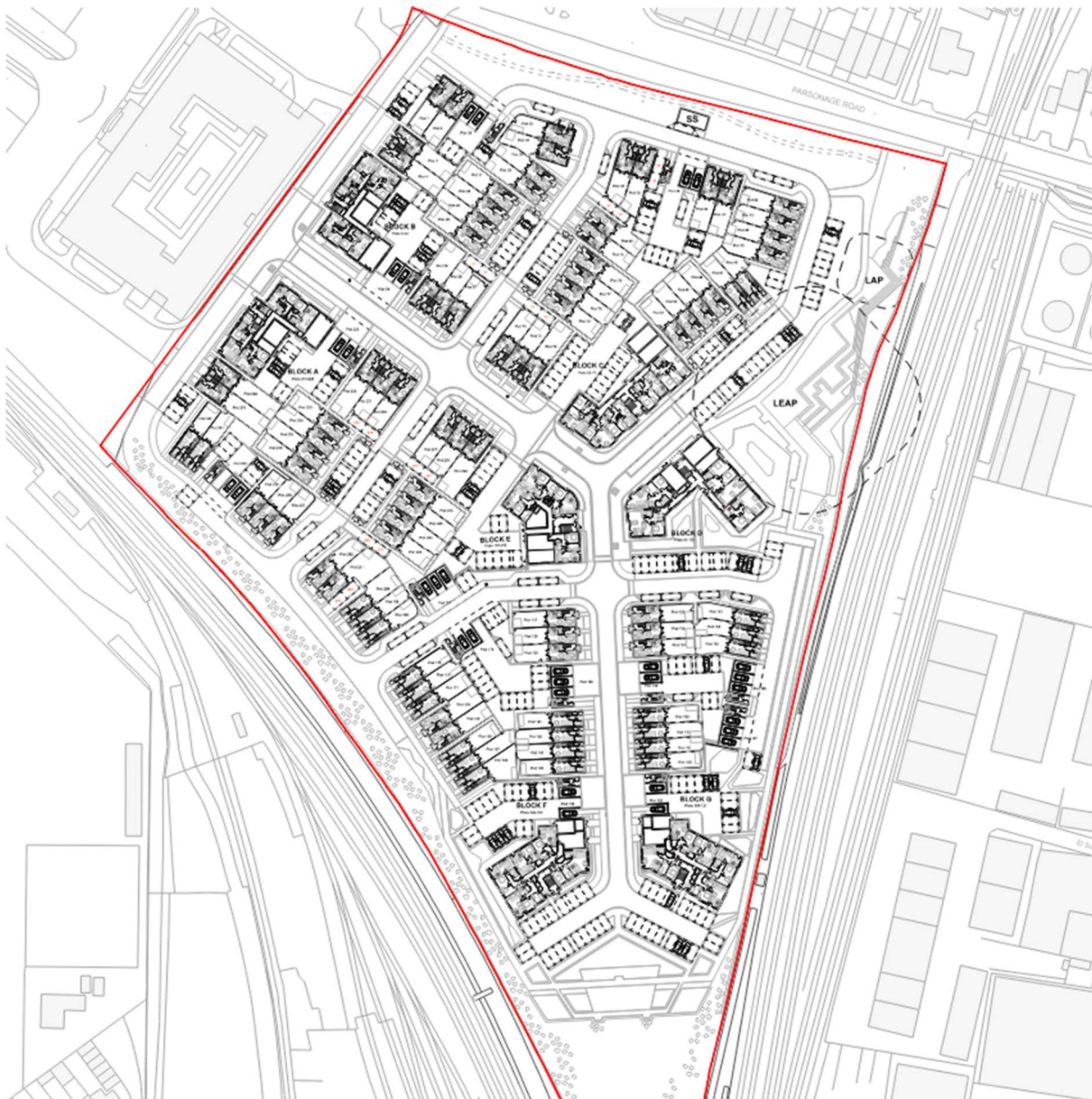
Criteria 2 and 3 of CIBSE TM52 may fail to be met, but both (a) and (b) above must be passed for all relevant rooms.

2. Criteria for homes predominantly mechanically ventilated

For homes with restricted window openings, the CIBSE fixed temperature test must be followed, i.e. all occupied rooms should not exceed an operative temperature of 26 °C for more than 3% of the annual occupied annual hours.

5. Detailed Site Analysis

All dwellings are subject to Approved Document O regulations. For this report, all house and apartment types have been assessed at their respective orientations to ensure all dwellings are accurate and compliant with Part O regulations.



6. Modelling

The models for each dwelling have been created using Design Builder v7.3.1.003 which utilises the EnergyPlus simulation calculation engine. This software has been used as it allows the simulations to adopt 'Approved Document O rules' which incorporates updated scripting to coincide with temperature variables listed in AD-O. The analysis was conducted by a qualified and competent person who has undertaken a relevant course to enable them to carry out assessments in the Design Builder software.

In terms of the modelling, all house types on the development parcel have been assessed for regulation compliance due to varying factors such as single aspect, have large areas of glazing or a combination of each of these. Furthermore, it should be noted that after initial testing, the 'worst case' orientation for each dwelling type has been calculated which is typically between south and south-west facing due to the increased solar gain at the warmest part of the day. As mentioned above, every type has been modelled to ensure that a thorough analysis has been completed.

7. Development Features

7.1 Building Fabric

The following building elements have been assumed as per the fabric specification for Part L 2021. The U-Values, thermal mass and g-values have been modelled as follows.

Element	U-Value (W/m ² K)
Ground Floor	0.12
External Wall (Houses)	0.18
External Wall (Flats)	0.14
Separating Wall	0.18
Sloped Roof	0.10
Flat Roof (Houses)	0.16
Flat Roof (Flats)	0.10
Windows (Houses)	1.1 (0.40 g-value)
Windows (Flats)	0.8 (0.40 g-value)
Doors	Glazed – 1.2 Entry Door – 1.4
Air Permeability (Houses)	4 m ³ /hr.m ² @50Pa.
Air Permeability (Flats)	3 m ³ /hr.m ² @50Pa.



7.2 Natural Ventilation

Natural ventilation is to be provided by means of openable windows where applicable which is an effective way to mitigate overheating as this delivers fresh air to the occupants. It should be noted that ventilation air change rates have been calculated by EnergyPlus utilising the detailed calculation, and wind speed/orientation data from the weather data files which allows calculation of air change rates for the given site location.

It has been scheduled that the occupants will be able to open any applicable windows during hot weather when internal temperatures are in line with Section 2 of Approved Document O:

- a. When a room is occupied during the day (8am to 11pm), openings should be modelled to do all of the following.
 - i. Start to open when the internal temperature exceeds 22°C.
 - ii. Be fully open when the internal temperature exceeds 26°C.
 - iii. Start to close when the internal temperature falls below 26°C.
 - iv. Be fully closed when the internal temperature falls below 22°C.
- b. At night (11pm to 8am), openings should be modelled as fully open if both of the following apply
 - i. The opening is on the first floor or above and not easily accessible.
 - ii. The internal temperature exceeds 23°C at 11pm.

The free aperture of the windows has been calculated in accordance with the current elevational drawings. To calculate equivalent area, the discharge coefficient calculator as per Appendix D of Approved Document O has been utilised with further modelling undertaken to determine precise aperture alongside window opening angles which can be seen below.

It should be noted that the equivalent area calculations have been modelled to ensure the overheating mitigation strategy is usable to coincide with Section 3 of Approved Document O.

3.9 *Openings that can be opened wider than 100mm may form part of the overheating mitigation strategy where they meet the follow condition:*

- a. *Windows handles on windows the open outwards are not more than 650mm from the inside face of the wall when the window is at its maximum openable angle.*



7.3 Mechanical Ventilation

Mechanical ventilation systems are to be installed in line with Part F regulations to all dwellings providing ventilation as well as extracting humid indoor air.

The ventilation systems have been modelled into the dwellings with a minimum extract rate following Part F regulations for each room activity as below:

- Kitchen – 13 l/s
- Utility Room – 8 l/s
- Bathrooms – 8 l/s
- WC – 6 l/s
- Bedrooms (Apartments Only through MVHR) – l/s varies between each bedroom depending on size of property and minimum rates according to Part F regulations.

7.4 Noise, Pollution or Security Constraints

There are noise and security restraints on the site. The windows in the ground floor bedrooms are not openable during the night-time due to being easily accessible causing security issues for the occupants. Any windows on ground floor level are assumed closed during night-time hours. Multiple houses and blocks have façades deemed to be affected by acoustic restraints due to noise pollutions. The windows for the units affected are also restricted.

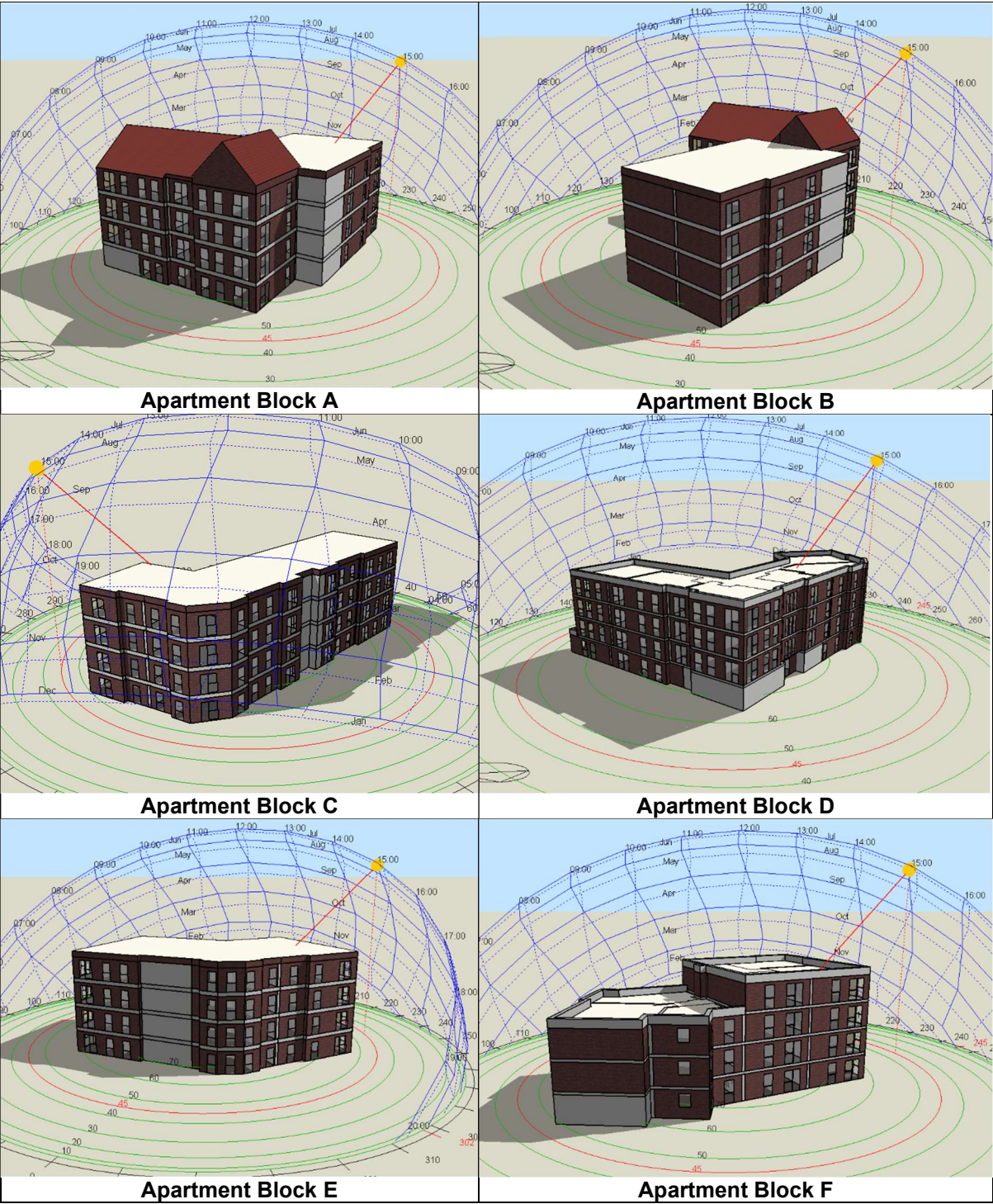
7.5 Internal Doors

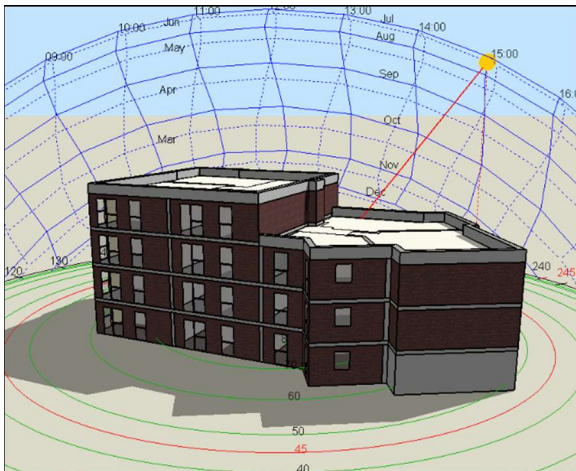
Internal doors have been included and left open in the model in the daytime but are assumed to be closed when the occupants are sleeping as per TM59 assumptions.

7.6 Assumed Occupancy

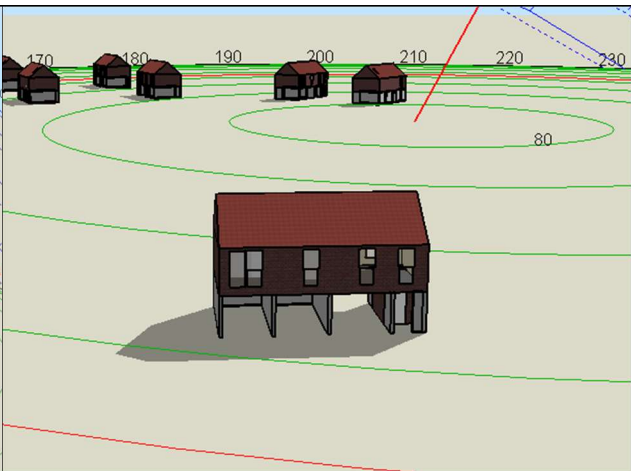
Occupancy levels have been defined by schedules within the software, which have been written in line with the values set out in Figure 1 within CIBSE TM59. This table is attached as Appendix A at the end of this document.

8. 3D Visualisation





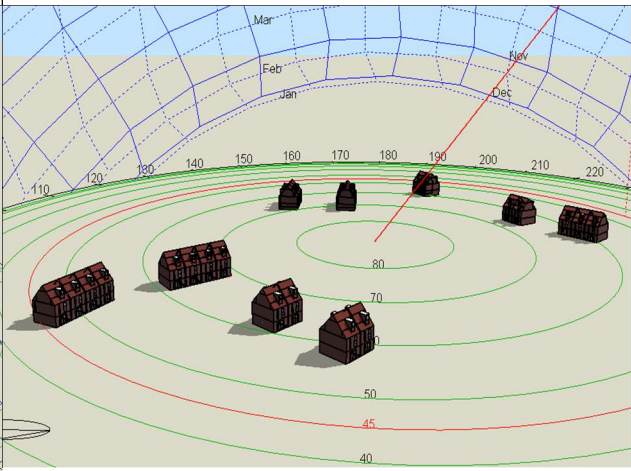
Apartment Block G



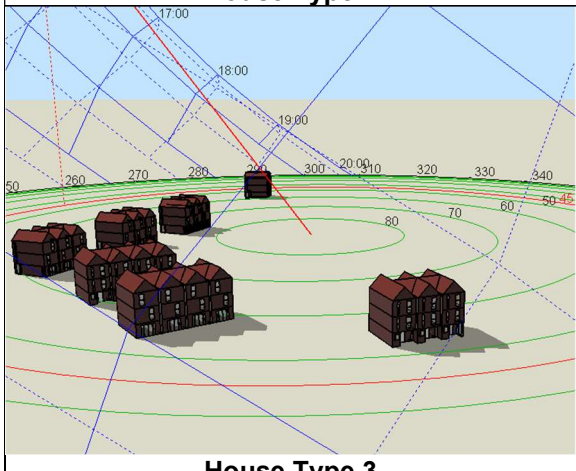
FOG



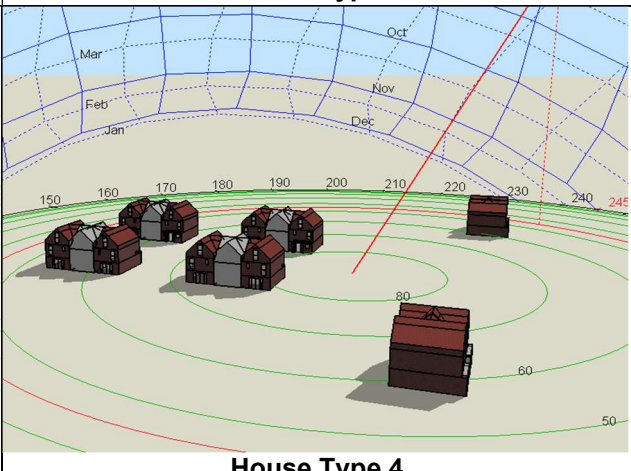
House Type 1



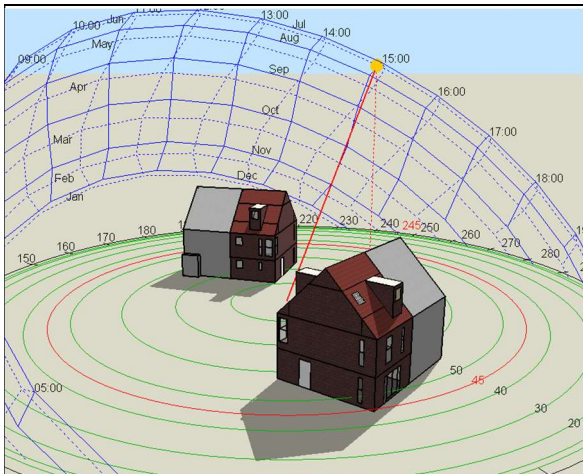
House Type 2



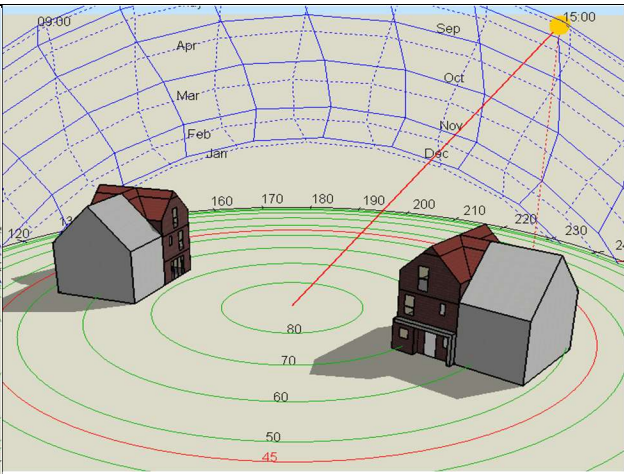
House Type 3



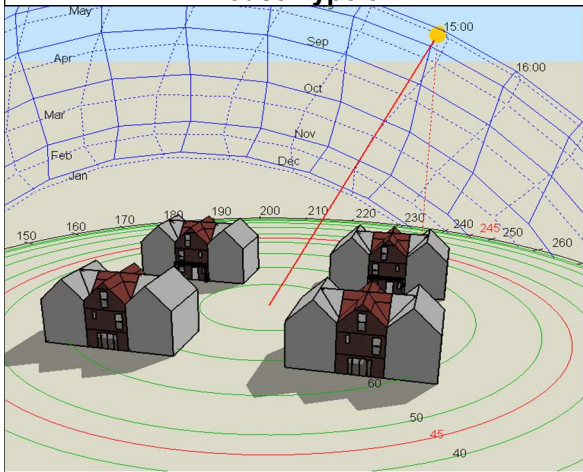
House Type 4



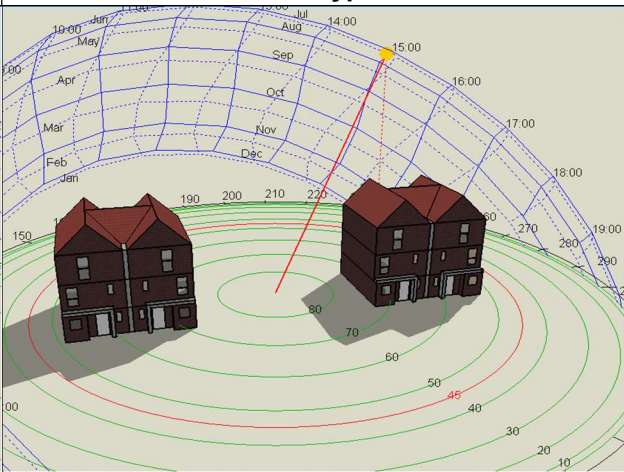
House Type 5



House Type 6



House Type 7



House Type 8



9. Results & Recommendations

The following results demonstrate a summary of for all assessed habitable rooms against the criteria of CIBSE TM59 and Approved Document O. Based on a notional specification, methodology and assumptions outlined within this report, the initial results demonstrated that many of the habitable living spaces were exceeding the stipulated level of thermal comfort as defined by TM59.

In order to address this, measures to reduce the level of overheating have been recommended:

- The incorporation of passive design measures to manage solar gain such as cross-ventilation where applicable, the thermal mass of internal building elements and glazing g-value set to 0.40.
- Natural ventilation has been provided to all areas through side hung openable windows—excluding ground floor apartments which have restricted openings due to security risks.
- Houses to benefit from decentralised mechanical extract ventilation (dMEV) to wet rooms – installed in line with Part F.
- Apartments to benefit from Mechanical Ventilation with Heat Recovery (MVHR) System – installed in line with Part F.
- The modelling has been conducted using weather data for London Gatwick – Design Summer Year 1 (DSY1 – 2020, high emission, 50% percentile scenario).

The results of the ADO (Overheating) Noise Assessment by RBA Acoustics indicate there are windows on certain façade with limited openings to mitigate noise levels in line with Part O guidance. Also, windows on the ground floor units will require to be fixed overnight due to security issues.

9.1 Apartment and House Types Results

Block A

Criteria for predominantly naturally ventilated home				
Block A	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 210	BEDROOM	0.21	7.17	Pass
PLOT 210	KLD	0.81	N/A	Pass
PLOT 211	BEDROOM	0.16	3.83	Pass
PLOT 211	KLD	0.26	N/A	Pass
PLOT 212	BEDROOM1	0.38	8.00	Pass
PLOT 212	BEDROOM2	0.41	1.33	Pass
PLOT 212	KLD	0.72	N/A	Pass
PLOT 213	BEDROOM1	0.11	8.67	Pass
PLOT 213	BEDROOM2	0.14	7.67	Pass
PLOT 213	KLD	0.53	N/A	Pass
PLOT 214	BEDROOM1	0.38	4.00	Pass
PLOT 214	BEDROOM2	0.15	9.33	Pass
PLOT 214	BEDROOM3	0.21	6.17	Pass
PLOT 214	KLD	0.38	N/A	Pass
PLOT 215	BEDROOM1	0.27	7.33	Pass
PLOT 215	BEDROOM2	0.19	7.17	Pass
PLOT 215	BEDROOM3	0.27	9.00	Pass
PLOT 215	KLD	0.40	N/A	Pass
PLOT 216	BEDROOM	0.21	7.00	Pass
PLOT 216	KLD	1.35	N/A	Pass
PLOT 217	BEDROOM1	0.37	8.67	Pass
PLOT 217	BEDROOM2	0.40	11.50	Pass
PLOT 217	KLD	0.81	N/A	Pass
PLOT 218	BEDROOM1	0.15	6.17	Pass
PLOT 218	BEDROOM2	0.12	9.33	Pass
PLOT 218	KLD	0.53	N/A	Pass
PLOT 219	BEDROOM1	0.38	3.50	Pass
PLOT 219	BEDROOM2	0.17	9.33	Pass
PLOT 219	BEDROOM3	0.21	6.00	Pass
PLOT 219	KLD	0.38	N/A	Pass
PLOT 220	BEDROOM1	0.38	7.67	Pass
PLOT 220	BEDROOM2	0.31	7.00	Pass
PLOT 220	BEDROOM3	0.19	9.33	Pass
PLOT 220	KLD	0.31	N/A	Pass
PLOT 221	BEDROOM	0.40	7.83	Pass
PLOT 221	KLD	0.23	N/A	Pass



Block A Continued

Criteria for predominantly naturally ventilated home				
Block A	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 222	BEDROOM	0.21	7.17	Pass
PLOT 222	KLD	0.81	N/A	Pass
PLOT 222	BEDROOM	0.16	3.83	Pass
PLOT 223	KLD	0.26	N/A	Pass
PLOT 223	BEDROOM1	0.38	8.00	Pass
PLOT 223	BEDROOM2	0.41	1.33	Pass
PLOT 224	KLD	0.72	N/A	Pass
PLOT 224	BEDROOM1	0.11	8.67	Pass
PLOT 224	BEDROOM2	0.14	7.67	Pass
PLOT 224	KLD	0.53	N/A	Pass
PLOT 225	BEDROOM1	0.38	4.00	Pass
PLOT 225	BEDROOM2	0.15	9.33	Pass
PLOT 225	BEDROOM3	0.21	6.17	Pass
PLOT 225	KLD	0.38	N/A	Pass
PLOT 226	BEDROOM1	0.27	7.33	Pass
PLOT 226	BEDROOM2	0.19	7.17	Pass
PLOT 227	BEDROOM3	0.27	9.00	Pass
PLOT 227	KLD	0.40	N/A	Pass
PLOT 227	BEDROOM	0.21	7.00	Pass
PLOT 228	KLD	1.35	N/A	Pass
PLOT 228	BEDROOM1	0.37	8.67	Pass
PLOT 228	BEDROOM2	0.40	11.50	Pass



Block B

Criteria for predominantly naturally ventilated home				
Block B	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 5	BEDROOM	0.60	11.33	Pass
PLOT 5	KLD	0.54	N/A	Pass
PLOT 6	BEDROOM	0.48	7.83	Pass
PLOT 6	KLD	0.60	N/A	Pass
PLOT 7	BEDROOM1	1.54	7.67	Pass
PLOT 7	BEDROOM2	0.48	11.17	Pass
PLOT 7	KLD	0.82	N/A	Pass
PLOT 8	BEDROOM1	0.36	8.50	Pass
PLOT 8	BEDROOM2	0.37	7.50	Pass
PLOT 8	KLD	0.67	N/A	Pass
PLOT 9	BEDROOM1	0.11	6.67	Pass
PLOT 9	BEDROOM2	0.14	11.83	Pass
PLOT 9	BEDROOM3	0.50	11.83	Pass
PLOT 9	KLD	0.93	N/A	Pass
PLOT 10	BEDROOM1	0.35	6.00	Pass
PLOT 10	BEDROOM2	0.84	11.83	Pass
PLOT 10	BEDROOM3	0.77	7.33	Pass
PLOT 10	KLD	0.19	N/A	Pass
PLOT 11	BEDROOM	0.44	7.67	Pass
PLOT 11	KLD	0.19	N/A	Pass
PLOT 12	BEDROOM1	0.90	8.67	Pass
PLOT 12	BEDROOM2	0.21	11.50	Pass
PLOT 12	KLD	1.59	N/A	Pass
PLOT 13	BEDROOM1	0.35	6.17	Pass
PLOT 13	BEDROOM2	0.37	9.17	Pass
PLOT 13	KLD	0.77	N/A	Pass
PLOT 14	BEDROOM1	0.16	6.33	Pass
PLOT 14	BEDROOM2	0.12	11.67	Pass
PLOT 14	BEDROOM3	0.48	11.50	Pass
PLOT 14	KLD	0.91	N/A	Pass
PLOT 15	BEDROOM1	0.33	5.83	Pass
PLOT 15	BEDROOM2	0.82	12.00	Pass
PLOT 15	BEDROOM3	0.76	7.33	Pass
PLOT 15	KLD	0.19	N/A	Pass
PLOT 16	BEDROOM	0.44	8.00	Pass
PLOT 16	KLD	0.19	N/A	Pass



Block B Continued

Criteria for predominantly naturally ventilated home				
Block B	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 17	BEDROOM1	0.34	8.67	Pass
PLOT 17	BEDROOM2	0.33	11.50	Pass
PLOT 17	KLD	0.77	N/A	Pass
PLOT 18	BEDROOM1	0.16	6.17	Pass
PLOT 18	BEDROOM2	0.12	9.17	Pass
PLOT 18	KLD	0.48	N/A	Pass
PLOT 19	BEDROOM1	0.90	6.17	Pass
PLOT 19	BEDROOM2	0.33	11.67	Pass
PLOT 19	BEDROOM3	0.79	10.83	Pass
PLOT 19	KLD	0.74	N/A	Pass
PLOT 20	BEDROOM1	0.19	5.83	Pass
PLOT 20	BEDROOM2	0.44	11.83	Pass
PLOT 20	BEDROOM3	0.19	7.00	Pass
PLOT 20	KLD	0.83	N/A	Pass
PLOT 21	BEDROOM	0.28	8.33	Pass
PLOT 21	KLD	1.70	N/A	Pass
PLOT 22	BEDROOM1	0.34	8.67	Pass
PLOT 22	BEDROOM2	0.33	11.50	Pass
PLOT 22	KLD	0.77	N/A	Pass
PLOT 23	BEDROOM1	0.16	6.17	Pass
PLOT 23	BEDROOM2	0.12	9.17	Pass
PLOT 23	KLD	0.48	N/A	Pass



Block C

Criteria for predominantly naturally ventilated home				
Block C	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 52	BEDROOM1	0.22	11.25	Pass
PLOT 52	BEDROOM2	0.35	10.25	Pass
PLOT 52	KLD	1.21	N/A	Pass
PLOT 53	BEDROOM	0.38	10.75	Pass
PLOT 53	KLD	1.69	N/A	Pass
PLOT 54	BEDROOM1	0.17	5.75	Pass
PLOT 54	BEDROOM2	0.31	9.5	Pass
PLOT 54	KLD	1.38	N/A	Pass
PLOT 55	BEDROOM1	0.41	18.5	Pass
PLOT 55	BEDROOM2	0.24	12.25	Pass
PLOT 55	KLD	0.48	N/A	Pass
PLOT 56	BEDROOM1	0.51	20.75	Pass
PLOT 56	BEDROOM2	0.34	12.25	Pass
PLOT 56	KLD	0.66	N/A	Pass
PLOT 57	BEDROOM1	0.23	12.75	Pass
PLOT 57	BEDROOM2	0.38	11.5	Pass
PLOT 57	KLD	1.51	N/A	Pass
PLOT 58	BEDROOM	0.37	11.75	Pass
PLOT 58	KLD	1.64	N/A	Pass
PLOT 59	BEDROOM1	0.13	5.5	Pass
PLOT 59	BEDROOM2	0.32	11.75	Pass
PLOT 59	KLD	1.52	N/A	Pass
PLOT 60	BEDROOM1	0.48	21.5	Pass
PLOT 60	BEDROOM2	0.38	9.5	Pass
PLOT 60	KLD	0.94	N/A	Pass
PLOT 61	BEDROOM1	0.69	24.25	Pass
PLOT 61	BEDROOM2	0.36	14.5	Pass
PLOT 61	KLD	0.86	N/A	Pass
PLOT 62	BEDROOM1	0.23	12.5	Pass
PLOT 62	BEDROOM2	0.38	11.5	Pass
PLOT 62	KLD	1.51	N/A	Pass
PLOT 63	BEDROOM	0.37	11.75	Pass
PLOT 63	KLD	1.59	N/A	Pass
PLOT 64	BEDROOM1	0.13	5.75	Pass
PLOT 64	BEDROOM2	0.34	12	Pass
PLOT 64	KLD	1.43	N/A	Pass



Block C Continued

Criteria for predominantly naturally ventilated home				
Block C	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 65	BEDROOM1	0.47	20.25	Pass
PLOT 65	BEDROOM2	0.38	10	Pass
PLOT 65	KLD	0.94	N/A	Pass
PLOT 66	BEDROOM1	0.7	24.25	Pass
PLOT 66	BEDROOM2	0.36	14.5	Pass
PLOT 66	KLD	0.86	N/A	Pass
PLOT 67	BEDROOM1	0.23	12.25	Pass
PLOT 67	BEDROOM2	0.38	11.5	Pass
PLOT 67	KLD	1.51	N/A	Pass
PLOT 68	BEDROOM	0.37	11.5	Pass
PLOT 68	KLD	1.54	N/A	Pass
PLOT 69	BEDROOM1	0.15	6.25	Pass
PLOT 69	BEDROOM2	0.35	12	Pass
PLOT 69	KLD	1.42	N/A	Pass
PLOT 70	BEDROOM1	0.45	19.75	Pass
PLOT 70	BEDROOM2	0.38	9.75	Pass
PLOT 70	KLD	0.9	N/A	Pass
PLOT 71	BEDROOM1	0.7	24.25	Pass
PLOT 71	BEDROOM2	0.36	14.5	Pass
PLOT 71	KLD	0.86	N/A	Pass



Block D

Criteria for predominantly naturally ventilated home				
Block D	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 81	BEDROOM1	0.03	8.5	Pass
PLOT 81	BEDROOM2	0.08	10.25	Pass
PLOT 81	KLD	0.31	N/A	Pass
PLOT 82	BEDROOM1	0.57	10.75	Pass
PLOT 82	BEDROOM2	0.42	14.25	Pass
PLOT 82	KLD	0.76	N/A	Pass
PLOT 83	BEDROOM1	0.24	9.5	Pass
PLOT 83	BEDROOM2	0.38	10.5	Pass
PLOT 83	KLD	1.46	N/A	Pass
PLOT 84	BEDROOM1	0.08	6.75	Pass
PLOT 84	BEDROOM2	0.1	6.75	Pass
PLOT 84	KLD	0.63	N/A	Pass
PLOT 85	BEDROOM1	0.21	9.25	Pass
PLOT 85	BEDROOM2	0.21	12.25	Pass
PLOT 85	KLD	0.92	N/A	Pass
PLOT 86	BEDROOM1	0.17	11.75	Pass
PLOT 86	BEDROOM2	0.17	12.5	Pass
PLOT 86	KLD	0.35	N/A	Pass
PLOT 87	BEDROOM1	0.43	9.5	Pass
PLOT 87	BEDROOM2	0.32	16.25	Pass
PLOT 87	KLD	0.8	N/A	Pass
PLOT 88	BEDROOM1	0.34	10.5	Pass
PLOT 88	BEDROOM2	0.41	12.25	Pass
PLOT 88	KLD	1.57	N/A	Pass
PLOT 89	BEDROOM1	0.1	8.25	Pass
PLOT 89	BEDROOM2	0.12	9.25	Pass
PLOT 89	KLD	0.31	N/A	Pass
PLOT 90	BEDROOM	0.1	9.5	Pass
PLOT 90	KLD	0.21	N/A	Pass
PLOT 91	BEDROOM1	0.21	9.25	Pass
PLOT 91	BEDROOM2	0.21	12	Pass
PLOT 91	KLD	0.9	N/A	Pass
PLOT 92	BEDROOM1	0.17	11.75	Pass
PLOT 92	BEDROOM2	0.17	12.25	Pass
PLOT 92	KLD	0.35	N/A	Pass



Block D Continued

Criteria for predominantly naturally ventilated home				
Block D	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 93	BEDROOM1	0.86	12.25	Pass
PLOT 93	BEDROOM2	0.43	22	Pass
PLOT 93	KLD	1.16	N/A	Pass
PLOT 94	BEDROOM1	0.34	10.5	Pass
PLOT 94	BEDROOM2	0.4	12.25	Pass
PLOT 94	KLD	1.55	N/A	Pass
PLOT 95	BEDROOM1	0.11	8.5	Pass
PLOT 95	BEDROOM2	0.13	9.5	Pass
PLOT 95	KLD	0.28	N/A	Pass
PLOT 96	BEDROOM	0.11	9.5	Pass
PLOT 96	KLD	0.22	N/A	Pass
PLOT 97	BEDROOM1	0.21	8.25	Pass
PLOT 97	BEDROOM2	0.21	11	Pass
PLOT 97	KLD	0.93	N/A	Pass
PLOT 98	BEDROOM1	0.17	10.75	Pass
PLOT 98	BEDROOM2	0.18	11.5	Pass
PLOT 98	KLD	0.35	N/A	Pass
PLOT 99	BEDROOM1	0.92	9.5	Pass
PLOT 99	BEDROOM2	0.43	17.75	Pass
PLOT 99	KLD	1.03	N/A	Pass
PLOT 100	BEDROOM1	0.34	9.25	Pass
PLOT 100	BEDROOM2	0.4	11.25	Pass
PLOT 100	KLD	1.55	N/A	Pass
PLOT 101	BEDROOM1	0.12	8	Pass
PLOT 101	BEDROOM2	0.13	8.75	Pass
PLOT 101	KLD	0.28	N/A	Pass
PLOT 102	BEDROOM	0.12	9.5	Pass
PLOT 102	KLD	0.23	N/A	Pass



Block E

Criteria for predominantly naturally ventilated home				
Block E	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 175	BEDROOM1	0.16	9.50	Pass
PLOT 175	BEDROOM2	0.19	9.33	Pass
PLOT 175	KLD	1.14	N/A	Pass
PLOT 176	BEDROOM1	0.42	13.50	Pass
PLOT 176	BEDROOM2	0.48	11.00	Pass
PLOT 176	KLD	1.82	N/A	Pass
PLOT 177	BEDROOM1	0.14	10.00	Pass
PLOT 177	BEDROOM2	0.16	12.17	Pass
PLOT 177	KLD	1.13	N/A	Pass
PLOT 178	BEDROOM	0.16	9.83	Pass
PLOT 178	KLD	0.48	N/A	Pass
PLOT 179	BEDROOM1	0.14	9.33	Pass
PLOT 179	BEDROOM2	0.19	9.67	Pass
PLOT 179	KLD	1.39	N/A	Pass
PLOT 180	BEDROOM	0.30	12.33	Pass
PLOT 180	KLD	1.93	N/A	Pass
PLOT 181	BEDROOM	0.17	10.83	Pass
PLOT 181	KLD	0.65	N/A	Pass
PLOT 182	BEDROOM1	0.56	14.33	Pass
PLOT 182	BEDROOM2	0.62	11.50	Pass
PLOT 182	KLD	2.29	N/A	Pass
PLOT 183	BEDROOM1	0.47	13.00	Pass
PLOT 183	BEDROOM2	0.61	14.50	Pass
PLOT 183	KLD	1.88	N/A	Pass
PLOT 184	BEDROOM	0.39	11.83	Pass
PLOT 184	KLD	0.98	N/A	Pass
PLOT 185	BEDROOM1	0.14	9.33	Pass
PLOT 185	BEDROOM2	0.19	9.67	Pass
PLOT 185	KLD	1.39	N/A	Pass
PLOT 186	BEDROOM	0.29	12.17	Pass
PLOT 186	KLD	1.89	N/A	Pass
PLOT 187	BEDROOM	0.17	11.17	Pass
PLOT 187	KLD	0.70	N/A	Pass
PLOT 188	BEDROOM1	0.41	15.00	Pass
PLOT 188	BEDROOM2	0.46	11.83	Pass
PLOT 188	KLD	1.65	N/A	Pass



Block E Continued

Criteria for predominantly naturally ventilated home				
Block E	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 189	BEDROOM1	0.15	11.17	Pass
PLOT 189	BEDROOM2	0.19	13.33	Pass
PLOT 189	KLD	0.98	N/A	Pass
PLOT 190	BEDROOM	0.21	11.17	Pass
PLOT 190	KLD	0.59	N/A	Pass
PLOT 191	BEDROOM1	0.18	10.33	Pass
PLOT 191	BEDROOM2	0.31	10.50	Pass
PLOT 191	KLD	1.54	N/A	Pass
PLOT 192	BEDROOM	0.37	12.50	Pass
PLOT 192	KLD	2.25	N/A	Pass
PLOT 193	BEDROOM	0.21	12.17	Pass
PLOT 193	KLD	0.91	N/A	Pass
PLOT 194	BEDROOM1	0.50	16.00	Pass
PLOT 194	BEDROOM2	0.56	12.17	Pass
PLOT 194	KLD	2.10	N/A	Pass
PLOT 195	BEDROOM1	0.25	12.83	Pass
PLOT 195	BEDROOM2	0.33	14.67	Pass
PLOT 195	KLD	1.33	N/A	Pass
PLOT 196	BEDROOM	0.27	12.17	Pass
PLOT 196	KLD	0.77	N/A	Pass



Block F

Criteria for predominantly naturally ventilated home				
Block F	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 146	BEDROOM1	0.46	15.25	Pass
PLOT 146	BEDROOM2	0.43	11	Pass
PLOT 146	KLD	2.66	N/A	Pass
PLOT 147	BEDROOM1	0.32	12.5	Pass
PLOT 147	BEDROOM2	0.41	12.25	Pass
PLOT 147	KLD	1.16	N/A	Pass
PLOT 148	BEDROOM	0.1	9	Pass
PLOT 148	KLD	0.22	N/A	Pass
PLOT 149	BEDROOM	0.1	9.5	Pass
PLOT 149	KLD	0.27	N/A	Pass
PLOT 150	BEDROOM1	0.19	13.5	Pass
PLOT 150	BEDROOM2	0.26	11.5	Pass
PLOT 150	KLD	1.06	N/A	Pass
PLOT 151	BEDROOM1	0.48	18	Pass
PLOT 151	BEDROOM2	0.43	12	Pass
PLOT 151	KLD	2.59	N/A	Pass
PLOT 152	BEDROOM1	0.33	13.75	Pass
PLOT 152	BEDROOM2	0.45	13.25	Pass
PLOT 152	KLD	1.46	N/A	Pass
PLOT 153	BEDROOM1	0.33	14.5	Pass
PLOT 153	BEDROOM2	0.21	10	Pass
PLOT 153	BEDROOM3	0.36	9	Pass
PLOT 153	KLD	0.7	N/A	Pass
PLOT 154	BEDROOM	0.12	10.75	Pass
PLOT 154	KLD	0.3	N/A	Pass
PLOT 155	BEDROOM	0.13	11.5	Pass
PLOT 155	KLD	0.28	N/A	Pass
PLOT 156	BEDROOM1	0.56	18.25	Pass
PLOT 156	BEDROOM2	0.51	16.25	Pass
PLOT 156	KLD	0.79	N/A	Pass
PLOT 157	BEDROOM1	0.44	17.5	Pass
PLOT 157	BEDROOM2	0.42	11.5	Pass
PLOT 157	KLD	2.48	N/A	Pass
PLOT 158	BEDROOM1	0.31	12	Pass
PLOT 158	BEDROOM2	0.44	11.25	Pass
PLOT 158	KLD	1.23	N/A	Pass



Block F Continued

Criteria for predominantly naturally ventilated home				
Block E	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 159	BEDROOM1	0.34	13	Pass
PLOT 159	BEDROOM2	0.21	9	Pass
PLOT 159	BEDROOM3	0.38	8.5	Pass
PLOT 159	KLD	0.68	N/A	Pass
PLOT 160	BEDROOM	0.13	10	Pass
PLOT 160	KLD	0.27	N/A	Pass
PLOT 161	BEDROOM	0.13	12	Pass
PLOT 161	KLD	0.3	N/A	Pass
PLOT 162	BEDROOM1	0.56	18	Pass
PLOT 162	BEDROOM2	0.5	16	Pass
PLOT 162	KLD	0.79	N/A	Pass
PLOT 163	BEDROOM1	0.43	14.5	Pass
PLOT 163	BEDROOM2	0.43	10.25	Pass
PLOT 163	KLD	2.4	N/A	Pass
PLOT 164	BEDROOM	0.11	9.5	Pass
PLOT 164	KLD	0.3	N/A	Pass
PLOT 165	BEDROOM1	0.64	16.5	Pass
PLOT 165	BEDROOM2	0.59	15.75	Pass
PLOT 165	KLD	0.8	N/A	Pass



Block G

Criteria for predominantly naturally ventilated home				
Block G	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 108	BEDROOM1	0.32	16	Pass
PLOT 108	BEDROOM2	0.43	16.5	Pass
PLOT 108	KLD	1.37	N/A	Pass
PLOT 109	BEDROOM	0.12	10.5	Pass
PLOT 109	KLD	0.37	N/A	Pass
PLOT 110	BEDROOM	0.09	9.5	Pass
PLOT 110	KLD	0.32	N/A	Pass
PLOT 111	BEDROOM1	0.39	20	Pass
PLOT 111	BEDROOM2	0.4	15.5	Pass
PLOT 111	KLD	0.9	N/A	Pass
PLOT 112	BEDROOM1	0.43	20.25	Pass
PLOT 112	BEDROOM2	0.44	13	Pass
PLOT 112	KLD	2.28	N/A	Pass
PLOT 113	BEDROOM1	0.37	18	Pass
PLOT 113	BEDROOM2	0.5	17.75	Pass
PLOT 113	KLD	1.45	N/A	Pass
PLOT 114	BEDROOM1	0.55	19.25	Pass
PLOT 114	BEDROOM2	0.15	11	Pass
PLOT 114	BEDROOM3	0.45	11.75	Pass
PLOT 114	KLD	0.83	N/A	Pass
PLOT 115	BEDROOM	0.14	11.5	Pass
PLOT 115	KLD	0.39	N/A	Pass
PLOT 116	BEDROOM	0.1	10.5	Pass
PLOT 116	KLD	0.34	N/A	Pass
PLOT 117	BEDROOM1	0.69	26.75	Pass
PLOT 117	BEDROOM2	0.55	24.75	Pass
PLOT 117	KLD	0.84	N/A	Pass
PLOT 118	BEDROOM1	0.45	22.75	Pass
PLOT 118	BEDROOM2	0.45	15.5	Pass
PLOT 118	KLD	2.34	N/A	Pass
PLOT 119	BEDROOM1	0.34	15.75	Pass
PLOT 119	BEDROOM2	0.47	15.5	Pass
PLOT 119	KLD	1.39	N/A	Pass
PLOT 120	BEDROOM1	0.61	18.25	Pass
PLOT 120	BEDROOM2	0.2	10.75	Pass
PLOT 120	BEDROOM3	0.55	11.75	Pass
PLOT 120	KLD	0.83	N/A	Pass



Block G Continued

Criteria for predominantly naturally ventilated home				
Block G	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 121	BEDROOM	0.15	9.25	Pass
PLOT 121	KLD	0.44	N/A	Pass
PLOT 122	BEDROOM	0.1	9.75	Pass
PLOT 122	KLD	0.34	N/A	Pass
PLOT 123	BEDROOM1	0.68	27	Pass
PLOT 123	BEDROOM2	0.55	24.5	Pass
PLOT 123	KLD	0.81	N/A	Pass
PLOT 124	BEDROOM1	0.44	22.5	Pass
PLOT 124	BEDROOM2	0.44	15.25	Pass
PLOT 124	KLD	2.27	N/A	Pass
PLOT 125	BEDROOM	0.09	8.75	Pass
PLOT 125	KLD	0.32	N/A	Pass
PLOT 126	BEDROOM1	0.69	23.25	Pass
PLOT 126	BEDROOM2	0.62	22.5	Pass
PLOT 126	KLD	0.75	N/A	Pass
PLOT 127	BEDROOM1	0.41	20	Pass
PLOT 127	BEDROOM2	0.43	13.5	Pass
PLOT 127	KLD	2.12	N/A	Pass

FOG

Criteria for predominantly naturally ventilated home				
FOG	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 24	BEDROOM1	1.65	10	Pass
PLOT 24	BEDROOM2	1.23	21.5	Pass
PLOT 24	KLD	0.92	N/A	Pass
PLOT 36	BEDROOM1	0.58	11.25	Pass
PLOT 36	BEDROOM2	0.61	27.75	Pass
PLOT 36	KLD	0.72	N/A	Pass
PLOT 39	BEDROOM1	0.56	11.25	Pass
PLOT 39	BEDROOM2	0.59	27	Pass
PLOT 39	KLD	0.71	N/A	Pass
PLOT 106	BEDROOM1	0.95	12.75	Pass
PLOT 106	BEDROOM2	0.78	31.75	Pass
PLOT 106	KLD	0.89	N/A	Pass
PLOT 107	BEDROOM1	1.01	13.00	Pass
PLOT 107	BEDROOM2	0.78	31.50	Pass
PLOT 107	KLD	0.89	N/A	Pass
PLOT 128	BEDROOM1	1.76	11	Pass
PLOT 128	BEDROOM2	1.29	25	Pass
PLOT 128	KLD	1.15	N/A	Pass
PLOT 133	BEDROOM1	1.75	11	Pass
PLOT 133	BEDROOM2	1.28	24.75	Pass
PLOT 133	KLD	1.11	N/A	Pass
PLOT 140	BEDROOM1	0.68	8.25	Pass
PLOT 140	BEDROOM2	0.71	19	Pass
PLOT 140	KLD	0.86	N/A	Pass
PLOT 145	BEDROOM1	0.67	8.25	Pass
PLOT 145	BEDROOM2	0.71	19	Pass
PLOT 145	KLD	0.86	N/A	Pass
PLOT 174	BEDROOM1	0.69	8.75	Pass
PLOT 174	BEDROOM2	0.67	19.75	Pass
PLOT 174	KLD	0.8	N/A	Pass
PLOT 197	BEDROOM1	0.85	8.5	Pass
PLOT 197	BEDROOM2	0.69	19.5	Pass
PLOT 197	KLD	0.8	N/A	Pass
PLOT 228	BEDROOM1	0.5	7.25	Pass
PLOT 228	BEDROOM2	0.49	17	Pass
PLOT 228	KLD	0.7	N/A	Pass
PLOT 240	BEDROOM1	2.24	12.25	Pass
PLOT 240	BEDROOM2	1.4	28	Pass
PLOT 240	KLD	1.02	N/A	Pass



HT1

Criteria for predominantly naturally ventilated home				
HT1	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 28	BEDROOM1	0.27	24.50	Pass
PLOT 28	BEDROOM2	0.36	14.00	Pass
PLOT 28	KLD	0.62	N/A	Pass
PLOT 29	BEDROOM1	0.27	24.75	Pass
PLOT 29	BEDROOM2	0.36	13.50	Pass
PLOT 29	KLD	0.62	N/A	Pass
PLOT 30	BEDROOM1	0.27	24.50	Pass
PLOT 30	BEDROOM2	0.36	13.50	Pass
PLOT 30	KLD	0.62	N/A	Pass
PLOT 31	BEDROOM1	0.25	24.00	Pass
PLOT 31	BEDROOM2	0.36	13.50	Pass
PLOT 31	KLD	0.59	N/A	Pass
PLOT 75	BEDROOM1	0.26	23.75	Pass
PLOT 75	BEDROOM2	0.38	14.25	Pass
PLOT 75	KLD	0.61	N/A	Pass
PLOT 76	BEDROOM1	0.27	24.00	Pass
PLOT 76	BEDROOM2	0.38	14.00	Pass
PLOT 76	KLD	0.58	N/A	Pass
PLOT 77	BEDROOM1	0.26	23.25	Pass
PLOT 77	BEDROOM2	0.38	13.50	Pass
PLOT 77	KLD	0.55	N/A	Pass
PLOT 78	BEDROOM1	0.22	22.50	Pass
PLOT 78	BEDROOM2	0.37	13.50	Pass
PLOT 78	KLD	0.52	N/A	Pass
PLOT 203	BEDROOM1	0.27	24.50	Pass
PLOT 203	BEDROOM2	0.37	14.00	Pass
PLOT 203	KLD	0.62	N/A	Pass
PLOT 204	BEDROOM1	0.28	25.00	Pass
PLOT 204	BEDROOM2	0.37	13.50	Pass
PLOT 204	KLD	0.62	N/A	Pass
PLOT 205	BEDROOM1	0.29	25.00	Pass
PLOT 205	BEDROOM2	0.37	13.50	Pass
PLOT 205	KLD	0.62	N/A	Pass
PLOT 206	BEDROOM1	0.25	24.25	Pass
PLOT 206	BEDROOM2	0.36	13.75	Pass
PLOT 206	KLD	0.61	N/A	Pass
PLOT 233	BEDROOM1	0.25	23.50	Pass
PLOT 233	BEDROOM2	0.38	14.25	Pass
PLOT 233	KLD	0.61	N/A	Pass



HT1 Continued

Criteria for predominantly naturally ventilated home				
HT1	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 234	BEDROOM1	0.27	24.50	Pass
PLOT 234	BEDROOM2	0.38	14.00	Pass
PLOT 234	KLD	0.61	N/A	Pass
PLOT 235	BEDROOM1	0.27	24.00	Pass
PLOT 235	BEDROOM2	0.39	13.75	Pass
PLOT 235	KLD	0.59	N/A	Pass
PLOT 236	BEDROOM1	0.23	22.50	Pass
PLOT 236	BEDROOM2	0.38	14.00	Pass
PLOT 236	KLD	0.55	N/A	Pass

HT2

Criteria for predominantly naturally ventilated home				
HT2	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 32	BEDROOM1	0.24	15.5	Pass
PLOT 32	BEDROOM2	0.45	18.75	Pass
PLOT 32	BEDROOM3	0.12	19.75	Pass
PLOT 32	KLD	0.84	N/A	Pass
PLOT 33	BEDROOM1	0.25	15.25	Pass
PLOT 33	BEDROOM2	0.48	22	Pass
PLOT 33	BEDROOM3	0.13	20	Pass
PLOT 33	KLD	0.84	N/A	Pass
PLOT 42	BEDROOM1	0.30	20.75	Pass
PLOT 42	BEDROOM2	0.52	30.50	Pass
PLOT 42	BEDROOM3	0.14	32	Pass
PLOT 42	KLD	0.97	N/A	Pass
PLOT 43	BEDROOM1	0.31	21.25	Pass
PLOT 43	BEDROOM2	0.52	30.75	Pass
PLOT 43	BEDROOM3	0.10	32	Pass
PLOT 43	KLD	1.02	N/A	Pass
PLOT 44	BEDROOM1	0.29	18	Pass
PLOT 44	BEDROOM2	0.45	22	Pass
PLOT 44	BEDROOM3	0.1	23	Pass
PLOT 44	KLD	0.98	N/A	Pass
PLOT 45	BEDROOM1	0.29	18	Pass
PLOT 45	BEDROOM2	0.45	23	Pass
PLOT 45	BEDROOM3	0.12	25	Pass
PLOT 45	KLD	0.94	N/A	Pass
PLOT 48	BEDROOM1	0.21	15.25	Pass
PLOT 48	BEDROOM2	0.41	21.25	Pass
PLOT 48	BEDROOM3	0.12	24.5	Pass
PLOT 48	KLD	0.75	N/A	Pass
PLOT 49	BEDROOM1	0.22	15.5	Pass
PLOT 49	BEDROOM2	0.41	21	Pass
PLOT 49	BEDROOM3	0.1	21	Pass
PLOT 49	KLD	0.79	N/A	Pass
PLOT 50	BEDROOM1	0.22	15.75	Pass
PLOT 50	BEDROOM2	0.41	21	Pass
PLOT 50	BEDROOM3	0.1	21.25	Pass
PLOT 50	KLD	0.79	N/A	Pass



HT2 Continued

Criteria for predominantly naturally ventilated home				
HT2	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 51	BEDROOM1	0.21	15.75	Pass
PLOT 51	BEDROOM2	0.38	21.25	Pass
PLOT 51	BEDROOM3	0.11	24	Pass
PLOT 51	KLD	0.77	N/A	Pass
PLOT 79	BEDROOM1	0.4	17	Pass
PLOT 79	BEDROOM2	0.4	22.25	Pass
PLOT 79	BEDROOM3	0.12	20.25	Pass
PLOT 79	KLD	0.9	N/A	Pass
PLOT 80	BEDROOM1	0.36	16	Pass
PLOT 80	BEDROOM2	0.35	19.75	Pass
PLOT 80	BEDROOM3	0.1	18.5	Pass
PLOT 80	KLD	0.84	N/A	Pass
PLOT 134	BEDROOM1	0.31	14.75	Pass
PLOT 134	BEDROOM2	0.35	22	Pass
PLOT 134	BEDROOM3	0.11	19	Pass
PLOT 134	KLD	0.77	N/A	Pass
PLOT 135	BEDROOM1	0.29	13.5	Pass
PLOT 135	BEDROOM2	0.38	22.25	Pass
PLOT 135	BEDROOM3	0.1	16	Pass
PLOT 135	KLD	0.76	N/A	Pass
PLOT 136	BEDROOM1	0.28	13.75	Pass
PLOT 136	BEDROOM2	0.38	21.25	Pass
PLOT 136	BEDROOM3	0.1	16.75	Pass
PLOT 136	KLD	0.77	N/A	Pass
PLOT 137	BEDROOM1	0.31	17.75	Pass
PLOT 137	BEDROOM2	0.36	15.25	Pass
PLOT 137	BEDROOM3	0.11	18	Pass
PLOT 137	KLD	1.03	N/A	Pass
PLOT 138	BEDROOM1	0.33	18	Pass
PLOT 138	BEDROOM2	0.34	17	Pass
PLOT 138	BEDROOM3	0.1	16.5	Pass
PLOT 138	KLD	1.12	N/A	Pass
PLOT 139	BEDROOM1	0.31	18	Pass
PLOT 139	BEDROOM2	0.35	17	Pass
PLOT 139	BEDROOM3	0.1	18	Pass
PLOT 139	KLD	1.02	N/A	Pass



HT2 Continued

Criteria for predominantly naturally ventilated home				
HT2	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 169	BEDROOM1	0.19	12.25	Pass
PLOT 169	BEDROOM2	0.36	25.75	Pass
PLOT 169	BEDROOM3	0.12	23	Pass
PLOT 169	KLD	0.67	N/A	Pass
PLOT 170	BEDROOM1	0.19	11.75	Pass
PLOT 170	BEDROOM2	0.31	24.75	Pass
PLOT 170	BEDROOM3	0.11	22	Pass
PLOT 170	KLD	0.57	N/A	Pass
PLOT 201	BEDROOM1	0.19	12	Pass
PLOT 201	BEDROOM2	0.31	26.25	Pass
PLOT 201	BEDROOM3	0.11	22.75	Pass
PLOT 201	KLD	0.57	N/A	Pass
PLOT 202	BEDROOM1	0.18	11.5	Pass
PLOT 202	BEDROOM2	0.34	24.75	Pass
PLOT 202	BEDROOM3	0.11	21.25	Pass
PLOT 202	KLD	0.57	N/A	Pass
PLOT 237	BEDROOM1	0.18	12.25	Pass
PLOT 237	BEDROOM2	0.37	24.75	Pass
PLOT 237	BEDROOM3	0.11	22.5	Pass
PLOT 237	KLD	0.57	N/A	Pass
PLOT 238	BEDROOM1	0.18	11	Pass
PLOT 238	BEDROOM2	0.33	24.25	Pass
PLOT 238	BEDROOM3	0.09	18.75	Pass
PLOT 238	KLD	0.57	N/A	Pass
PLOT 239	BEDROOM1	0.18	11.25	Pass
PLOT 239	BEDROOM2	0.29	23.5	Pass
PLOT 239	BEDROOM3	0.1	20.25	Pass
PLOT 239	KLD	0.54	N/A	Pass



HT3

Criteria for predominantly naturally ventilated home				
HT3	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 46	BEDROOM1	0.41	14	Pass
PLOT 46	BEDROOM2	0.32	21.75	Pass
PLOT 46	BEDROOM3	0.23	18	Pass
PLOT 46	KD	0.54	N/A	Pass
PLOT 46	LIVINGROOM	0.81	N/A	Pass
PLOT 47	BEDROOM1	0.44	20.25	Pass
PLOT 47	BEDROOM2	0.35	22.25	Pass
PLOT 47	BEDROOM3	0.24	18.75	Pass
PLOT 47	KD	0.48	N/A	Pass
PLOT 47	LIVINGROOM	0.84	N/A	Pass
PLOT 103	BEDROOM1	0.45	18.25	Pass
PLOT 103	BEDROOM2	0.31	21.75	Pass
PLOT 103	BEDROOM3	0.25	20.25	Pass
PLOT 103	KD	0.92	N/A	Pass
PLOT 103	LIVINGROOM	0.84	N/A	Pass
PLOT 104	BEDROOM1	0.52	31.5	Pass
PLOT 104	BEDROOM2	0.35	24.5	Pass
PLOT 104	BEDROOM3	0.31	21.5	Pass
PLOT 104	KD	0.99	N/A	Pass
PLOT 104	LIVINGROOM	0.92	N/A	Pass
PLOT 105	BEDROOM1	0.52	32	Pass
PLOT 105	BEDROOM2	0.34	23.75	Pass
PLOT 105	BEDROOM3	0.3	21.75	Pass
PLOT 105	KD	0.88	N/A	Pass
PLOT 105	LIVINGROOM	0.93	N/A	Pass
PLOT 129	BEDROOM1	0.42	21.75	Pass
PLOT 129	BEDROOM2	0.45	28.5	Pass
PLOT 129	BEDROOM3	0.35	31.5	Pass
PLOT 129	KD	0.46	N/A	Pass
PLOT 129	LIVINGROOM	0.94	N/A	Pass
PLOT 130	BEDROOM1	0.44	22.25	Pass
PLOT 130	BEDROOM2	0.48	29.75	Pass
PLOT 130	BEDROOM3	0.36	31.75	Pass
PLOT 130	KD	0.44	N/A	Pass
PLOT 130	LIVINGROOM	1.01	N/A	Pass



HT3 Continued

Criteria for predominantly naturally ventilated home				
HT3	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 131	BEDROOM1	0.37	20.5	Pass
PLOT 131	BEDROOM2	0.38	18.75	Pass
PLOT 131	BEDROOM3	0.32	20	Pass
PLOT 131	KD	0.43	N/A	Pass
PLOT 131	LIVINGROOM	0.74	N/A	Pass
PLOT 132	BEDROOM1	0.36	19.5	Pass
PLOT 132	BEDROOM2	0.36	18.25	Pass
PLOT 132	BEDROOM3	0.26	18.75	Pass
PLOT 132	KD	0.41	N/A	Pass
PLOT 132	LIVINGROOM	0.77	N/A	Pass
PLOT 141	BEDROOM1	0.32	14	Pass
PLOT 141	BEDROOM2	0.32	21.5	Pass
PLOT 141	BEDROOM3	0.27	19.5	Pass
PLOT 141	KD	0.76	N/A	Pass
PLOT 141	LIVINGROOM	0.7	N/A	Pass
PLOT 142	BEDROOM1	0.34	14.75	Pass
PLOT 142	BEDROOM2	0.34	22.75	Pass
PLOT 142	BEDROOM3	0.29	20.25	Pass
PLOT 142	KD	0.85	N/A	Pass
PLOT 142	LIVINGROOM	0.7	N/A	Pass
PLOT 143	BEDROOM1	0.34	14.75	Pass
PLOT 143	BEDROOM2	0.34	22.75	Pass
PLOT 143	BEDROOM3	0.29	20.25	Pass
PLOT 143	KD	0.85	N/A	Pass
PLOT 143	LIVINGROOM	0.7	N/A	Pass
PLOT 144	BEDROOM1	0.34	15.25	Pass
PLOT 144	BEDROOM2	0.32	22.25	Pass
PLOT 144	BEDROOM3	0.3	20.25	Pass
PLOT 144	KD	0.77	N/A	Pass
PLOT 144	LIVINGROOM	0.74	N/A	Pass
PLOT 166	BEDROOM1	0.43	19.75	Pass
PLOT 166	BEDROOM2	0.24	16.5	Pass
PLOT 166	BEDROOM3	0.2	16.75	Pass
PLOT 166	KD	0.37	N/A	Pass
PLOT 166	LIVINGROOM	0.98	N/A	Pass



HT3 Continued

Criteria for predominantly naturally ventilated home				
HT3	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 167	BEDROOM1	0.37	25.25	Pass
PLOT 167	BEDROOM2	0.28	16.25	Pass
PLOT 167	BEDROOM3	0.2	15.5	Pass
PLOT 167	KD	0.35	N/A	Pass
PLOT 167	LIVINGROOM	0.79	N/A	Pass
PLOT 168	BEDROOM1	0.36	23.75	Pass
PLOT 168	BEDROOM2	0.25	15.5	Pass
PLOT 168	BEDROOM3	0.19	15.25	Pass
PLOT 168	KD	0.32	N/A	Pass
PLOT 168	LIVINGROOM	0.72	N/A	Pass
PLOT 171	BEDROOM1	0.38	25.25	Pass
PLOT 171	BEDROOM2	0.27	16.5	Pass
PLOT 171	BEDROOM3	0.2	16.75	Pass
PLOT 171	KD	0.36	N/A	Pass
PLOT 171	LIVINGROOM	0.84	N/A	Pass
PLOT 172	BEDROOM1	0.38	25.75	Pass
PLOT 172	BEDROOM2	0.29	16.25	Pass
PLOT 172	BEDROOM3	0.2	16.5	Pass
PLOT 172	KD	0.35	N/A	Pass
PLOT 172	LIVINGROOM	0.86	N/A	Pass
PLOT 173	BEDROOM1	0.36	18.5	Pass
PLOT 173	BEDROOM2	0.27	14.75	Pass
PLOT 173	BEDROOM3	0.2	16	Pass
PLOT 173	KD	0.36	N/A	Pass
PLOT 173	LIVINGROOM	0.84	N/A	Pass
PLOT 198	BEDROOM1	0.41	15.5	Pass
PLOT 198	BEDROOM2	0.2	16	Pass
PLOT 198	BEDROOM3	0.2	16.5	Pass
PLOT 198	KD	0.37	N/A	Pass
PLOT 198	LIVINGROOM	0.96	N/A	Pass
PLOT 199	BEDROOM1	0.37	25.25	Pass
PLOT 199	BEDROOM2	0.28	16.25	Pass
PLOT 199	BEDROOM3	0.2	16	Pass
PLOT 199	KD	0.35	N/A	Pass
PLOT 199	LIVINGROOM	0.79	N/A	Pass



HT3 Continued

Criteria for predominantly naturally ventilated home				
HT3	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 200	BEDROOM1	0.36	19	Pass
PLOT 200	BEDROOM2	0.25	14.75	Pass
PLOT 200	BEDROOM3	0.2	15.75	Pass
PLOT 200	KD	0.36	N/A	Pass
PLOT 200	LIVINGROOM	0.84	N/A	Pass
PLOT 241	BEDROOM1	0.39	24.5	Pass
PLOT 241	BEDROOM2	0.2	14.5	Pass
PLOT 241	BEDROOM3	0.19	15.25	Pass
PLOT 241	KD	0.32	N/A	Pass
PLOT 241	LIVINGROOM	0.77	N/A	Pass
PLOT 242	BEDROOM1	0.38	17.5	Pass
PLOT 242	BEDROOM2	0.2	13.75	Pass
PLOT 242	BEDROOM3	0.19	15	Pass
PLOT 242	KD	0.34	N/A	Pass
PLOT 242	LIVINGROOM	0.79	N/A	Pass

HT4

Criteria for predominantly naturally ventilated home				
HT4	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 3	BEDROOM1	0.17	20.25	Pass
PLOT 3	BEDROOM2	0.5	16.75	Pass
PLOT 3	BEDROOM3	0.39	22	Pass
PLOT 3	BEDROOM4	0.43	17.5	Pass
PLOT 3	KLD	0.81	N/A	Pass
PLOT 4	BEDROOM1	0.18	20.75	Pass
PLOT 4	BEDROOM2	0.52	17	Pass
PLOT 4	BEDROOM3	0.4	22.25	Pass
PLOT 4	BEDROOM4	0.45	18.5	Pass
PLOT 4	KLD	0.84	N/A	Pass
PLOT 25	BEDROOM1	0.13	16.5	Pass
PLOT 25	BEDROOM2	0.23	10.75	Pass
PLOT 25	BEDROOM3	0.35	18.75	Pass
PLOT 25	BEDROOM4	0.18	12.5	Pass
PLOT 25	KLD	0.35	N/A	Pass
PLOT 27	BEDROOM1	0.13	17.5	Pass
PLOT 27	BEDROOM2	0.23	11	Pass
PLOT 27	BEDROOM3	0.35	20	Pass
PLOT 27	BEDROOM4	0.18	13	Pass
PLOT 27	KLD	0.35	N/A	Pass
PLOT 72	BEDROOM1	0.14	17.5	Pass
PLOT 72	BEDROOM2	0.23	11	Pass
PLOT 72	BEDROOM3	0.36	20.25	Pass
PLOT 72	BEDROOM4	0.19	13	Pass
PLOT 72	KLD	0.35	N/A	Pass
PLOT 74	BEDROOM1	0.13	16.5	Pass
PLOT 74	BEDROOM2	0.23	10.75	Pass
PLOT 74	BEDROOM3	0.34	18.75	Pass
PLOT 74	BEDROOM4	0.18	12.5	Pass
PLOT 74	KLD	0.34	N/A	Pass
PLOT 207	BEDROOM1	0.17	12.5	Pass
PLOT 207	BEDROOM2	0.39	17.25	Pass
PLOT 207	BEDROOM3	0.22	13	Pass
PLOT 207	BEDROOM4	0.29	17.75	Pass
PLOT 207	KLD	0.74	N/A	Pass



HT4 Continued

Criteria for predominantly naturally ventilated home				
HT4	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 209	BEDROOM1	0.17	14	Pass
PLOT 209	BEDROOM2	0.4	18.25	Pass
PLOT 209	BEDROOM3	0.23	14.75	Pass
PLOT 209	BEDROOM4	0.3	19.5	Pass
PLOT 209	KLD	0.76	N/A	Pass
PLOT 230	BEDROOM1	0.17	13	Pass
PLOT 230	BEDROOM2	0.39	18	Pass
PLOT 230	BEDROOM3	0.22	13.5	Pass
PLOT 230	BEDROOM4	0.29	18	Pass
PLOT 230	KLD	0.74	N/A	Pass
PLOT 232	BEDROOM1	0.17	14	Pass
PLOT 232	BEDROOM2	0.4	18	Pass
PLOT 232	BEDROOM3	0.23	14.5	Pass
PLOT 232	BEDROOM4	0.29	19.25	Pass
PLOT 232	KLD	0.75	N/A	Pass
PLOT 243	BEDROOM1	0.18	20.75	Pass
PLOT 243	BEDROOM2	0.52	17	Pass
PLOT 243	BEDROOM3	0.4	22.25	Pass
PLOT 243	BEDROOM4	0.45	18.5	Pass
PLOT 243	KLD	0.84	N/A	Pass
PLOT 244	BEDROOM1	0.17	20.25	Pass
PLOT 244	BEDROOM2	0.5	16.75	Pass
PLOT 244	BEDROOM3	0.39	22	Pass
PLOT 244	BEDROOM4	0.43	17.5	Pass
PLOT 244	KLD	0.81	N/A	Pass



HT5

Criteria for predominantly naturally ventilated home				
HT5	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 1	BEDROOM1	0.33	14.25	Pass
PLOT 1	BEDROOM2	0.31	7.75	Pass
PLOT 1	BEDROOM3	0.27	29.5	Pass
PLOT 1	BEDROOM4	0.36	20.25	Pass
PLOT 1	KLD	0.79	N/A	Pass
PLOT 35	BEDROOM1	0.29	15.25	Pass
PLOT 35	BEDROOM2	0.44	9	Pass
PLOT 35	BEDROOM3	0.44	25.25	Pass
PLOT 35	BEDROOM4	0.33	27	Pass
PLOT 35	KLD	0.77	N/A	Pass

HT6

Criteria for predominantly naturally ventilated home				
HT6	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 2	BEDROOM1	0.17	25	Pass
PLOT 2	BEDROOM2	0.32	24.25	Pass
PLOT 2	BEDROOM3	0.31	27.75	Pass
PLOT 2	BEDROOM4	0.26	18	Pass
PLOT 2	KLD	0.8	N/A	Pass
PLOT 34	BEDROOM1	0.25	24.5	Pass
PLOT 34	BEDROOM2	0.37	31	Pass
PLOT 34	BEDROOM3	0.52	24.5	Pass
PLOT 34	BEDROOM4	0.24	23	Pass
PLOT 34	KLD	0.86	N/A	Pass



HT7

Criteria for predominantly naturally ventilated home				
HT7	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 26	BEDROOM1	0.13	16.75	Pass
PLOT 26	BEDROOM2	0.18	11.25	Pass
PLOT 26	BEDROOM3	0.24	18.5	Pass
PLOT 26	BEDROOM4	0.2	10.25	Pass
PLOT 26	KLD	0.35	N/A	Pass
PLOT 73	BEDROOM1	0.13	16.75	Pass
PLOT 73	BEDROOM2	0.18	11.25	Pass
PLOT 73	BEDROOM3	0.24	18.5	Pass
PLOT 73	BEDROOM4	0.2	10.25	Pass
PLOT 73	KLD	0.35	N/A	Pass
PLOT 208	BEDROOM1	0.17	13.75	Pass
PLOT 208	BEDROOM2	0.28	16.25	Pass
PLOT 208	BEDROOM3	0.18	14.25	Pass
PLOT 208	BEDROOM4	0.35	16.25	Pass
PLOT 208	KLD	0.8	N/A	Pass
PLOT 231	BEDROOM1	0.17	13.5	Pass
PLOT 231	BEDROOM2	0.28	16.25	Pass
PLOT 231	BEDROOM3	0.18	14	Pass
PLOT 231	BEDROOM4	0.35	16.25	Pass
PLOT 231	KLD	0.79	N/A	Pass



HT8

Criteria for predominantly naturally ventilated home				
HT8	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
PLOT 37	BEDROOM1	0.14	10.75	Pass
PLOT 37	BEDROOM2	0.15	28.25	Pass
PLOT 37	BEDROOM3	0.3	22.25	Pass
PLOT 37	BEDROOM4	0.38	8.25	Pass
PLOT 37	KLD	0.76	N/A	Pass
PLOT 38	BEDROOM1	0.12	25.75	Pass
PLOT 38	BEDROOM2	0.15	28.75	Pass
PLOT 38	BEDROOM3	0.3	22.25	Pass
PLOT 38	BEDROOM4	0.3	16	Pass
PLOT 38	KLD	0.75	N/A	Pass
PLOT 40	BEDROOM1	0.12	24.5	Pass
PLOT 40	BEDROOM2	0.14	27.75	Pass
PLOT 40	BEDROOM3	0.3	21	Pass
PLOT 40	BEDROOM4	0.29	15.75	Pass
PLOT 40	KLD	0.74	N/A	Pass
PLOT 41	BEDROOM1	0.19	11	Pass
PLOT 41	BEDROOM2	0.15	29	Pass
PLOT 41	BEDROOM3	0.29	22.5	Pass
PLOT 41	BEDROOM4	0.36	4.75	Pass
PLOT 41	KLD	0.77	N/A	Pass



10. Conclusion

- The results have represented the house types/units and orientation which provides a thorough analysis of overheating, and the measures implemented to alleviate this issue.
- This assessment has been undertaken in accordance with CIBSE TM59 methodology which aligns with room profiles, equipment, lighting, and occupancy gains.
- The modelling has been conducted using weather data London Gatwick – Design Summer Year 1 (DSY1 – 2020, high emission, 50% percentile scenario).
- The results of the initial modelling indicated that during peak summertime conditions the dwelling failed to maintain acceptable levels of thermal comfort, with zones failing to meet more than one of the CIBSE TM59 criteria.
- To address this, the following improvement measures have been implemented to demonstrate compliance for the dwelling and maintain acceptable levels of thermal comfort.
 - The incorporation of passive design measures to manage solar gain such as cross-ventilation where applicable, the thermal mass of internal building elements and glazing g-value set to 0.40.
 - Natural ventilation has been provided to all areas through side hung openable windows– excluding ground floor apartments which have restricted openings due to security risks.
 - Houses to benefit from decentralised mechanical extract ventilation (dMEV) to wet rooms – installed in line with Part F.
 - Apartments to benefit from Mechanical Ventilation with Heat Recovery (MVHR) System –installed in line with Part F.
- The results of the ADO (Overheating) Noise Assessment by RBA Acoustics indicate there are windows on certain façade with limited openings to mitigate noise levels in line with Part O guidance. Also, windows on the ground floor units will require to be fixed overnight due to security issues.
- Subsequently, the dwelling has demonstrated compliance with both Criterion as defined by CIBSE TM59 methodology and maintain acceptable levels of thermal comfort.
 - a. *For living rooms, kitchens and bedrooms: the number of hours during which DT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM52 Criterion 1: Hours of exceedance).*
 - 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 annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for*

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