

Station Road, Warnham

Energy & Sustainability Strategy

Version 02

NU PLANET

Project Details

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Station Road, Warnham

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Contents

4	Executive summary	23	Water consumption
7	Introduction	24	Part G water efficiency calculator
8	Development overview	25	White goods / Lighting
9	Objectives	26	Sustainable transport
10	Planning policy and regulations	27	Pollution
11	Energy Strategy	28	Light pollution
12	Be Lean	29	Sustainable materials
14	Be Clean	30	Waste management
15	Be Green	31	Build quality
16	LZC feasibility study	32	Health & wellbeing
18	Be Green	33	Ecology
19	Be Seen	34	Reducing Construction Impact
20	Overheating	35	Conclusion
21	Sustainability Strategy		
22	Flood risk and drainage		

Executive Summary

This Energy & Sustainability Strategy supports the planning application at Station Road, Warnham, for redevelopment of the site to provide 24 new homes within the Horsham District.

It outlines the proposed Energy Strategy and demonstrates compliance with relevant energy and sustainability policies for Horsham District Planning Framework.

Development Overview

- Description:** Outline application for the erection of approximately 24 residential dwellings, with all matters reserved except for access.
- Location:** Station Road, Warnham, West Sussex, RH12 3SR
- Units:** 24 residential units comprising
- Type A – 4no. One-bedroom units
 - Type B – 10no. Two-bedroom units
 - Type C – 8no. Three-bedroom units
 - Type D – 2no. Four-bedroom units



Executive Summary

Policy & targets

Key energy and sustainability policies and targets from the Horsham Local Plan and The National Planning Policy Framework are summarised below with a snapshot of the development's alignment with these goals:

National Policy - NPPF

- Chapter 02. Achieving Sustainable Development
- Chapter 14. Meeting the challenge of climate change, flooding and coastal change.

Horsham District Planning Framework - Nov 2015

Chapter 10: Climate Change

Policy 35: Climate Change

- This report outlines the proposed measures to help mitigate the effects of climate change.
- The proposed energy strategy which will reduce energy consumption through a combination of passive design and the adoption of renewable and low carbon technologies
- Measures to reduce water consumption have been considered

Policy 36: Appropriate Energy Use

- This energy strategy follows the energy hierarchy (Be Lean, Be Clean, Be Green & Be Seen) to help develop a suitable strategy to reduce energy consumption
- The outlined strategy will provide a Zero Carbon ready scheme through zero & low carbon heating systems, with a proportion of energy demand met through onsite generation

Policy 37: Sustainable Construction

- This strategy highlights proposed measures to maximise energy efficiency, which includes the adoption of renewable and low carbon technologies
- Water conservation has been considered, with a set of water flow rate targets and a supporting water calculation, confirms that a maximum 110l/p/d will be achieved
- A strategy to proposed natural light and ventilation has been included within the sustainable design sections within this report
- A sustainable transport strategy will be adopted
- Additional sustainable design considerations will be adopted to manage waste, improve health & wellbeing, encourage the use of low-impact materials and enhance the ecological value of the site

Policy 38: Flooding

- The site is confirmed to be in Flood Zone 1

Chapter 11: Infrastructure, Transport and Healthy Communities

Policy 40: Sustainable Transport

- A sustainable transport strategy has been considered within this report, with the inclusion of EV charging and bicycle storage

The proposed strategy is in line with current and emerging Local Plan policies.

Executive Summary

Be Lean [Use Less Energy]

- The development will incorporate high-performance fabric, energy-efficient lighting, delivering savings in CO₂ emissions through passive design measures.

Be Clean [Supply Energy Efficiently]

- It is not possible to connect to an existing heat network at this currently time, so no further reductions can be achieved at this stage of the energy hierarchy

Be Green [Use Renewable Energy]

- Heating and hot water will be delivered by ASHP powered systems.
- Between 1.5-4.0kWp PV array will be fitted to the most Southerly facing roof on each proposed dwelling.

Introduction

This Energy & Sustainability Strategy has been prepared on behalf of Wienerberger Ltd by NuPlanet, a specialist Building Performance Consultancy. This strategy sets out the design and construction measures to be followed to ensure the delivery of a high quality, low energy, sustainable development on the land to the north of Station Road, Warnham.



Development overview

Development Overview

Description: Outline application for the erection of approximately 24 residential dwellings, with all matters reserved except for access.

Location: Station Road, Warnham, West Sussex, RH12 3SR

Units: 24 residential units comprising

- Type A – 4no. One-bedroom units
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- Type C – 8no. Three-bedroom units
- Type D – 2no. Four-bedroom units

Please refer to the accommodation schedule in Table 01

TABLE 01 ACCOMMODATION SCHEDULE	OPEN MARKET	AFFORDABLE	INTERMEDIATE	TOTAL
ONE-BED TWO-PERSON HOUSE	2	1	1	4
TWO-BED FOUR-PERSON HOUSE	6	2	2	10
THREE-BED FIVE-PERSON HOUSE	6	2	0	8
FOUR-BED SIX-PERSON HOUSE	2	0	0	2
TOTAL	24	5	3	24

Objectives

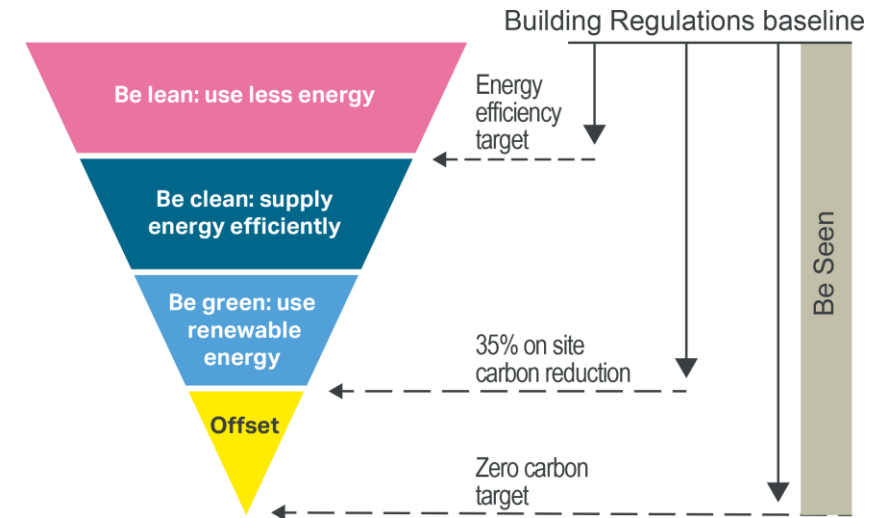
The objectives of this report are to demonstrate how the development responds to national and local planning sustainability policies, and to outline how CO₂ emissions will be minimised in accordance with national Building Regulations requirements. This strategy has considered several important objectives, including:

- A viable reduction in CO₂ emissions with an affordable, deliverable, and technically appropriate strategy.
- Delivering a high-quality development that is adaptable to future changes in climate.
- Minimising the environmental impact of the development, both locally and globally.
- Achieving the highest possible levels of sustainable design and construction.
- Reducing emissions of pollutants such as Nitrogen Oxide [NO_x] and particulate matter.
- Creating a safe, comfortable, and adaptable living environment that meets the needs of future occupants.

Energy hierarchy

The purpose of the Energy Hierarchy is to demonstrate that climate change mitigation measures are a fundamental part of the development's design philosophy.

- Be Lean: Considers passive design and energy efficiency measures.
- Be Clean: Exploit local energy resources [such as secondary heat] and supply energy efficiently and cleanly.
- Be Green: Maximise opportunities for renewable energy producing, storing, and using renewable energy on-site.
- Be Seen: Implementing systems to monitor, verify, and report on energy performance



Planning policy and regulations

Relevant Local Policy – Horsham District Planning Framework – November 2015

- Chapter 10: Climate Change
- Policy 35: Climate change
- Policy 36: Appropriate Energy Use
- Policy 37: Sustainable Construction
- Policy 30: Flooding

- Chapter 11: Infrastructure, Transport and Healthy Communities
- Policy 40: Sustainable Transport

Relevant National Policy – NPPF

- Chapter 02. Achieving Sustainable Development
- Chapter 14. Meeting the challenge of climate change, flooding, and coastal change

Building Regulations

- Approved Document Part L
- Approved Document Part O
- Approved Document Part F
- Approved Document Part G

The latest version of the above documents has been used in each case.

Energy Strategy

This Energy Strategy has been developed by NuPlanet Sustainable Solutions, in collaboration with the client and design team, to ensure opportunities for minimising energy use and CO₂ emissions across the site are maximised through a fabric first approach.



Be Lean

The Be Lean stage of the Energy Hierarchy is a fundamental first step, focusing on reducing energy demand through efficiency measures. Minimising energy waste at design and operation levels can lead to significant reductions in carbon emissions and energy consumption.

Prioritising energy efficiency before incorporating low-carbon or renewable systems ensures that the design is optimised, embedding sustainability into the development from the outset.

As with all good design, the development follows a fabric first approach to ensure energy consumption is minimised before consideration is given to LZC and renewable technologies. The following improvements have been made over the notional building highlighting the commitment to tackle energy consumption through better building practices.

Table 02 highlights the proposed specification at the Be Lean stage.

TABLE 02		BE LEAN
U-VALUES [W/M²K]	GROUND FLOOR	0.13
	EXTERNAL WALLS	0.16
	ROOF	0.11
	WINDOWS	1.2 [0.50 G-VALUE]
	EXTERNAL DOORS	1.0 [0.50 G-VALUE]
THERMAL BRIDGING [PSI VALUES]		PSI VALUES TAKEN FROM TABLE R1 [SAP10 DOCUMENT]
AIR PERMEABILITY		4 M³/HR.M² @50PA
VENTILATION STRATEGY		NATURAL WITH DMEV FAN UNITS IN ALL KITCHENS AND WETROOMS
HEATING		GAS BOILER, RADIATORS, PROGRAMMER, ROOM STAT AND TRV'S
HOT WATER SYSTEM		100-210L DHW CYLINDERS WITH IMMERSION
RENEWABLES		NOT INCLUDED AT THIS STAGE

Building Design

Every effort will be made to optimise the orientation of the development, to maximise access to natural light and reduce artificial lighting and heating demand, whilst minimising potential for overheating throughout the development.

Thermal Envelope

A fabric first approach will be adopted to minimise energy consumption through passive design measures. The building fabric [walls, floors, and roofs] will be designed to exceed the minimum requirements of Building Regulations Part L.

Thermal Bridging

30% of heat loss can occur through thermal bridging through the building fabric. By adopting enhanced construction details throughout, further improvements in energy efficiency and emissions reductions will be achieved.

Air Permeability [Airtightness]

All new buildings are required to have air permeability tests on completion to confirm heat losses through uncontrolled ventilation [draughts]. To build on the higher standards of thermal efficiency in the building fabric, a target air permeability rate of 5m3/hr.m² has been set.

Fenestration

Windows and external doors will exceed the minimum requirements of Building Regulations Part L.

The size and orientation of glazed elements will be optimised to provide all interior space with a high standard of daylight, reducing reliance on artificial lighting.

This optimised approach also maximises solar gains during the winter months, whilst minimising overheating during the summer.

Ventilation

A full mechanical ventilation strategy (MEV or MVHR) will be adopted to ensure all ventilation requirements within the property are met.

Heating

For the purposes of the ‘Be Lean’ phase the heating is assumed to be provided by a gas boiler with programmer & room thermostats in line with the GLA Technical Guidance for Energy Strategies .

Domestic hot water [DHW]

The hot water demand in the ‘Be Lean’ section of the report is provided by a 100-260L cylinders with a heat loss efficiency of 1.7kWh/day.

The cylinders are fed by a dual immersion heater.

Lighting

Low energy, LED lighting with a minimum efficacy of 120lm/W will be used throughout to minimise the energy requirement for the artificial lighting systems. External and common area lighting will be linked to daylight or motion sensors to prevent unnecessary use.

Be Clean

Be Clean investigates how energy can be supplied efficiently to proposed developments by connecting sites to a heating or cooling network to further reduce carbon emissions. Due to the decarbonization of the electricity grid Combined Heat and Power systems [CHP] will not be considered as the use of these systems will create a net increase in carbon emissions.

District energy systems

There are no existing or planned Heat Networks within the vicinity of the development site.

Summary

Further reductions in emissions are unachievable at this stage, so the total reduction through the first two stages of the Energy Hierarchy remains as calculated at the Be Lean phase.

Table 03 highlights the proposed specification at the Be Clean stage.

TABLE 03		BE LEAN
U-VALUES [W/M²K]	GROUND FLOOR	0.13
	EXTERNAL WALLS	0.16
	ROOF	0.11
	WINDOWS	1.2 [0.50 G-VALUE]
	EXTERNAL DOORS	1.0 [0.50 G-VALUE]
THERMAL BRIDGING [PSI VALUES]		PSI VALUES TAKEN FROM TABLE R1 [SAP10 DOCUMENT]
AIR PERMEABILITY		4 M³/HR.M² @50PA
VENTILATION STRATEGY		NATURAL WITH DMEV FAN UNITS IN ALL KITCHENS AND WETROOMS
HEATING		GAS BOILER, RADIATORS, PROGRAMMER, ROOM STAT AND TRV'S
HOT WATER SYSTEM		100-210L DHW CYLINDERS WITH IMMERSION
RENEWABLES		NOT INCLUDED AT THIS STAGE

Be Green

Be Green encourages the incorporation of Low and Zero Carbon [LZC] & renewable technologies in a development to reduce site dependency on grid services and lower CO₂ emissions.

A feasibility study, set out over the next few pages, assesses the suitability of each technology for the development and whether they will be adopted as part of the final specification.

LZC Feasibility study

Air source heat pump [ASHP] ASHPs utilise the temperature difference between external and internal spaces. A heat exchanger is used to convert the extracted heat for use in heating and DHW. SUITABILITY Available space– ASHP systems will require external compressor units which could easily be accommodated within the site area. Suitable space will need to be provided for the storage and distribution of hot water across the development. PROPOSAL It is considered that an ASHP system would be an ideal solution for this development.	Proposed	Solar thermal [Hot Water] Solar thermal collectors provide hot water by utilising the energy present in sunlight to heat a collector; this is then transferred to a circulating fluid and used to heat hot water. SUITABILITY Potential – Solar thermal is considered a viable technology for the project due to the location and available roof area. PROPOSAL Other technologies may offer further benefits, so no system has been included at the preliminary design stage.	Suitable	Photovoltaics [PV] PVs generate electricity from sunlight. PV systems require accessible roof space for the system to be installed and function correctly. SUITABILITY Potential energy generation – A PV array on the proposed development would generate a proficient level of regular solar electricity due to the open surrounding allowing for minimal overshadowing, this would help running costs by reducing the need for grid electricity. PROPOSAL The most southerly facing roofs on each new dwelling will be fitted PV array of between 1.5kWp to 4kWp to help offset electric consumption on site.	Proposed	Biomass boiler Biomass boilers use a carbon neutral fuel source, such as wood pellets, to generate heat for hot water and space heating. These systems require significant space for both the boilers and storage of the fuel. SUITABILITY Available space – Biomass boiler systems will require a storage facility for the fuel and plant space, making it an unviable option for this project. There are several pros and cons for using this technology. Historically this type of system was regarded as a carbon neutral system that will generate the dwellings heat & hot water demand using largely waste material. However, more recent studies have confirmed that burning biomass fuel can lead to high pollution issues. PROPOSAL Biomass has been ruled out given limited space and high pollution issues.	Not Suitable
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LZC Feasibility study

Small scale wind turbines Whilst small scale wind turbines can produce a high degree of energy, this is dependent on a consistent flow of air which makes them difficult to design into most developments. SUITABILITY Available space – There is limited available space on the site to support a wind turbine. PROPOSAL Due to the highly complex requirements for a wind turbine installation to run efficiently, and the potential impact of reverberation and noise on the occupants this technology is not considered appropriate for the development	Not Suitable	Ground source heat pump [GSHP] GSHPs extract heat [or coolth] from the ground. Systems can be installed horizontally in the ground over a large area, or vertically in boreholes. A heat exchanger is used to convert the extracted heat for use in heating and DHW. SUITABILITY Available space – There is limited space for horizontal heat loops, but the site could support vertical borehole loops. GSHPs are regarded as a very efficient way to meet the heating & hot water demand of low energy buildings. PROPOSAL It is considered that a GSHP system is not suitable for this project due to the high installation costs that could impact the viability of the project.	Not Suitable	Exhaust air heat pump Exhaust air heat pumps are a commonly adopted technology for smaller dwellings with lower heat loss, such as flats. Heat is recovered from exhaust air extracted from the kitchen and bathrooms and used to heat the dwelling and hot water. They will also help the property meet ventilation requirements through a built in MEV or MVHR unit. SUITABILITY Available space – Exhaust air heat pumps will provide a heating, hot water and ventilation solution through a single internal unit, with no need for external plant, making them more suitable for flatted developments. PROPOSAL These systems normally have a built-in electric immersion heater or require an electric boiler to top up the heat demand, which is why they are more suited for efficient buildings to help keep running costs to a minimum. PROPOSAL It is considered that this technology would not be suitable due to the size of the proposed properties.	Not Suitable	Energy storage Energy storage allows for energy created on site to be captured and stored for use later, this would be achieved through the installation of an accumulator or battery system. Typically, these systems are paired with photovoltaics to maximise on-site energy use before electricity is exported back to the grid. SUITABILITY Battery storage is an ideal partner for PV, allowing solar electricity to be stored during periods when dwellings are unoccupied, for use when the occupant returns. PROPOSAL It is considered that battery storage could be viable in the future for the houses within this proposed development but have not been included at this time.	Proposed
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Be Green

The feasibility study has highlighted several appropriate Low or Zero Carbon Technologies [LZC] for the proposed development. The following are seen as the most appropriate technologies:

- Air source heat pump [ASHP]
- 1.5kWp to 4.00kWp PV array on the most southerly facing roofs

The specification used for this phase of the hierarchy is set out in the table opposite with changes to previous phases highlighted.

The PV systems will offset a portion of the energy demand through on-site generation, reducing the reliance on national grid supplied energy.

Table 04 highlights the proposed specification at the Be Green stage.

TABLE 04		BE GREEN
U-VALUES [W/M²K]	GROUND FLOOR	0.13
	EXTERNAL WALLS	0.16
	ROOF	0.11
	WINDOWS	1.2 [0.50 G-VALUE]
	EXTERNAL DOORS	1.0 [0.50 G-VALUE]
THERMAL BRIDGING [PSI VALUES]		PSI VALUES TAKEN FROM TABLE R1 [SAP10 DOCUMENT]
AIR PERMEABILITY		4 M³/HR.M² @50PA
VENTILATION STRATEGY		NATURAL WITH DMEV FAN UNITS IN ALL KITCHENS AND WETROOMS
HEATING		ASHP, UNDERFLOOR HEATING AND RADIATORS WITH PROGRAMMER AND ROOMSTAT
HOT WATER SYSTEM		ASHP FED 100-210L DHW CYLINDERS
RENEWABLES		1.5-4KWP PV ARRAY WILL BE FITTED TO THE MOST SOUTHERLY FACING ROOF ON EACH PROPOSED DWELLING

Be Seen

Monitoring and reporting

Energy display devices that monitor electricity consumption will be provided to each dwelling. These will be installed in a visible location such as a hallway or a kitchen. This can empower occupants to be more aware of their usage and therefore make energy and cost savings, where possible.

Operational cost

Considering operational costs for the end user is important when reviewing Energy Strategy options as the energy hierarchy focuses predominately on carbon emissions, which can lead to unintended consequences in the form of higher operational energy bills.

Each dwelling on the proposed development will be designed achieve a reduction in CO₂ emissions through passive design measures at the Be Lean stage, which in turn will result in lower heat demand, and savings in energy consumption and cost.

The Be Green stage of the Energy Strategy has highlighted that Air Source Heat Pumps and PV are the most suitable LZC technology, which will reduce dependency in grid electricity through onsite generation, resulting in financial savings to the end user.

Unregulated Energy

Unregulated energy includes electricity from devices like computers, entertainment appliances, washing machines, refrigeration, and cooking equipment. As Building Regulation Part L evolves, improving building efficiency, the proportion of unregulated energy use is expected to rise significantly compared to regulated energy.

Therefore, selecting and using appliances efficiently will become crucial for improving energy performance in homes and workplaces. Educating users on reducing energy consumption through equipment choices will also play a key role. This can be achieved through user guides offering advice on selecting energy-efficient white goods, energy-star-rated computers, and installing voltage optimization or power factor equipment.

Overheating

Consideration to the overheating of buildings during the Summer months has become more prominent in recent times and will continue to be so as Summers become warmer due to climate change.

In order to limit the risk of overheating, the cooling hierarchy should be followed. Mitigation measures are highlighted in Table 05.

The proposals will comply with Part O of the Approved Documents and will include a formal assessment at the Building Regulations stage.

TABLE 05

THE COOLING HIERARCHY	1: REDUCE THE AMOUNT OF HEAT ENTERING THE BUILDING	- GLAZING AREA, PARTICULARLY WEST AND SOUTH FACING, WILL BE MINIMISED WHERE POSSIBLE - LOW-E GLAZING WITH G-VALUE OF 0.50 COULD POTENTIALLY BE USED IN CONJUNCTION WITH SOLAR SHADING.
	2: MINIMISE INTERNAL HEAT GENERATION THROUGH ENERGY EFFICIENT DESIGN	- ALL PRIMARY PIPEWORK WILL BE INSULATED TO REDUCE HEAT LOSS. - LOW ENERGY LIGHTING TO BE INSTALLED THROUGHOUT. - HEAT DISTRIBUTION PIPEWORK LENGTHS TO BE MINIMISED.
	3: MANAGE HEAT WITHIN THE BUILDING THROUGH EXPOSED INTERNAL THERMAL MASS AND HIGH CEILINGS	CEILING HEIGHTS COULD BE MAXIMISED TO REDUCE HEAT BUILDUP.
	4: PROVIDE PASSIVE VENTILATION	- OPPOSING OPENING WINDOWS AND DOORS HAVE BEEN CONSIDERED WHERE POSSIBLE TO ALLOW FOR PASSIVE VENTILATION. - ROOFLIGHTS COULD BE INCORPORATED, WHERE POSSIBLE, WITHIN BEDROOMS TO ALLOW RISING HEAT TO ESCAPE.
	5: PROVIDE MECHANICAL VENTILATION	DECENTRALISED MECHANICAL VENTILATION UNITS ARE PROPOSED IN ORDER TO PROVIDE ADEQUATE VENTILATION INTERNALLY.
	6: PROVIDE ACTIVE COOLING SYSTEMS	THE USE OF ACTIVE COOLING SYSTEMS IS NOT INTENDED OR ENCOURAGED, AND SHOULD ONLY BE CONSIDERED ONCE PASSIVE MEASURES HAVE BEEN PRIORITISED,

Sustainability Strategy

The purpose of this section of the report is to demonstrate that this development is considered a high quality and sustainable development, as measured against relevant local and national planning policies.

The proposal is to create a high quality, highly sustainable development, which is sympathetic to the local area, whilst also considering its commitments to climate and environmental responsibility.

The following chapters of the report will help demonstrate how the proposed scheme has been designed to adapt to climate change through the incorporation of sustainable design and construction methods, energy and water saving measures, sustainable transport methods, waste reduction techniques, and measures to protect the ecological value of the site.



Flood risk & drainage

The risk of flooding in both rural & urban areas has increased over recent years through a mix of climate change bringing high levels of rain fall which are closer to 100-year storm levels, and extensive development of greenfield sites resulting in the reduction of permeable surfaces. This has led to increased surface water run-off into an already over loaded drainage system.

Flood Risk

The site is within Flood Zone 1 and is considered at low risk of flooding from groundwater which could be mitigated with an appropriate strategy that directs flows away from properties. Please refer to Figure 01.

Sustainable drainage design

The proposed Surface Water drainage strategy aims to restrict surface water discharge to the Qbar rate of 2l/s n accordance with best practise.

Attenuation and reduced discharge will be provided for all storm events upto and including the 1 in 100-year storm plus 40% allowance for climate change.

An additional 10% allowance for urban creep has been included in the sizing of surface water storage.

Attenuation is provided in below ground tanks with further SUDS measures including water butts and permeable paving.

Further information can be found in the Flood Risk Assessment and Drainage Strategy report prepared by Jomas Associates for this application.

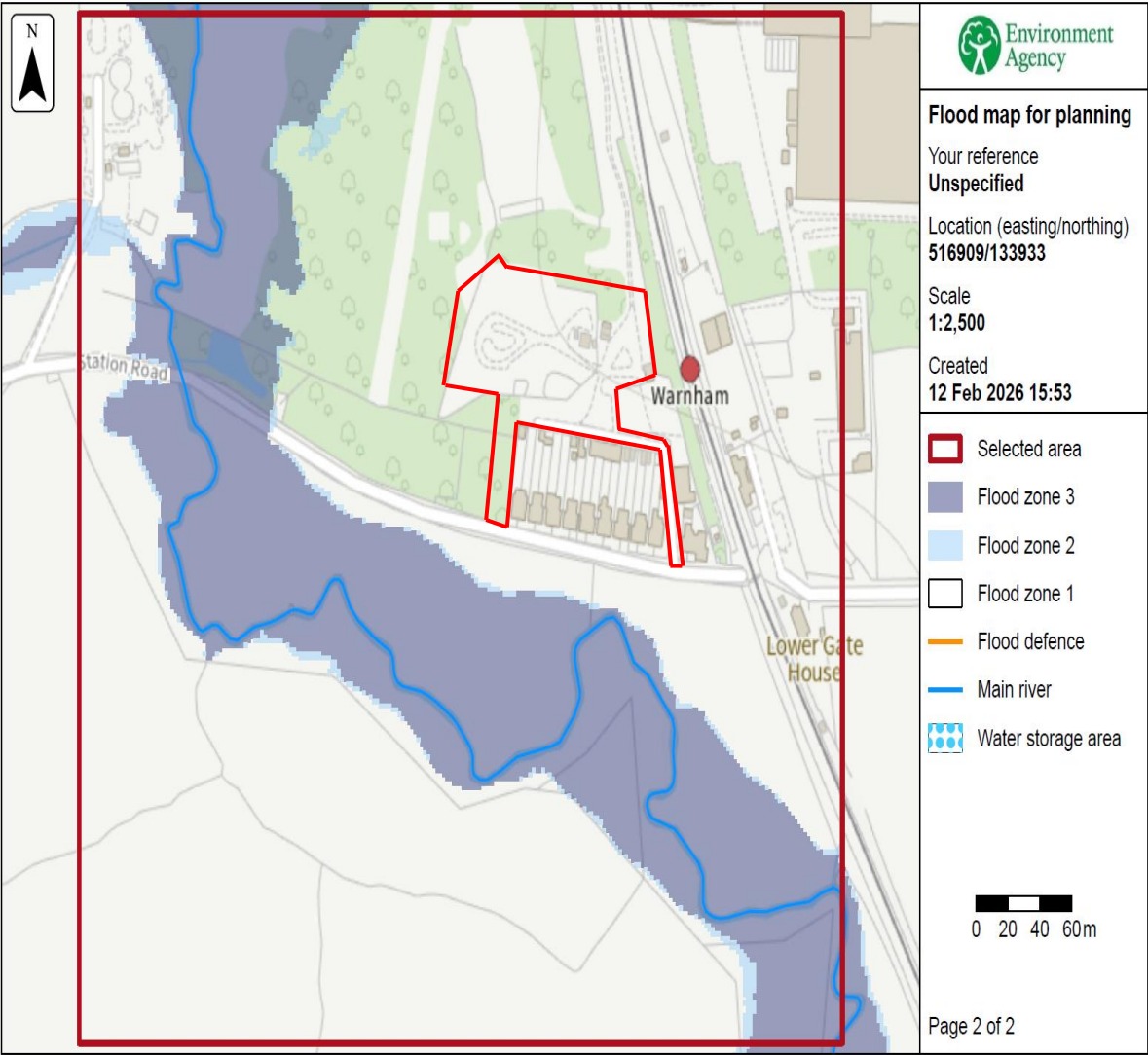


FIGURE 01 – FLOOD RISK MAP [GOV.UK]

Water consumption

Conserving water is crucial for sustainable development, as the processing of fresh drinking water consumes significant energy. Domestic water usage contributes approximately 35 million tonnes of CO₂ annually, averaging 1.5 tonnes per household. Additionally, climate change has led to more frequent and prolonged droughts in recent years.

Under Part G of the Building Regulations, new homes are required to limit water consumption to 125 litres per person per day [l/p/d], with an optional target of 110 l/p/d. The Horsham District Council Planning Policy mandates that all new dwellings achieve a minimum water efficiency of 110 l/p/d.

Table 06 outlines the flow and flush rate targets for sanitary fittings and appliances to ensure compliance with these water efficiency standards.

The Part G Water Use Calculator [following page] confirms the flow and flush rate targets will achieve a total water consumption figure of 104.85l/p/d.

TABLE 06	TARGET
DUAL FLUSH TOILET FLUSH RATE	6 / 3L
TAP FLOW RATE [BATHROOMS / ENSUITES / W.C.]	5L/MIN
TAP FLOW RATE [KITCHENS]	5L/MIN
BATH VOLUME TO OVERFLOW	170L
SHOWER FLOW RATES	87L/MIN
WASHING MACHINE CONSUMPTION	8.17L/KG OF WASHING
DISHWASHER CONSUMPTION	1.0L PER PLACE SETTING
TOTAL	105L/PERSON/DAY

Part G water efficiency calculator

INSTALLATION	UNIT OF MEASURE	CAPACITY / FLOW RATE	USER FACTOR	FIXED USE [L/PERSON/DAY]	L/PERSON/DAY
W.C. [SINGLE FLUSH]	FLUSH VOLUME [LITRES]	0.00	4.42	0.00	8.76
W.C.[DUAL FLUSH	FULL FLUSH VOLUME [LITRES]	6.00	1.46	0.00	0.00
	PART FLUSH VOLUME [LITRES]	3.00	2.96	0.00	0.00
W.C [MULTIPLE FITTINGS]	AVERAGE FLUSHING VOLUME [LITRES]	0.00	4.42	0.00	9.48
TAPS [EXCLUDING KITCHEN / UTILITY]	FLOW RATE [LITRES / MINUTE]	5.00	1.58	1.58	18.7-
BATH	CAPACITY TO OVERFLOW	170.00	0.11	0.00	30.59
SHOWER	FLOW RATE [LITRES / MINUTE]	7.00	4.37	0.00	0.00
BATH [ONLY]	CAPACITY TO OVERFLOW	0.00	0.50	0.00	0.00
SHOWER [ONLY]	FLOW RATE [LITRES / MINUTE]	0.00	5.60	0.00	12.56
KITCHEN / UTILITY TAPS	FLOW RATE [LITRES / MINUTE]	0.00	0.44	10.36	17.16
WASHING MACHINE	LITRES / KG DRY LOAD	8.17	2.10	0.00	3.60
DISHWASHER	LITRES / PLACE SETTING	1.00	3.60	0.00	0.00
WASTE DISPOSAL	LITRES / USE	0.00	3.08	0.00	0.00
WATER SOFTENER	LITRES / PERSON / DAY	0.00	1.00	0.00	109.73
				TOTAL CALCULATED USE	0.00
				CONTRIBUTION FROM GREYWATER [LITRES / PERSON / DAY]	0.00
				CONTRIBUTION FROM RAINWATER [LITRES / PERSON / DAY]	0.00
				NORMALISATION FACTOR	0.91
				TOTAL INTERNAL WATER CONSUMPTION	99.85
				EXTRENAL WATER USE	5.00
				TOTAL WATER CONSUMPTION	104.85

White goods

The EU Energy Labelling Scheme was updated in March 2021 and now uses A to G rankings only, instead of A+++ to D ratings as before.

The new regulations incorporate updated standards with stricter performance requirements and calculations, making it easier to compare efficiency across products.

The proposed development will set the following minimum standards:

- Fridges, freezers, and fridge-freezers – C rating
- Washing machines – C rating
- Dishwashers – C rating

Lighting

Quality lighting design enhances comfort and well-being in both homes and workplaces. The proposed development will ensure adequate lighting access and control within the dwelling, contributing to healthy living.

Lighting levels will adhere to CIBSE and SLL guidelines, with targets outlined in Table 07.

All internal lighting will be energy-efficient, with a maximum average wattage of 10W/m² and luminous efficacy above 120 lumens per circuit watt.

External and communal lighting will be controlled via motion sensors, dusk-to-dawn sensors, and timers.

TABLE 07	LUX LEVELS
ENTRANCE LOBBIES AND STAIRWELLS	150
KITCHENS	500
LIVING SPACE	200
BATHROOMS	200
BEDROOMS	150
HOME OFFICE	500
CIRCULATION SPACE AND STORES	100

Sustainable transport

The applicant has commissioned Mode Transport Planning to undertake a Transport assessment in support of the planning application. There is a commitment by the applicant to ensure that a sustainable transport policy is adopted.

Sustainable transport links play a key role in the sustainability conversation, contributing positively to both environmental and economic well-being in the areas they serve.

By providing alternative transport options and associated facilities, we can reduce reliance on fossil fuel-powered cars, yielding several benefits:

- Promoting active travel, which enhances health and well-being.
- Reducing congestion and improving air quality through cleaner travel.
- Offering cost savings compared to the maintenance and operation of traditional vehicles.

The site is within walking / cycling distance to the Warnham, providing local amenities, including a primary school and local shops, with larger supermarkets, library, and medical [Doctor & dentist] services available in nearby Horsham.

Public transport

The site is in approximately 50m from Warnham Station, which provides onward links to London and Horsham (5 minutes journey).

Cycling and walking

The site is located within walking / cycling distance to Warnham. Whilst there are no dedicated cycle paths, the local single carriageway is regarded as proficient to cyclists due to low traffic volumes.

The nearest local cycle path to the site is Shelley Bicycle Trail, which extends from Bell Road into the centre of Horsham.

It is anticipated that cycle storage will be included within each dwelling at the detailed design stage.

Electric Vehicle [EV] charging

Where associated parking spaces are provided for new dwellings, EV charging will be installed in line with Approved document Part S requirements.

Pollution

Noise Pollution

The Applicant is committed to reducing noise disturbance to internal and external areas of dwellings to improve the health and wellbeing of the occupants and to help protect community cohesion.

The impact of breakout noise on the surrounding environment can be reduced and absorbed through an effective planting programme.

Air Quality

Poor air quality is the greatest environmental risk to public health in the UK and is known to exacerbate the impact of pre-existing health conditions. It is not only a major risk to human health but also has significant damaging impacts on both plants and animals.

Between 1990 and 2017, the UK’s estimated emissions of nitrogen oxides reduced by 70%, and the estimated emissions of PM10 particulate matter reduced by 55% (DEFRA, 2019). This must continue to fall in future years. The applicant is committed to reducing the proposed development’s negative impact on air quality during construction and operation.

Air Quality Consultants, [Quantum Air], have been commissioned to undertake an Air Quality Assessment for the development. The assessment has reviewed the local pollutant monitoring and UK-AIR background data, which suggests air pollutant concentrations for the proposed development are well below the current legislated AQOs and LVs.

The assessment reviews the impact the construction phase might have on the site and surrounding area and suggests mitigation measures that could be adopted to reduce the impact onsite activities would have on air quality.

The assessment also reviews the predicted air quality at the operational phase, considering air pollution from building operation and traffic across the site. The report confirms that no operational mitigation measures are required, and whilst there will be some transport across the site, it is regarded to have negligible impact.

The report confirms the overall air quality assessment demonstrates that the development site is suitable for the proposed residential use, with the air impact due to the proposed development are considered to be not significant, meeting regulatory standards.

Please refer to the Air Quality assessment report for further details.

Ventilation

To avoid problems associated with the build-up of pollutants and humidity levels within the dwellings, whilst avoiding excessive heat loss, ventilation will be designed to meet the requirements of Approved Documents L & F.

Light Pollution

Lighting pollution is a 20th century problem, created by the adoption of poor design and installed electric lighting. It can have a disruptive impact on both diurnal and nocturnal wildlife, contributes to CO² emissions, disrupts human sleep, and obscures the stars in the night sky.

The development is committed to reducing the effect of light pollution by following Dark Skies design principles to minimise the impact on the night-time sky.

A compliant design will be developed at the detailed design stage for all private space and security lighting.

All street lighting will be designed in accordance too the Institution of Lighting Professionals [ILP] best practise dark sky Design principles at detailed design stage.



Design criteria for external lighting:

- Lights will provide downlighting only.
- Wall lights will have a 36-degree beam angle and be mounted no higher than 1500mm from the floor.
- Ramp and step lighting will illuminate only the deck or tread.
- Lighting will offer warm light [3000K] with a maximum illuminance of <500 Lux.
- Controls will include dusk-to-dawn sensors and timers to limit usage.
- Lighting will be fitted with a master switch to allow all external lighting to switched off when the site is not occupied.
- All windows to be fitted with curtains / shades to reduce light pollution

Sustainable materials

Responsible sourcing of materials

Whilst not a component of UK planning or building regulations legislation, material choice can have a significant effect on the carbon footprint of a development.

The applicant is committed to minimising the developments environmental impact through best practice procurement management.

All timber products will be sourced from FSC or PEFC sources, with all other materials to be purchased from suppliers/manufacturers that have an accredited Environmental Management System [EMS] [BES6001, ISO14001 or BS8555] for the extraction and manufacturing process of the proposed material.

Green Guide rated materials

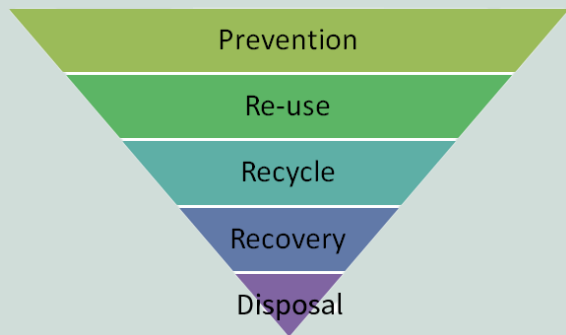
All construction materials will be considered to maximise the selection of materials with low embodied energy that score highly in the Building Research Establishment (BRE) Green Guide for Building Specification.



Waste management

Reduce, reuse, recycle

Waste reduction and recycling is another key challenge of sustainable development. The Waste Hierarchy below illustrates the priorities waste management should follow to reduce impact on the environment.



Household waste management

The applicant is committed to following the above waste hierarchy to help reduce waste sent to landfill.

Suitable internal storage containers for household waste will be provided in each dwelling; containers will allow for waste and recycling separation to encourage sustainable recycling habits by the occupants.

Adequate storage is to be provided throughout the site, where both recyclable and non-recyclable waste can be stored in accordance with Horsham District Council waste collection service.

Composting

Managing green waste through onsite composting allows some kitchen and garden waste to be re-used to enrich the soil, whilst also reducing CO₂ emissions by limiting the need to transport waste from site. It is proposed to include composting bins in the gardens of each house.

An internal 8l caddy bin will also be provided in each new dwelling along with an information leaflet outlining what should and should not be composted.



Build Quality

Security

The applicant is committed to ensuring the development is safe & secure for the residents, which will reduce the fear of crimes being committed and the risk and associated costs of crime.

Sound insulation

To reduce the likelihood of noise complaints and to ensure a high-quality development is created, the development will be aiming to achieve airborne sound insulation values that will improve upon the performance standards outlined in Building Regulation Approved Document Part E.

Inclusive design

All new dwellings will be designed in-line with Approved Document M4[1] requirements. These standards will ensure accessible and adaptable accommodation for everyone, regardless of age, mobility, or disability.

This approach provides flexibility and futureproofing, allowing the accommodation to adapt to changing needs and technologies.

In light of recent global events, the design includes provisions for remote working, with dedicated space, extra power sockets, and reliable Wi-Fi connectivity as per Approved Document Part R.

Daylight & Sunlight

The promotion of good daylighting levels contributes to sustainability through improving the occupant’s quality of life and reducing the building’s energy consumption by minimising the need for artificial lighting.

The layout of the Proposed Development has been carefully designed to optimise the daylight and sunlight quality within the home.



Health & Wellbeing

Internal air quality

Air quality in modern homes is becoming a bigger consideration in new development design. The reality is that poor air quality will impact on the homeowner's health, leading to respiratory illnesses.

All internal and external finishes within the development will aim to have low volatile organic compound [VOC] content.

Amenity space

Providing private and public amenity space is a key consideration in modern development. Flexible external space is important to allow fitness and leisure activities to take place, which will encourage health and wellbeing.

Private

Each new house will benefit from either its own private garden or a shared garden which can be accessed from the dwelling through a level threshold door.

The private gardens will allow the homeowner to undertake a range of activities such as growing their own vegetables, play & exercise space, and outdoor cooking, within a secure and safe environment.

Ecology

Existing Ecological value

Ecoserv Ltd were commissioned to carry out a preliminary ecological assessment on the existing site, which confirmed the majority of the land proposed for development is of low ecological value.

Further ecology surveys and impact assessment will be required to help formulate a suitable mitigation strategy.

The report highlights any require licences and monitoring either before or during the construction phase.

Enhanced Ecological value

The applicant has committed to improving the ecological value of the site by following the recommendations mitigation measures set out in the Ecology Report in association with the proposed landscape design.

Mitigation and enhancement measures include:

- A sensitive lighting scheme to avoid direct disturbance to foraging and commuting bats, birds and mammals
- Set suitable periods for tree felling and habitat clearance to avoid nesting birds
- Pollution, prevention and control measures to avoid impact on adjacent habitats during construction phase
- The incorporation of bird nesting boxes within the new structures
- The integration of bat boxes to support roosting bats at the post development stage
- Habitat piles for shelter and hibernation

Biodiversity Net Gain

Biodiversity Net Gain Assessment will be provided through off-site provision.

Further information on the ecology evaluation and Biodiversity net gain can be found in the Ecology & Biodiversity Net Gain Assessment reports accompanying this application.

Reducing construction impact

Minimising Development Impact on the Community

To ensure seamless integration into the local area, minimising the development's impact on the neighbouring community is a priority.

Construction Site Impact Monitoring

During construction, measures will be implemented to control noise, dust, and debris on roads. These procedures, approved by the development team, will be backed by commercial agreements to ensure compliance.

Additional steps will limit air and water pollution following best practices. Construction traffic will be managed by restricting delivery times, and noise will be minimised from construction activities. Work hours will be agreed upon with the council to further reduce impact on surrounding residents.

Construction Waste Management

Construction waste accounts for approximately 40% of all waste. To reduce landfill contributions, two main strategies will be employed:

- Efficient construction methods and management
- Re-use and recycling of materials on-site

A Site Waste Management Plan [SWMP] will be developed, setting targets for waste minimisation through efficient material ordering and waste segregation.

Site waste segregation streams

- Mix construction, and demolition waste
- Mixed concrete, brick, tiles and ceramics
- Mixed metal
- Plasterboard
- Hazardous
- Soil and Stone
- Waste paint and varnish
- Wooden packaging
- Plastics
- Paper/cardboard

Conclusion

The purpose of this Energy & Sustainability strategy is to demonstrate that the proposed development on land to the north of Station Road, Warham, is a sustainable development, as measured against relevant local and national planning policies.

The applicant is applying for Outline planning permission for the erection of up to 24 dwellings with all matters reserved except for access.

Whilst this remains an outline planning application, this report demonstrates the applicant’s commitment to deliver a sustainable development through the incorporation of sustainable design and construction methods, energy and water saving measures, sustainable transport methods, waste reduction techniques, and measures to enhance the ecological value of the site, a high quality and sustainable development is proposed.

Through early consideration to an energy efficient design and specification, the proposed development will satisfy the requirements of national and local Planning Policies and Building Regulation Part L1 2021 requirements.

The proposal aims to deliver a high-quality, sustainable development through eco-friendly design, energy and water efficiency, sustainable transport, waste reduction, and enhanced ecological value.

KEY FEATURES	
–Low carbon heating & hot water systems throughout	–Enhanced ecology through compensatory planting, wildlife friendly measures
–Maximum internal water consumption of 110l/pp/day	–A biodiversity Net Gain through off-site provision
–Segregated bins for refuse, and recycling	
–Use of materials with low environmental impact	
–Provision of cycle storage and electric vehicle charging points for all units	

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