

The Martlets, Burgess Hill

Energy and Sustainability Statement

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THE MARTLETS, BURGESS HILL ENERGY AND SUSTAINABILITY ISSUED

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1. EXECUTIVE SUMMARY

This report considers the energy and sustainability measures to be incorporated within the redevelopment of the Martlets Shopping Centre, located in Burgess Hill town centre. This document complies with the requirements at both national and local level, as set out in the National Planning Policy Framework (2025) and Mid Sussex District Plan (2014-2031).

The recommended sustainability features for the proposed development, based on a Part L-compliant SBEM model, will allow a 2.38% carbon reduction for the commercial part of the development compared to a baseline Part L1 2021-compliant building, and a 61.25% carbon reduction for the residential part of the development compared to a baseline Part L2 2021-compliant building. This development is compliant with The Mid Sussex District Plan through the use of passive measures and an air source heat pump which will result in an overall of 82.07 tonnes (45.13%) carbon reduction for the entire development.

The energy and carbon savings are to be achieved through passive design, energy efficient measures incorporating design features such as energy efficient lighting, submetering of relevant areas, upgrading of 'U' values and occupancy sensing in relative areas, as well as the incorporation of an Air Source Heat Pump.

To reduce the energy demand of the development as well as help to conserve water resources within the local area, it is anticipated that the fit-out works will provide for sanitary fittings which will be water efficient through measures such as dual flush toilets and low flow taps.

The Proposed Development will also prioritise sustainable modes of transport. The location of the site makes it easy to access via public transport. Additionally, it is anticipated cycle storage facilities will be provided in order to allow for the reduction of car-based travel and transport related pollution.

The incorporation of these sustainability measures allows for the proposed development to be deemed sustainable whilst targeting compliance with local and national policy.

This report includes annualised baseline calculations which predict the likely energy consumption and associated CO₂ emissions for this development. The total "Be Green" energy and carbon emissions for the development based on the Part L 2021, taking into account regulated energy demands are:

	<i>Be Green Tonnes CO₂/Annum</i>	<i>Be Green kWh/Annum</i>
Hotel & Retail development based on Part L1 2021	48.63	344,475.65
Residential development based on Part L2 2021	51.18	237,651.83

Table 1.1 Predicted Be Green Carbon and Energy Emissions

Proposed Energy Strategy for the Martlets Shopping Centre Development:

In summary the energy strategy comprises of:

- Passive Design and Energy Efficient Measures (Section 8.0)
- Air Source Heat Pumps (Section 10.0)

The strategy takes into consideration the site layout and requirements for the building type to produce a design that incorporates the most appropriate technologies available to the site. This provides a scheme that is commercially viable whilst targeting compliance with all policies applicable to this development.

This review has resulted in the formation of an Energy Strategy to be adopted for the development which involves the use of passive design and energy efficiency measures, and the use of ASHP.

The energy strategy for the development is shown in Table 1.2 below.

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Energy Strategy for the Travelodge Hotel and Commercial Unit	
Heating	❖ Travelodge Hotel: VRF System within the Bedroom, Bath, Reception, Restaurant and office area, and electric panel heaters within the circulation area's ❖ Commercial Unit: ASHP as per future fitout for shell and core unit
Cooling	❖ Travelodge Hotel: VRF System within the Bedroom, Bath, Reception, Restaurant and office areas. ❖ Commercial Unit: ASHP as per future fitout for shell and core unit
Hot water (DHW)	❖ Travelodge Hotel: Air Source Heat Pump with seasonal efficiency of 3.65
Ventilation	Extract system provided in WC's MVHR's within the Restaurant, Kitchen and office area
Lighting	Energy efficient LED lighting where applicable
Energy Strategy for the Residential Block	
Heating	Communal air source heat pump (ASHP) system provides low-temperature hot water to apartments for space heating via Heat Interface Units (HIUs)
Hot water (DHW)	Domestic hot water is supplied to each apartment through the ASHP system and HIUs
Ventilation	Mechanical Ventilation with Heat Recovery (MVHR) systems installed in all apartments to improve indoor air quality and reduce heat loss
Lighting	Energy-efficient LED lighting installed throughout apartments

Table 1.2 Proposed Energy Strategy for the development

Tables 1.3 – 1.6, highlight the carbon and energy savings that are currently anticipated for the development from a base Part L 2021 compliant build.

Travelodge Hotel and Commercial Unit		
Development	Predicted Energy Consumption (kWh/Annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	350,513.05	175,256.52
After Passive + ASHP measures	344,475.65	-
Residential Block		
Baseline: Part L 2021 of the Building Regulations Compliant Development	871,117.10	245,619
After Passive + ASHP measures	237,651.83	

Table 1.3 Predicted Energy Consumption

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Travelodge Hotel and Commercial Unit		
Development	Regulated Energy Savings	
	kWh/Annum	%
Savings from Passive + ASHP	8,749.17	2.48%
Residential Block		
Savings from Passive + ASHP	633,465.27	72.72%
Total Cumulative Saving	642,214.44	52.45%

Table 1.4 Regulated Energy Savings

Travelodge Hotel and Commercial Unit		
Development	Carbon Dioxide Emissions (Tonnes/Annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	49.81	19.92
After Passive + ASHP measures	48.63	-
Residential Block		
Baseline: Part L 2021 of the Building Regulations Compliant Development	132.07	129
After Passive + ASHP measures	51.18	

Table 1.5 Predicted Carbon Emissions

Travelodge Hotel and Commercial Unit		
Development	Regulated Carbon Dioxide Emissions	
	Tonnes/Annum	%
Savings from Passive + ASHP	1.18	2.38%
Residential Block		
Savings from Passive + ASHP	80.89	61.25%
Total Cumulative Saving	82.07	45.13%

Table 1.6 Regulated Carbon Emissions Savings

The development shall have an anticipated CO₂ improvement of 45.13% beyond Part L 2021, complying with local policy requirements. The energy and carbon calculations for the development at each stage (baseline, passive measures and ASHP), are displayed in full within Appendix C. Furthermore, sample BRUKL documents for the development are displayed in Appendix D.

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2. INTRODUCTION

This report, prepared by Cudd Bentley Consulting Ltd, examines energy and sustainability aspects of the proposed Martlets Shopping Centre redevelopment. The project involves converting the shopping centre into a ground-floor commercial unit with a Travelodge hotel on the upper floors and residential apartments.

Government policies now require significant energy reductions from proposed buildings. Building a greener future sets a planned trajectory outlined via Part L 2021 of the Building Regulations. These commitments have been the key focus point in addressing policies and strategies to reduce energy use and carbon emissions through energy efficiency and low or zero carbon technologies (LZC).

In line with best practice the following approach has been adopted in forming the energy statement for the development:

1. To propose to improve the building fabric from minimum Part L 2021 Building Regulations requirements; (BE LEAN)
2. To propose to reduce energy consumption and carbon dioxide emissions through passive and energy efficiency measures; (BE LEAN)
3. Investigate the feasibility of connecting into an existing district heat network and where this is not available investigate the feasibility of providing a central CHP Plant to serve the base heating and hot water requirements for the development; (BE CLEAN)
4. To propose to reduce energy consumption and carbon dioxide emissions further through the use of on-site renewable / LZC energy technologies. (BE GREEN)

The recommended strategy takes into consideration the site layout and requirements for the building to produce a design that incorporates the most appropriate technologies available to the site that are commercially viable, whilst targeting compliance with all policies applicable to this development.

The general floor layout and elevation of the proposed development can be seen below.

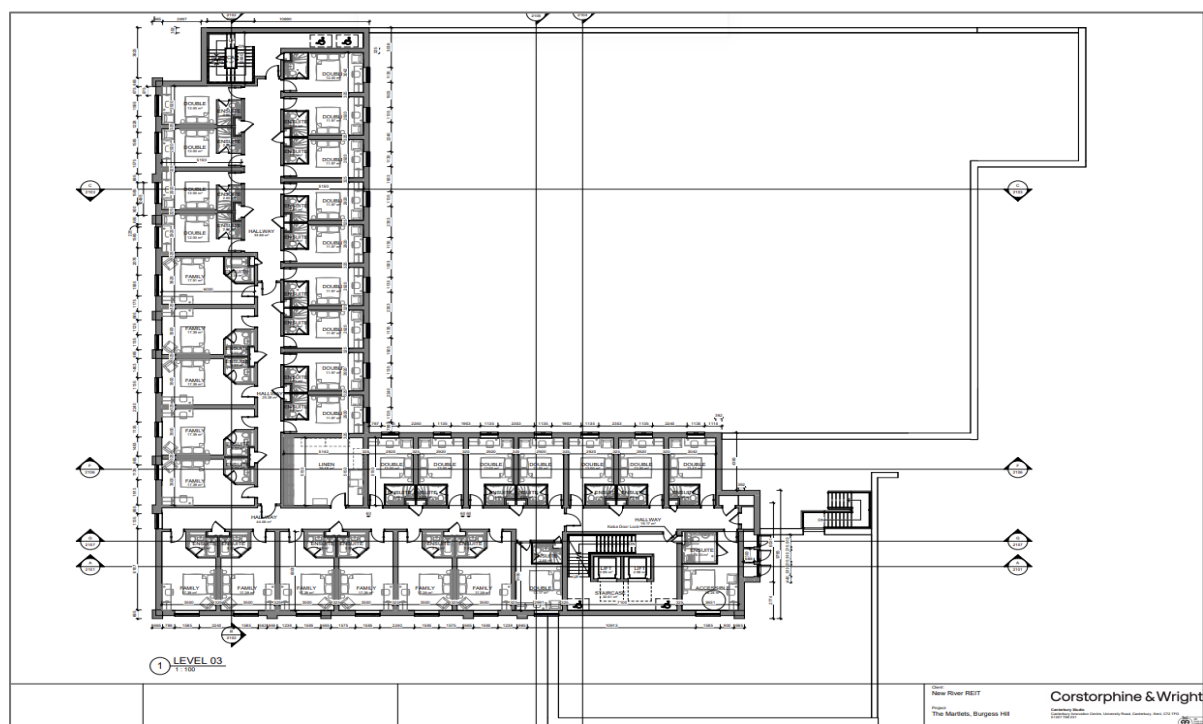


Figure 2.1: Level 03 Floor Plan of Hotel

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Figure 2.2: West Elevation of the development

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3. DRIVERS OF SUSTAINABILITY

The term Sustainable Development, is defined by the Department for the Environment, Food and Rural Affairs as:

‘... making sure people throughout the world can satisfy their basic needs now, while making sure that future generations can also look forward to the same quality of life. It recognises that the “three pillars” – economy, society and environment – are interconnected.’



To achieve this objective of sustainable development in any industry, sector strict regulations have been put in place that have filtered down through EU Directives from the European Climate Change Programme, to National UK Acts such as the Climate Change Act 2008, to Local Policy in the form of Core Strategies. However, there

are larger drivers behind the concept of sustainable development.

Kyoto Protocol

In 1997, the Kyoto Protocol was adopted as part of the United Nations Framework Convention on Climate Change, to which the UK is a signatory. The key feature of the protocol was the binding targets that were set for industrialised countries to reduce their Green House Gas emissions by 12.5% below 1990 levels by 2008-2012.

Cancun Agreements

Since the initial adoption of the Kyoto Protocol, extensive research has been put forward as to the causes and markers of climate change from the Intergovernmental Panel on Climate Change, which has led to new targets and objectives being made. In 2012, the international community met to discuss new directions for responding to climate change by adopting new agreements. The key objectives of the Cancun Agreements are:

- *Establish clear objectives for reducing human-generated greenhouse gas emissions over time to keep the global average temperature rise below two degrees;*
- *Mobilise the development and transfer of clean technology to boost efforts to address climate change, getting it to the right place at the right time and for the best effect;*
- *Assist the particularly vulnerable people in the world to adapt to the inevitable impacts of climate change;*
- *Protect the world's forests, which are a major repository of carbon;*
- *Establish effective institutions and systems which will ensure these objectives are implemented successfully.*

COP21: Paris Global Climate Agreement

In December 2015, a global climate deal was reached in a summit involving all of the world's nations. The targets of this aimed principally to curb the dangerous levels of climate change and drive an increase low-carbon infrastructure investment. Numerous organisations and corporations also committed to helping create a greener future by making their own pledges through the course of the summit. The key elements of the agreement are:

- *To keep global temperatures "well below" 2.0°C above pre-industrial times and "endeavour to limit" them even more, to 1.5C*
- *To limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100*
- *To review each country's contribution to cutting emissions every five years so they scale up to the challenge*
- *For rich countries to help poorer nations by providing "climate finance" to adapt to climate change and switch to renewable energy.*

BRE's COP21 Climate Pledge (December 2015)

"We commit to continue to drive best practice and carbon reduction, as we have through the use of BREEAM for the past 25 years. By reaching over 9,000 BREEAM rated buildings we predict emissions savings will be in excess of 900,000 tonnes of CO₂, compared to regulatory minimum performance requirements, by 2020. Saving not only carbon, but bringing wider benefits to both the owner and occupiers."

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4. NATIONAL POLICY

National Planning Policy

An effective planning system is required to contribute to achieving sustainable development. The **National Planning Policy Framework (NPPF)**, 2025, outlines what the government deems as sustainable development in England.

Sustainable development is defined as having the following three overarching objectives which are interdependent and need to be pursued in mutually supportive ways: an economic objective, a social objective, and an environmental objective.

1. Economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
2. Social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
3. Environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

The above objectives can be described as an energy trilemma, this is demonstrated in Figure 4.1 below. Each dimension is dependent on each other and sustainable development proposals should adhere to each role. This energy statement shall ensure the proposed Development is one that contributes economically, socially and environmentally in accordance with the NPPF, 2025.

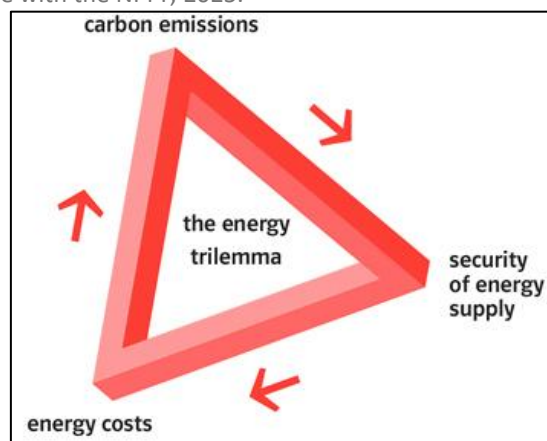


Figure 4.1 The Energy Trilemma

Guidance has been followed from the (NPPF), 2025, to provide an energy strategy which reduces energy use and carbon emissions, in line with best practice. This will provide a balanced scheme which focuses on optimal use of non-renewable resources (energy efficiency measures) whilst providing a renewable energy strategy best suited to the sites and their building uses. Below are some key extracts relevant to the development from Chapter fourteen 'Meeting the Challenge of Climate Change, Flooding & Coastal Change':

Paragraph 162

Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating and drought from rising temperatures. Policies should support appropriate measures to ensure the future health and resilience of communities and infrastructure to climate change impacts, such as providing

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space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.

Paragraph 164

New development should be planned for in ways that:

- a. avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through incorporating green infrastructure and sustainable drainage systems; and
- b. help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings in plans should reflect the Government's policy for national technical standards.

Paragraph 165

To help increase the use and supply of renewable and low carbon energy and heat, plans should:

- a. provide a positive strategy for energy from these sources, that maximises the potential for suitable development, and their future re-powering and life extension, while ensuring that adverse impacts are addressed appropriately (including cumulative landscape and visual impacts);
- b. consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and
- c. identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

Paragraph 166

In determining planning applications, local planning authorities should expect new development to:

- a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and
- b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

Paragraph 167

Local planning authorities should also give significant weight to the need to support energy efficiency and low carbon heating improvements to existing buildings, both domestic and non-domestic (including through installation of heat pumps and solar panels where these do not already benefit from permitted development rights). Where the proposals would affect conservation areas, listed buildings or other relevant designated heritage assets, local planning authorities should also apply the policies set out in chapter 16 of this Framework.

Paragraph 168

When determining planning applications for all forms of renewable and low carbon energy developments and their associated infrastructure, local planning authorities should:

- a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and give significant weight to the benefits associated with renewable and low carbon energy generation and the proposal's contribution to a net zero future;
- b) recognise that small-scale and community-led projects provide a valuable contribution to cutting greenhouse gas emissions;
- c) in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site.

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Paragraph 181

When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- d) any residual risk can be safely managed; and
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

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5. PLANNING POLICY

This section aims to highlight guidance available and the minimum requirements at local level from the Mid Sussex District Plan (2014-2031) adopted March 2018.

5.1. MID SUSSEX DISTRICT PLAN (2014-2031)

DP39: Sustainable Design and Construction

All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:

- Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation;
- Explore opportunities for efficient energy supply through the use of communal heating networks where viable and feasible;
- Use renewable sources of energy;
- Maximise efficient use of resources, including minimising waste and maximising recycling/ re-use of materials through both construction and occupation;
- Limit water use to 110 litres/person/day in accordance with Policy DP42: Water Infrastructure and the Water Environment;
- Demonstrate how the risks associated with future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer-term resilience

DP38: Biodiversity

Biodiversity will be protected and enhanced by ensuring development:

- Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure, so that there is a net gain in biodiversity, including through creating new designated sites and locally relevant habitats, and incorporating biodiversity features within developments; and
- Protects existing biodiversity, so that there is no net loss of biodiversity. Appropriate measures should be taken to avoid and reduce disturbance to sensitive habitats and species. Unavoidable damage to biodiversity must be offset through ecological enhancements and mitigation measures (or compensation measures in exceptional circumstances); and
- Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience; and
- Promotes the restoration, management and expansion of priority habitats in the District; and
- Avoids damage to, protects and enhances the special characteristics of internationally designated Special Protection Areas, Special Areas of Conservation; nationally designated Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty; and locally designated Sites of Nature Conservation Importance, Local Nature Reserves and Ancient Woodland or to other areas identified as being of nature conservation or geological interest, including wildlife corridors, aged or veteran trees, Biodiversity Opportunity Areas, and Nature Improvement Areas.

Designated sites will be given protection and appropriate weight according to their importance and the contribution they make to wider ecological networks.

Valued soils will be protected and enhanced, including the best and most versatile agricultural land, and development should not contribute to unacceptable levels of soil pollution.

Geodiversity will be protected by ensuring development prevents harm to geological conservation interests, and where possible, enhances such interests. Geological conservation interests include Regionally Important Geological and Geomorphological Sites.

DP21: Transport

Development will be required to support the objectives of the West Sussex Transport Plan 2011- 2026, which are:

- A high-quality transport network that promotes a competitive and prosperous economy;

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- A resilient transport network that complements the built and natural environment whilst reducing carbon emissions over time;
 - Access to services, employment and housing; and
 - A transport network that feels, and is, safer and healthier to use. To meet these objectives, decisions on development proposals will take account of whether:
 - The scheme is sustainably located to minimise the need for travel noting there might be circumstances where development needs to be located in the countryside, such as rural economic uses (see policy DP14: Sustainable Rural Development and the Rural Economy);
 - Appropriate opportunities to facilitate and promote the increased use of alternative means of transport to the private car, such as the provision of, and access to, safe and convenient routes for walking, cycling and public transport, including suitable facilities for secure and safe cycle parking, have been fully explored and taken up
- The scheme is designed to adoptable standards, or other standards as agreed by the Local Planning .
- Where practical and viable, developments should be located and designed to incorporate facilities for charging plug-in and other ultra-low emission vehicles

DP41: Flood Risk and Drainage

Proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increase the risk of flooding elsewhere. The District Council's Strategic Flood Risk Assessment (SFRA) should be used to identify areas at present and future flood risk from a range of sources including fluvial (rivers and streams), surface water (pluvial), groundwater, infrastructure and reservoirs. Particular attention will be paid to those areas of the District that have experienced flooding in the past and proposals for development should seek to reduce the risk of flooding by achieving a reduction from existing run-off rates.

Sustainable Drainage Systems (SuDS) should be implemented in all new developments of 10 dwellings or more, or equivalent non-residential or mixed development unless demonstrated to be inappropriate, to avoid any increase in flood risk and protect surface and ground water quality. Arrangements for the long term maintenance and management of SuDS should also be identified.

For the redevelopment of brownfield sites, any surface water draining to the foul sewer must be disconnected and managed through SuDS following the remediation of any previously contaminated land.

SuDS should be sensitively designed and located to promote improved biodiversity, an enhanced landscape and good quality spaces that improve public amenities in the area, where possible.

The preferred hierarchy of managing surface water drainage from any development is:

1. Infiltration Measures
2. Attenuation and discharge to watercourses; and if these cannot be met,
3. Discharge to surface water only sewers.

Land that is considered to be required for current and future flood management will be safeguarded from development and proposals will have regard to relevant flood risk plans and strategies.

DP29: Noise, Air and Light Pollution

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Noise pollution:

- It is designed, located and controlled to minimise the impact of noise on health and quality of life, neighbouring properties and the surrounding area;
- If it is likely to generate significant levels of noise it incorporates appropriate noise attenuation measures; Noise sensitive development, such as residential, will not be permitted in close proximity to existing or proposed development generating high levels of noise unless adequate sound insulation measures, as supported by a noise assessment are incorporated within the development. In appropriate circumstances, the applicant will be required to provide:
 - an assessment of the impact of noise generated by a proposed development; or
 - an assessment of the effect of noise by an existing noise source upon a proposed development

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Light pollution:

- The impact on local amenity, intrinsically dark landscapes and nature conservation areas of artificial lighting proposals (including floodlighting) is minimised, in terms of intensity and number of fittings;
- The applicant can demonstrate good design including fittings to restrict emissions from proposed lighting schemes;

Air Pollution:

- It does not cause unacceptable levels of air pollution;
- Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognised and acceptable levels;
- Development proposals (where appropriate) are consistent with Air Quality Management Plans. The degree of the impact of noise and light pollution from new development or change of use is likely to be greater in rural locations, especially where it is in or close to specially designated areas and sites.

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6. DEVELOPMENT APPROACH

This report adopts the following approach to provide compliance with the Local and National Planning Policies:

1. To propose to improve building fabric from minimum Part L (2021) Building Regulations requirements.
2. To propose to reduce energy consumption and carbon dioxide emissions through passive and energy efficiency measures.
3. Investigate the possibility of connection into existing District Heating / Cooling Networks
4. To propose to reduce energy consumption and carbon dioxide emissions further through the use of on-site renewable / LZC energy technologies.

Table 6.1 below outlines the Part L Building Regulations that the development shall be assessed under:

Building Element	Part L Building Regulations Applicable
Use Class Hotel	Part L2 2021
Use Class Retail	Part L2 2021
Use Class Residential	Part L1 2021

Table 6.1 Part L Building Regulations Applicable

7. ASSESSMENT OF BASELINE ENERGY

Government policies require significant energy reductions from buildings. Building a Greener Future sets a planned trajectory (delivered via Part L of the building regulations 2021) with an aspiration for all non-domestic new buildings to be zero carbon by 2020. The Climate Change Act (Nov 2008) sets the UK targets of; CO₂ reduction of 26% by 2020 and CO₂ reduction of 100% by 2050.

7.1. POLICY REVIEW

National Planning Policy Framework (2025)

Paragraph 165

To help increase the use and supply of renewable and low carbon energy and heat, plans should:

provide a positive strategy for energy from these sources, that maximises the potential for suitable development, and their future re-powering and life extension, while ensuring that adverse impacts are addressed appropriately (including cumulative landscape and visual impacts);

consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

Mid Sussex District Plan (2014-2031)

DP39: Sustainable Design and Construction

All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:

- Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation;
- Explore opportunities for efficient energy supply through the use of communal heating networks where viable and feasible;
- Use renewable sources of energy;
- Maximise efficient use of resources, including minimising waste and maximising recycling/ re-use of materials through both construction and occupation;
- Limit water use to 110 litres/person/day in accordance with Policy DP42: Water Infrastructure and the Water Environment;
- Demonstrate how the risks associated with future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer term resilience

7.2. DEVELOPMENT SUSTAINABILITY FEATURES

The primary energy demands of the development will be:

- Heating
- Lighting
- Hot water
- General Power
- Cooling
- Ventilation

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To assess the preliminary energy consumption of the proposed commercial part of the development, calculations have been completed using approved SBEM software (OpenBuildings) and residential part of the development have been assessed using Elmhurst SAP software. The calculations generate annualised energy consumption for the buildings, from which the “carbon footprint” can be assessed.

The total baseline energy and carbon emissions for the entire development, taking into account regulated energy demands are:

	<i>Baseline Tonnes CO₂/Annum</i>	<i>Baseline kWh/Annum</i>
Hotel & Retail development based on Part L1 2021	49.81	353,224.82
Residential development based on Part L2 2021	132.07	871,117.10

Table 7.1 Predicted Baseline Carbon and Energy Emissions

(A full set of calculations supporting these figures included in Appendix B of this document)

8. BE LEAN - ENERGY EFFICIENT MEASURES

The proposed development incorporates a range of passive and active design measures that will reduce the energy demand for space conditioning, hot water and lighting.

8.1. PASSIVE DESIGN MEASURES

Enhanced U-Values

The heat loss of different building fabric elements is dependent upon their U-value. A building with low U-values provides better levels of insulation and reduced heating demand during the cooler months.

The proposed development will incorporate high levels of insulation and high-performance glazing beyond Part L 2021 targets in order to reduce the demand for space heating and/or cooling.

The table 8.1 demonstrates the improved performance of the proposed building fabric beyond the Building Regulations requirements for non-domestic uses.

Building Element	Proposed U-Value (W/m ² K)
External Walls	0.18
Internal Partitions	0.26
Exposed Floors	0.18
Exposed Roof	0.16
Personnel Door	1.30
Glazing	1.2 (g= 0.36)
Air Permeability	5 m ³ /hr/m ² @ 50 Pa

Table 8.1 U – Values targeted in the non-residential areas of the development.

The table 8.2 demonstrates the improved performance of the proposed building fabric beyond the Building Regulations requirements for domestic uses.

Building Element	Proposed U-Value (W/m ² K)
External Walls	0.15
Sheltered Walls (Apartment to Unheated Corridor/areas)	0.15
Exposed Floors	0.12
Exposed Roof	0.12
Personnel Door	1.40
Glazing	1.2 (g= 0.36)
Air Permeability	3 m ³ /hr/m ² @ 50 Pa

Table 8.2 U – Values targeted in the residential areas of the development.

AIR PERMEABILITY IMPROVEMENT

Heat loss may also occur due to air infiltration. Although this cannot be eliminated altogether, good construction detailing, and the use of best practice construction techniques can minimise the amount of air infiltration.

The proposed development will aim to improve upon the Part L 2021 minimum standards for air permeability by targeting air permeability rates of 5 m³/hr/m² at 50Pa within the non-residential areas and 3 m³/hr/m² at 50Pa within the residential areas.

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Reducing The Need For Artificial Lighting

The development has been designed for good levels of daylight in all habitable spaces as a way of improving the health and wellbeing of its occupants.

All of the habitable areas will benefit from large areas of glazing to increase the amount of daylight within the internal spaces where possible and Warehouse storage spaces from the Rooflights. This is expected to reduce the need for artificial lighting whilst delivering pleasant, healthy spaces for occupants.

8.2. ACTIVE DESIGN MEASURES

HIGH EFFICACY LIGHTING

The development intends to incorporate low energy lighting fittings throughout the spaces. All light fittings will be specified as low energy lighting and will accommodate LED with lighting efficacy as shown below table 8.3.

Lighting	
Lighting Type	lumens per circuit watt
LED	Bedroom – 120 lm/w Office Area's – 120 lm/w WC – 110 lm/w Circulation Area's – 110 lm/W Apartments – 100 lm/W

Table 8.3 Lighting efficacy targeted in the development.

HEAT RECOVERY VENTILATION

The mechanical ventilation system will include heat recovery in order to achieve ventilation in the most energy-efficient way. The table 8.4 below shows the heat recovery efficiencies for this development.

Mechanical Ventilation Heating Recovery (Typical Unit Chosen)				
Area Type	Supply/Extract SFP (W/l/s)	Heat Recovery Efficiency (%)	Exhaust Flow Rate (l/s/m²)	Exhaust SFP (W/l/s)
Office/Restaurant	2.0	65	x	x
Bath	x	x	5	0.4
Apartments	0.41	93	x	x

Table 8.4 Mechanical ventilation heat recovery efficiency

Comfort Cooling

VRF system of high energy efficiency ratios is assumed for both heating and cooling in the non-domestic part development. Therefore, the impact of active cooling in terms of energy use and carbon emissions will be minimised.

Monitoring

In addition to the above design measures, the development will incorporate monitoring equipment and systems to enable occupiers to monitor and reduce their energy use. Smart meters will be installed to monitor the heat and electricity consumption of the development.

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8.3. AS-BUILT RESIDENTIAL CONSIDERATIONS

In order to ensure that the *as-designed* SAP assessments for the residential units within the Martlets Shopping Centre redevelopment are mirrored at the *as-built* stage, sufficient evidence must be collected throughout the construction process in accordance with OCDEA (On-Construction Domestic Energy Assessor) requirements. This is critical for the successful lodging of the final EPCs and verification of the scheme's energy performance.

In relation to **passive design measures**, the following documentation and evidence should be collated:

- **MVHR Commissioning Certificate** – Approved commissioning documentation issued by the installing engineer, confirming correct installation, balancing, and operation of the Mechanical Ventilation with Heat Recovery (MVHR) systems.
- **BFRC Certificates for Glazing** – British Fenestration Rating Council (BFRC) certificates confirming the specified window and glazing performance aligns with SAP inputs (e.g., U-values, solar factors).
- **Thermal Bridging Evidence** – Clear photographic records of key junctions during construction, particularly those referenced in **Appendix F** of the SAP methodology. These images should demonstrate that construction aligns with accredited thermal bridge details or custom Psi-value assessments, in line with industry best practice.

It is recommended that all relevant certificates and photographic evidence are gathered in real time, verified by the relevant subcontractors or consultants, and stored in a central compliance file for EPC submission. This proactive approach will support a smoother closeout process and minimise the risk of post-construction performance gaps.

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9. BE CLEAN – SUPPLY ENERGY EFFICIENTLY

Be Clean energy refers to energy that is generated off the main grid, which may include micro-renewables, heating and cooling. It can refer to energy from waste plants, combined heat and power, district heating and cooling, as well as geothermal, biomass or solar energy.

CONNECTION TO AN EXISTING HEAT NETWORK

It was investigated to establish if there were any existing decentralised energy networks near the proposed site using the Department of Energy and Climate Change CHP database. It has been concluded that there are no suitable existing nearby CHP systems or source of waste heat or power to which a connection may be possible. The CHP availability map can be seen below in figure 9.1.

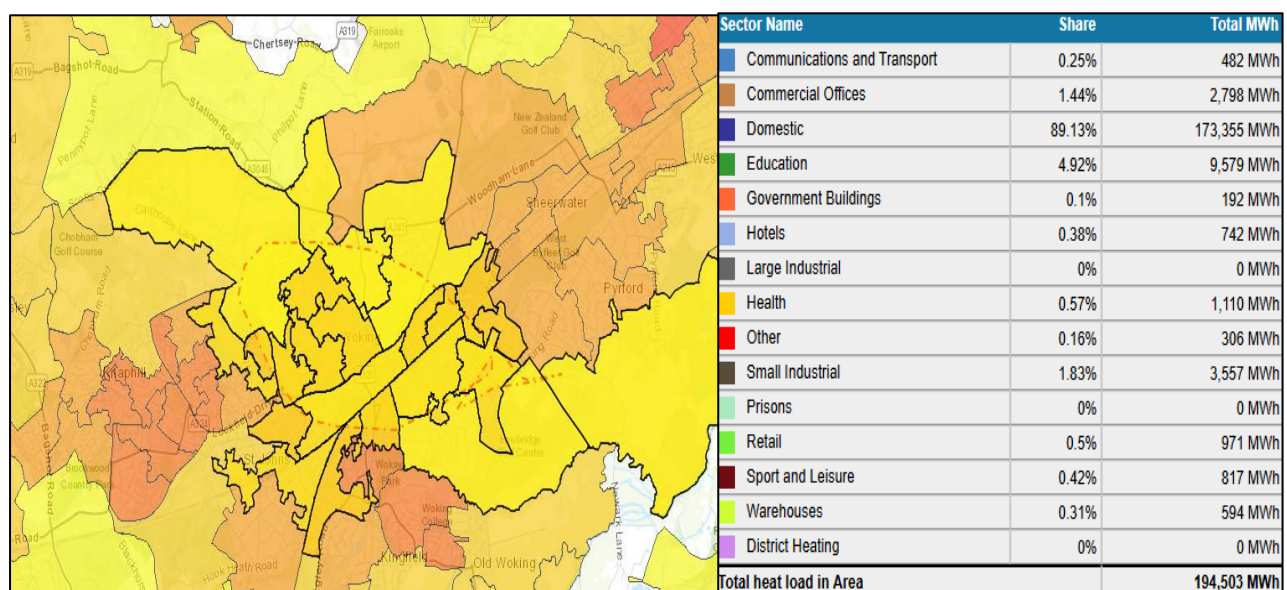


Figure 9.1 CHP availability Search Area

BE CLEAN CO2 EMISSIONS

Given that it has not been found feasible or viable for the proposed development to incorporate the supply of low carbon heating and cooling via connection to a District Energy Network, no carbon savings are achieved for this step of the Energy Hierarchy

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10. BE GREEN - RENEWABLE ENERGY

The use of renewable and low or zero carbon (LZC) technologies within the development has been addressed and the following, Table 10.1, reviews the primary options for generation of on-site renewable / LZC energy and considers their suitability for use on the development.

Renewable Technology Feasibility Assessment		Viable?
Bio Fuel Boilers 	Bio-fuel boilers are specifically designed to burn solid biomass or liquid bio-fuel in order to heat water, or raise steam. This can then be used for space heating or Domestic Hot Water (DHW) supply. Bio-fuel boilers could potentially provide the annual space heating and DHW demand for the Unit, however they are not recommended for this development for the following reasons:- 1. Biomass boilers generate increased Oxides of Nitrogen (NOx) and particulates (PM10) which would affect air quality. 2. The storage requirements for the biofuel would require a large plant space, with an auxiliary storage facility to allow for a two week period where delivery of fuel might not be available.	No
<u>Land Use</u> Large volumes of storage is required for fuel at ground level or basement level with sufficient vehicular access for fuel delivered. <u>Noise</u> Noise levels are generated by the operation of the bio-fuel boiler and associated deliveries of the bio-fuel. The plant room enclosure will have to be attenuated to acceptable levels imposed by planning and Acoustician recommendations.		

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Renewable Technology Feasibility Assessment		Viable?
Wind Turbines 	Wind turbines convert the kinetic energy in the wind into mechanical energy which is then converted into electricity. Wind turbines can provide electrical power either directly to a load or via a battery system. The use of wind turbines is not recommended for this development for the following reasons:- 1. Wind turbines, of a size necessary to make a contribution to the Unit renewable energy requirements are considered inappropriate on spatial, planning, aesthetic and noise grounds. Noise pollution from commercial wind turbines can be quite significant within a few hundred metres. 2. The site is not ideal; an ideal site is a hill with a flat, clear exposure. It should be free from strong turbulence and obstructions like large trees, houses or other buildings. As the development is in the town centre and is surrounded by similar buildings, turbulent wind flow will be experienced across the site which is not ideal for wind turbine installations. 3. The financial viability of a small scale installation on the site would be compromised by the operational efficiency of the unit (circa 30%). 4. Wind turbines, can cause electrical interference within a 2km radius. 5. Finally, the main disadvantage is down to the winds unreliability factor. The wind strength is often too low in many areas, where this site is located the wind speed is 4.9 m/s at 10m, as can be seen in the wind map presented in Appendix C, in order for the wind turbines to be feasible, wind speeds of greater than 5.5m/s are required.	No
<u>Land Use</u> There would be an adverse visual impact on the site which will be dependent on the height at which the wind turbines are located. <u>Noise</u> Noise levels are generated by the rotating blades; these noise levels will vary dependent on wind velocity and will need to be in acceptable levels imposed by planning and Acoustician recommendations.		
Ground Source Heat Pumps 	Space cooling and heating can be provided by circulating water cooled or heated directly by the ground or via subterranean water. Ground water cooling and heating through the use of aquifers makes use of the relatively stable ground/ water temperature which is available at a temperature range of 10 – 14°C. The use of Ground Source Heat Pumps is not recommended for this development for the following reasons:- 1. Cost of boreholes may be prohibitive (subject to site geological conditions). 2. Favourable ground conditions may not exist. 3. Problems can arise with boreholes silting up (open-loop).	No

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Renewable Technology Feasibility Assessment		Viable?
Water Source Heat Pump 	4. Changes in local ground conditions could affect water quality and the amount that can be extracted (open-loop).	No
	The development is not located in a groundwater source protection zone and as a result, is unlikely to require EA approval. However, use of water source heat pump would not be feasible for the following reasons: 1. A closed loop system would require an enquiry to be made to assess any potential effects on the water temperatures and consequently the wildlife. 2. Closed loop systems may contain thermal transfer fluids (which are toxic). If these are leaked, they could potentially pollute the canal.	
<u>Land Use</u> This installation would require Environmental Agency approval. Ground and Hydrology analysis would be required to investigate if favourable conditions exist. <u>Noise</u> There are no noise issues generated by this technology.		No
Solar Water Heating 	Solar Water Heating systems use radiant energy from the sun to heat water. Systems comprise of a roof mounted heat collector piped to a coil located within a hot water storage cylinder.	
	<u>Land Use</u> Roof space is better served for the installation of Photovoltaic panels. <u>Noise</u> Noise levels are generated by pumps at roof level, these are insignificant so should pose no issues.	
Air Source Heat Pumps 	An Air Source Heat Pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can extract heat from the air even when the outside temperature is as low as minus 15°C and typically draws approximately a quarter to a third of the electricity of a standard resistance heater for the same amount of heating, reducing utility bills. This typical efficiency compares to 70-95% for a fossil-fuel powered boiler.	Yes
	Air Source Heat Pumps (ASHP) are proposed for use within the hotel of the development to provide the low energy heating, cooling and domestic hot water whereas in residential apartments heating and DHW requirements. The benefits of ASHP are as follows: • They are proposed for the use within hotel Bedrooms, office, restaurant, kitchen and residential apartments of development to provide heating and water. The times when cooling is required may differ for different space depending on their use, occupancy period and levels, the operation of individual air source heat	

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Renewable Technology Feasibility Assessment		Viable?
	pumps would allow individual control and can be efficiently accommodated within the building design; • The heat pump unit can be configured to provide internal heat reclaim from dissimilar environmental zones, reducing energy consumption and carbon emissions.	
<u>Land Use</u> Air Source Heat Pumps can be installed on ground mounted, roof mounted or wall mounted frames. When installing Air Source Heat Pumps there are various factors to consider; Heat Pumps should be positioned to provide shelter from high winds which can reduce efficiency by causing defrost problems. <u>Noise</u> Noise levels are generated by fans, and compressors causing vibrations. The noise levels are dependent on manufacturer and vary accordingly, these will need to be in acceptable levels imposed by planning and Acousticians recommendations.		
Photovoltaics 	Photovoltaic (PV) modules convert sunlight directly to DC electricity. The solar cells consist of a thin piece of semiconductor material, in most cases silicon. The Photovoltaic panels are not proposed for the development as the required carbon targets have been achieved using heat pumps.	No
<u>Land Use</u> There are no land issues or adverse visual impacts as the photovoltaic panels are roof mounted. <u>Noise</u> There are no noise issues generated by this technology.		

Table 10.1 Renewable Energy Options

10.1. BE GREEN RESULTS

Following the inclusion of the VRF system, the total energy consumption and carbon emissions for the Proposed Development, taking into account regulated energy demands have further reduced to:

	<i>Be Green</i> <i>Tonnes CO₂/Annum</i>	<i>Be Green</i> <i>kWh/Annum</i>
Hotel & Retail development based on Part L1 2021	48.63	344,475.65
Residential development based on Part L2 2021	51.18	237,651.83

Table 10.2 Predicted Be Green Carbon and Energy Emissions

The figures below 10.1 and 10.2 shows the energy and carbon savings for the development.

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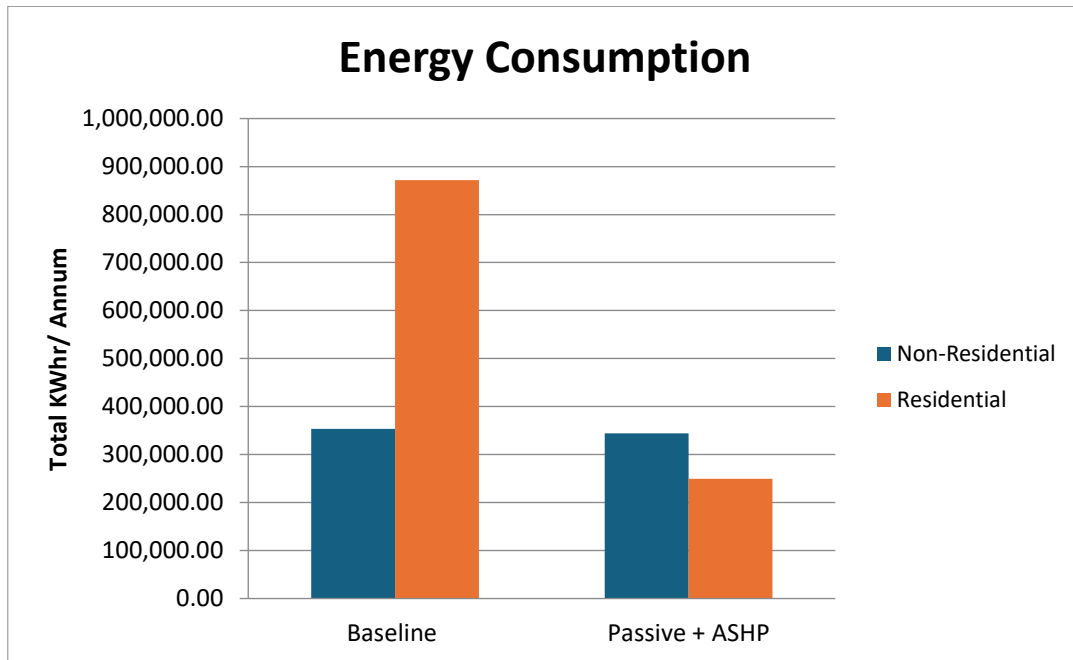


Figure 10.1 Annual Energy Consumption for the development

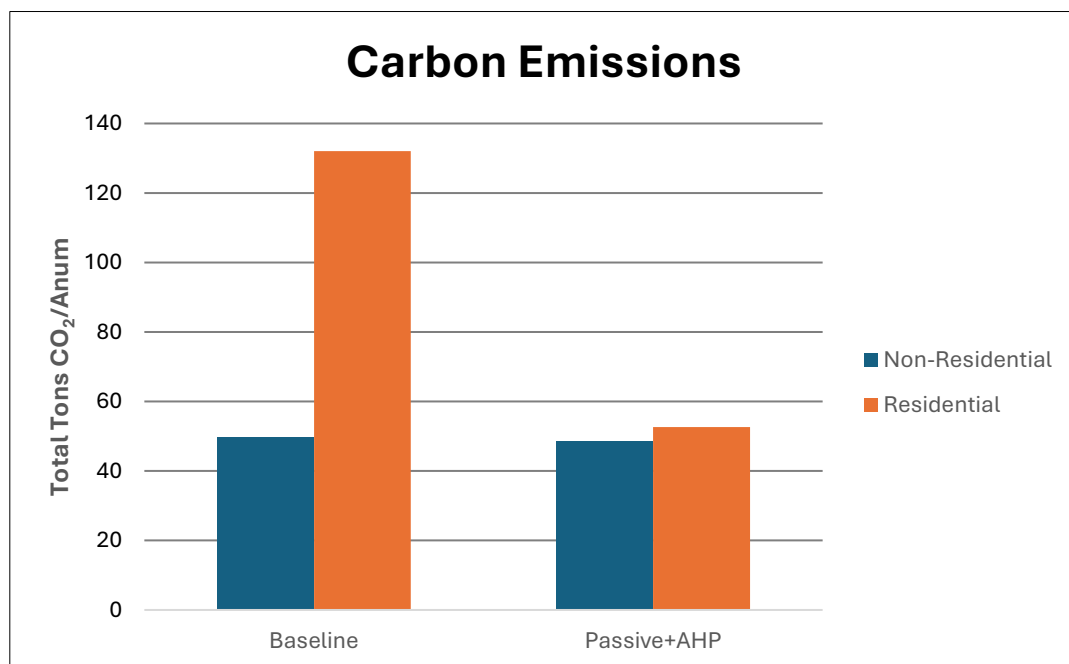


Figure 10.2 Annual Carbon Emissions for the development

The development shall have an anticipated CO₂ improvement of 45.13% beyond Part L 2021.

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11. WATER CONSUMPTION

The ever-increasing impacts of climate change are continuously inflating demand for water, as well as increasing a need for awareness towards water usage. The UK is already under a large amount of pressure regarding water resources. To contribute towards mitigating this issue, the proposed development will consider various means of being economical with water consumption.

11.1. POLICY REVIEW

Mid Sussex District Plan (2014-2031)

DP39: Sustainable Design and Construction

All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:

- Limit water use to 110 litres/person/day in accordance with Policy DP42: Water Infrastructure and the Water Environment;

11.2. DEVELOPMENT SUSTAINABILITY FEATURES

In order to ensure the reduction and management of water consumption within the proposed development, it is anticipated that various measures shall be undertaken, and specific features installed during the fit out works to minimise the building's potable water consumption.

It is anticipated that improvements in the consumption of potable water will be achieved through the specification of water efficient components within sanitary areas during the fit out works. Such features include the specification of low flow taps as well as dual flush toilets with reduced flush volumes.

11.3. SUMMARY

To ensure the sustainability of the development it is anticipated that water efficient fixtures will be incorporated into the design, such as low flow taps and dual flush toilets with reduced effective flush volumes.

To be further sustainable, it is anticipated that pulsed water meters will be installed on the mains water supply, to effectively monitor water consumption. The inclusion of the above sustainability features allows for the development to be deemed sustainable with regard to water consumption.

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12. TRANSPORT

Transport produces a large proportion of the country's greenhouse gas emissions, something which government at both national and local level are striving to combat, especially through planning frameworks for new developments. Solutions to transport issues are to be incorporated into the design of the development.

12.1. POLICY REVIEW

National Planning Policy Framework (2025)

Section 9 - Promoting Sustainable Transport

Paragraph 109

Transport issues should be considered from the earliest stages of plan-making and development proposals, using a vision-led approach to identify transport solutions that deliver well-designed, sustainable and popular places. This should involve:

- a) making transport considerations an important part of early engagement with local communities;
- b) ensuring patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places;
- c) understanding and addressing the potential impacts of development on transport networks;
- d) realising opportunities from existing or proposed transport infrastructure, and changing transport technology and usage – for example in relation to the scale, location or density of development that can be accommodated;
- e) identifying and pursuing opportunities to promote walking, cycling and public transport use; and
- f) identifying, assessing and taking into account the environmental impacts of traffic and transport infrastructure – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains.

Mid Sussex District Plan (2014-2031)

DP21: Transport

Development will be required to support the objectives of the West Sussex Transport Plan 2011- 2026, which are:

- A high quality transport network that promotes a competitive and prosperous economy; A resilient transport network that complements the built and natural environment whilst reducing carbon emissions over time; Access to services, employment and housing; and
- A transport network that feels, and is, safer and healthier to use. To meet these objectives, decisions on development proposals will take account of whether:
 - The scheme is sustainably located to minimise the need for travel noting there might be circumstances where development needs to be located in the countryside, such as rural economic uses (see policy DP14: Sustainable Rural Development and the Rural Economy);
 - Appropriate opportunities to facilitate and promote the increased use of alternative means of transport to the private car, such as the provision of, and access to, safe and convenient routes for walking, cycling and public transport, including suitable facilities for secure and safe cycle parking, have been fully explored and taken up The scheme is designed to adoptable standards, or other standards as agreed by the Local Planning .Where practical and viable, developments should be located and designed to incorporate facilities for charging plug-in and other ultra-low emission vehicles

12.2. DEVELOPMENT SUSTAINABILITY FEATURES

The Proposed Development is located approximately 55 miles from Central London. The site location is within a 8-minute walk from Burgess Hill Train Station which can be used to commute to and from work (Figure 12.1).

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In order to encourage sustainable means of transport rather than commuting in private vehicles it is anticipated there will be the provision of cycle storage facilities within the site.

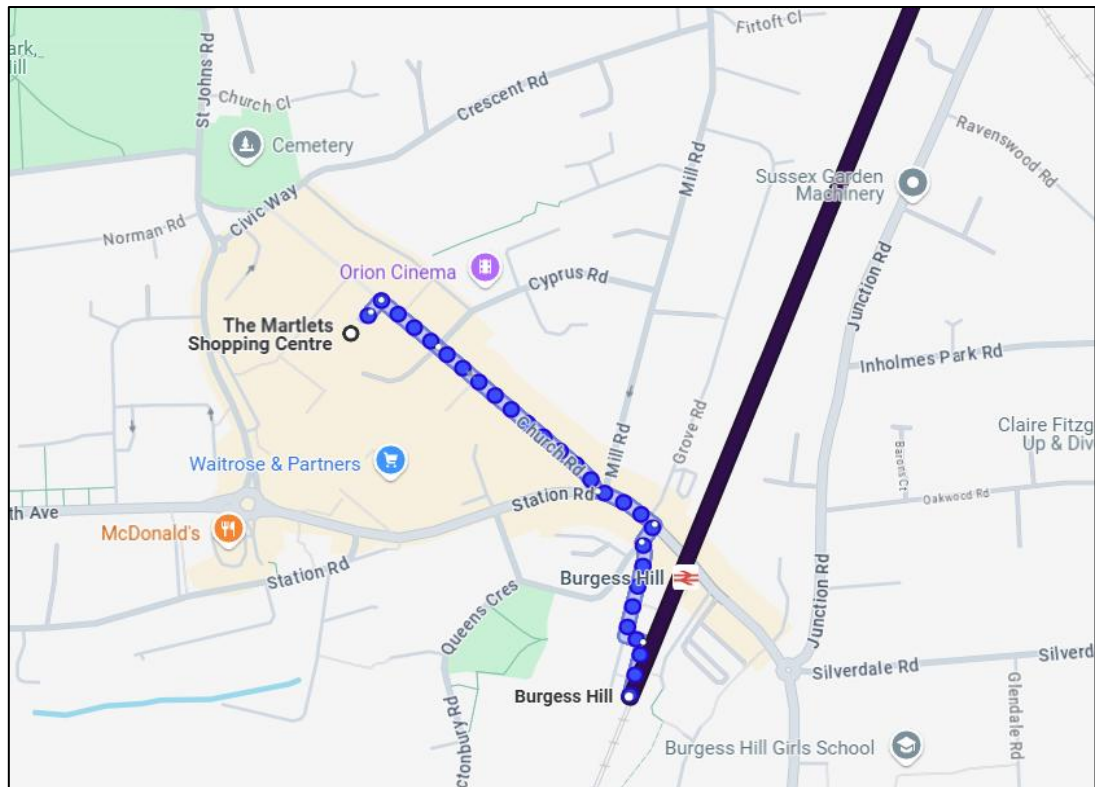


Figure 12.1 Nearest Public Transport

The development at Martlets Shopping Centre, prioritizes sustainability and accessibility through well-designed parking and transport facilities. Key features include:

Parking & Accessibility: Dedicated parking spaces available for visitors and guests.

Public Transport: Convenient access to Burgess Hill Station, less than a 10-minute walk away.

Cycling Infrastructure: Anticipated cycle storage to encourage sustainable travel.

12.3. SUMMARY

The above provisions aim to make the proposed development easier to access for all building users, as well as offering a sustainable means of commuting rather than using a private vehicle.

13. CONSTRUCTION SITE MANAGEMENT

The requirement for new materials needs to be minimised, by re-using existing buildings and materials where possible and providing a Site Waste Management Plan for all construction sites. This responsibility lies with the contractor and needs to be clarified at an early design stage. It is becoming a greater requirement now to construct buildings that are flexible and can be re-used.

13.1. POLICY REVIEW

National Planning Policy Framework (2025)

Paragraph 20

Strategic policies should set out an overall strategy for the pattern, scale and design quality of places and make sufficient provision for:

b) infrastructure for transport, telecommunications, security, waste management, water supply, wastewater, flood risk and coastal change management, and the provision of minerals and energy (including heat)

Mid Sussex District Plan (2014-2031)

DP39: Sustainable Design and Construction

All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:

- Maximise efficient use of resources, including minimising waste and maximising recycling/ re-use of materials through both construction and occupation;

13.2. DEVELOPMENT SUSTAINABILITY FEATURES

In order to comply with national and local policy, it is anticipated that certain measures will be put into place for this development, such as Outline Demolition Management Plan will be provided.

It is expected that the main contractor will also set targets and monitor site consumption data for water consumption, energy consumption as well as fuel from deliveries and collection of waste and materials to and from site. Monitoring of such actions can encourage contractors to become more resource efficient to meet given targets.

Additionally, it is expected the main contractor will comply with best standards as set out in the Considerate Constructors Scheme, achieving a score which is considered as exceeding compliance with the criteria of the scheme.

To ensure the sustainable construction of the development, the project will consider the concept of the waste hierarchy as seen in Figure 13.1 below. The waste hierarchy recognises the need for waste to be considered for a variety of waste streams before being sent to land fill as a last resort. The hierarchy is as follows:

- *Waste minimisation;*
- *Reusing or waste or up cycling;*
- *Recycling of all applicable materials;*
- *Recovery of energy from waste (anaerobic digestion plants);*
- *Waste is sent to landfill.*

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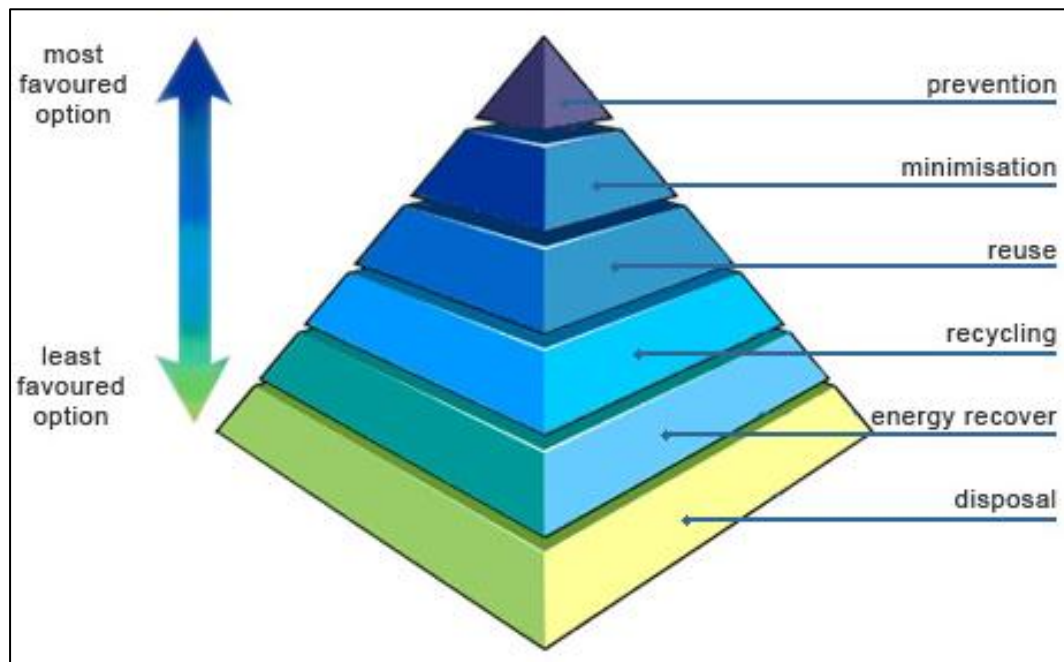


Figure 13.1 Waste Hierarchy Diagram

13.3. SUMMARY

The Proposed Development will produce an Outline Demolition Management Plan and also adhere to a Considerate Constructors Scheme, achieving a targeted score which exceeds 'compliance' with the criteria of the scheme. As a result of these measures, the development may be deemed sustainable as regards to construction site management.

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14. SUSTAINABLE DESIGN

Good urban design is essential in providing a varied and sustainable environment, which can facilitate opportunities for positive contributions within communities. As part of sustainable design for developments, it is essential that suitable design principles are followed to maximise opportunities for energy reduction through design as well as ensuring buildings follow or enhance the character of an area.

14.1. POLICY REVIEW

National Planning Policy Framework (2025)

Section 12- Achieving Well-Designed Places

Paragraph 131

The creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. Being clear about design expectations, and how these will be tested, is essential for achieving this. So too is effective engagement between applicants, communities, local planning authorities and other interests throughout the process.

Mid Sussex District Plan (2014-2031)

DP39: Sustainable Design and Construction

All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:

- Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation;
- Explore opportunities for efficient energy supply through the use of communal heating networks where viable and feasible;
- Use renewable sources of energy;
- Maximise efficient use of resources, including minimising waste and maximising recycling/ re-use of materials through both construction and occupation;
- Limit water use to 110 litres/person/day in accordance with Policy DP42: Water Infrastructure and the Water Environment;
- Demonstrate how the risks associated with future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer term resilience

14.2. DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development shall include a variety of features which are regarded as having a good sustainable design. It is anticipated that any external lighting specified will be designed to reduce unnecessary light pollution during nighttime hours, a lighting assessment has been undertaken to ensure this.

To ensure the risk of potential overheating is minimised building modelling of the unit has confirmed that no occupied space is at risk from excessive solar gains; this being achieved through use of glazing with a low shading coefficient. Additionally, to ensure that overheating will not occur during summer months and the building is suitably insulated as well as allowing for adaptation due to the effects of climate change, it is anticipated that the development will use building fabrics with enhanced 'U' values which go beyond the minimum requirements of Part L (2021), as seen within Table 14.1. Further to this the energy efficiency measures discussed within Section 8.0 will be incorporated into the design of the development. It is anticipated that such measures will lower the building's energy requirements making its operation feasible and practical for years to come.

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Travelodge Hotel and Commercial Unit			
Element	Part L Requirement	U Value Specified	% Improvement
Wall	0.26	0.18	30.76%
Roof	0.18	0.16	11.11%
Floor	0.18	0.18	N/A
Glazing	1.6	1.2	25%
Residential Block			
Wall	0.26	0.15	42.31%
Roof	0.16	0.12	25.00%
Floor	0.18	0.12	33.33%
Glazing	1.6	1.2	25.00%

Table 14.1 U Value Improvements

To provide a fully sustainable development it is also anticipated that the materials used for the following main elements of the development shall be rated under the Green Guide to Specification targeting ratings between A+ and D:

- External walls;
- Ground floor;
- Roof;
- Windows.

To provide a development which remains sustainable during its operation phase, it is anticipated that space will be provided for the provision of waste storage facilities with additional space of recyclable waste streams. This is to enable building users to sort waste before collection and minimise the quantity of waste that may end up at landfill.

The development incorporates thoughtful landscaping improvements to enhance biodiversity and the overall environmental quality of the site. These include mixed planting and grassland areas strategically located in the northern and eastern parts of the site, contributing to a greener, more sustainable environment. Additionally, a biodiverse green roof is integrated into the cycle shelters, further promoting ecological benefits and aligning the development with modern sustainability standards.

14.3. SUMMARY

In order to comply with national and local policies, the development shall strive to provide both to building users and the local community a building of sustainable design.

Measures should be taken to ensure the thermal comfort of future building users, through efforts such as ensuring no occupied areas will result in excessive solar gains and in turn over heating.

External lighting except safety and security lighting should be designed to be switched off automatically through the use of timers of day light sensors as well as the specification of cut off luminaires to reduce any potential light spill on to neighbouring properties as covered in the lighting assessment.

The above design features allow for the proposed development to be of sustainable design.

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15. FLOOD RISK

To prevent an increase in surface water run off through development of a site, it is imperative that consideration is given to the reduction of over land flow during storm events as well as the impact of development in potential flood risk areas.

15.1. POLICY REVIEW

National Planning Policy Framework (2025)

Section 14- Meeting the Challenge of Climate Change, Flooding and Coastal Change

Paragraph 170

Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

Mid Sussex District Plan (2014-2031)

DP41: Flood Risk and Drainage

Proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increase the risk of flooding elsewhere. The District Council's Strategic Flood Risk Assessment (SFRA) should be used to identify areas at present and future flood risk from a range of sources including fluvial (rivers and streams), surface water (pluvial), groundwater, infrastructure and reservoirs. Particular attention will be paid to those areas of the District that have experienced flooding in the past and proposals for development should seek to reduce the risk of flooding by achieving a reduction from existing run-off rates.

Sustainable Drainage Systems (SuDS) should be implemented in all new developments of 10 dwellings or more, or equivalent non-residential or mixed development unless demonstrated to be inappropriate, to avoid any increase in flood risk and protect surface and ground water quality. Arrangements for the long term maintenance and management of SuDS should also be identified.

For the redevelopment of brownfield sites, any surface water draining to the foul sewer must be disconnected and managed through SuDS following the remediation of any previously contaminated land.

SuDS should be sensitively designed and located to promote improved biodiversity, an enhanced landscape and good quality spaces that improve public amenities in the area, where possible.

The preferred hierarchy of managing surface water drainage from any development is:

1. Infiltration Measures
2. Attenuation and discharge to watercourses; and if these cannot be met,
3. Discharge to surface water only sewers.

Land that is considered to be required for current and future flood management will be safeguarded from development and proposals will have regard to relevant flood risk plans and strategies.

15.2. DEVELOPMENT SUSTAINABILITY FEATURES

The flood map sourced from The Government Flood Warning Information Service seen below in Figure 15.1 and 15.2, demonstrates that the proposed site is located within Flood Zone 1 and as such is not at risk of flooding from rivers, sea and surface water sources.

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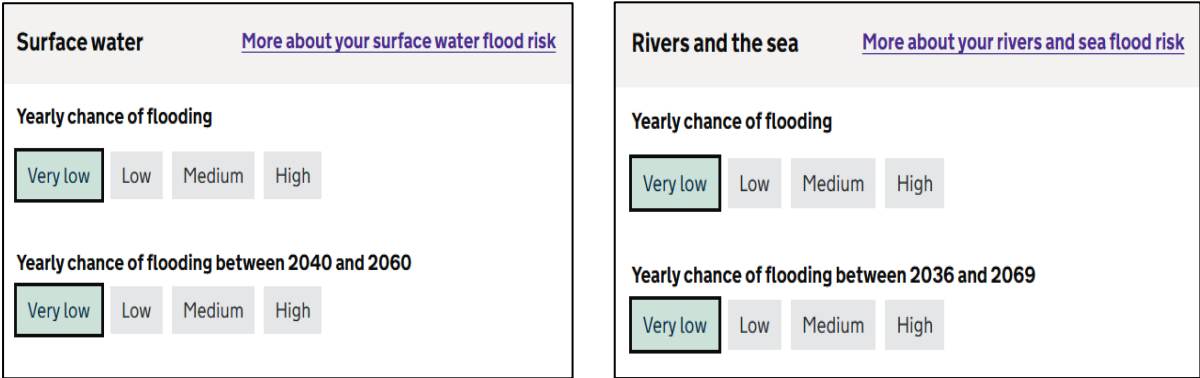


Figure 15.1: Flood Risk Summary (Sourced from the Government Flood Warning Information Service)

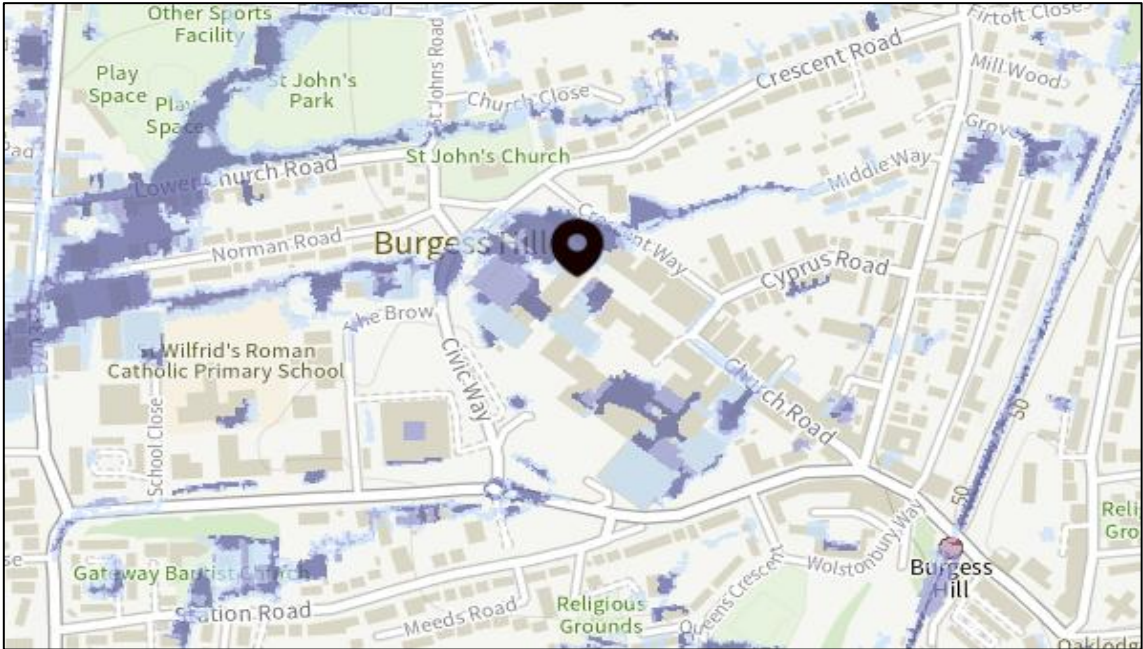


Figure 15.2: Surface Water Map (Sourced from the Government Flood Warning Information Service)

15.3. SUMMARY

The development is situated in Flood Zone 1, indicating a low risk of flooding. As a result, flood-related impacts are not anticipated to be a concern. The site will be designed with resilient drainage strategies to effectively manage surface water runoff, ensuring there is no increased flood risk to surrounding areas. This approach supports both sustainability and compliance with best practice flood management requirements.

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16. NOISE

Noise is a subjective concept that can affect people differently, however there are set standards as to acceptable levels of noise, for different areas and times of day. In this instance, the proposed development would be subject to potential noise pollution from road sources.

16.1. POLICY REVIEW

National Planning Policy Framework (2025)

Section 15- Conserving and Enhancing the Natural Environment

Paragraph 187

Planning policies and decisions should contribute to and enhance the natural and local environment by:

- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Mid Sussex District Plan (2014-2031)

DP29: Noise, Air and Light Pollution

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Noise pollution:

- It is designed, located and controlled to minimise the impact of noise on health and quality of life, neighbouring properties and the surrounding area;
- If it is likely to generate significant levels of noise it incorporates appropriate noise attenuation measures;

Noise sensitive development, such as residential, will not be permitted in close proximity to existing or proposed development generating high levels of noise unless adequate sound insulation measures, as supported by a noise assessment are incorporated within the development. In appropriate circumstances, the applicant will be required to provide:

- an assessment of the impact of noise generated by a proposed development; or
- an assessment of the effect of noise by an existing noise source upon a proposed development

16.2. DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development is not subject to extreme noise pollution from road and rail sources, as can be seen in figure 16.1 and 16.2 It should be noted that the noise levels are 'A' weighted and as such only demonstrate sounds on a frequency that would affect human populations, it does not consider noise on frequencies that may affect any local habitats.

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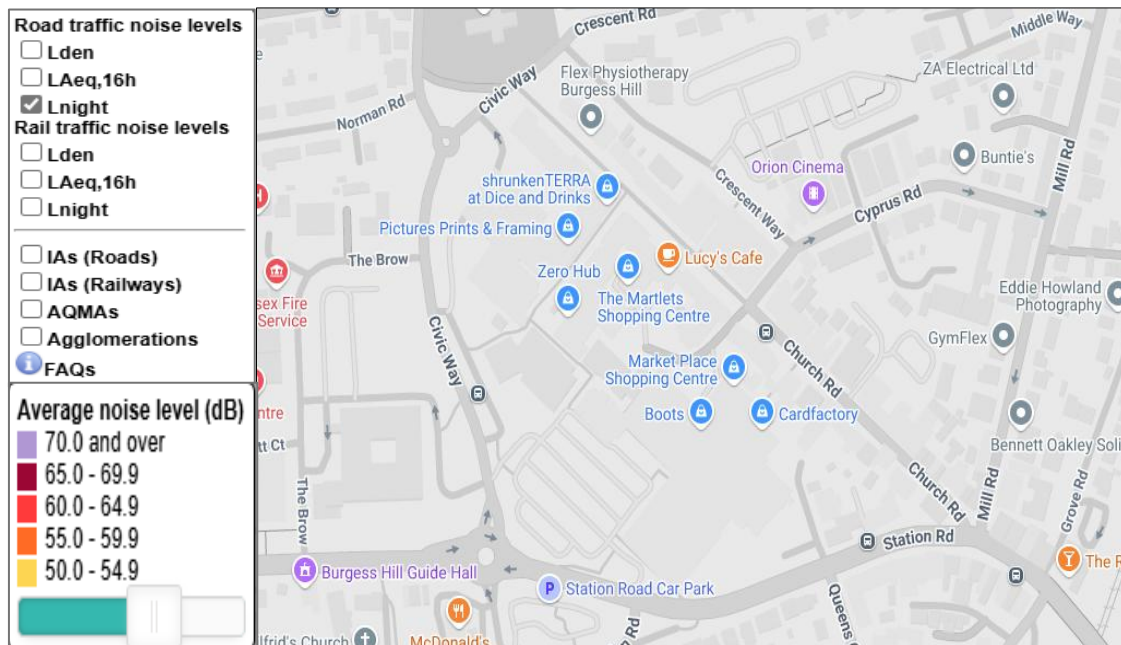


Figure 16.1: Road Noise Data Map (Postal Code Analysis, Sourced from Extrium)

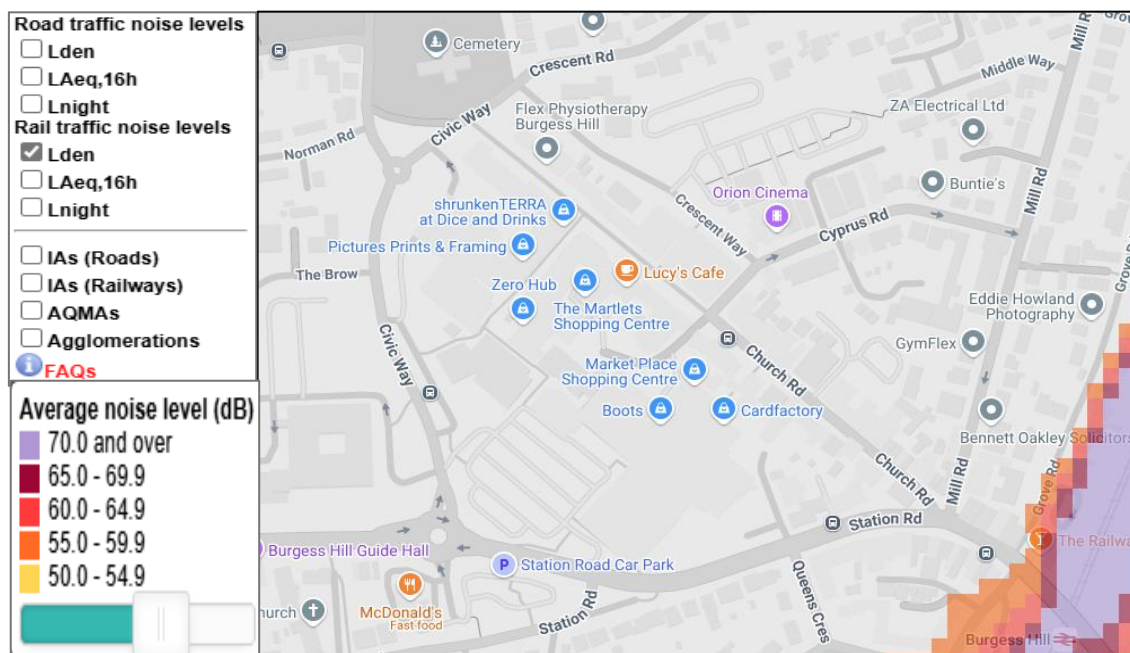


Figure 16.2 Rail Noise Data Map (Postal Code Analysis, Sourced from Extrium)

16.3. SUMMARY

The development would not be subject to sources of noise pollution from the surrounding roads or from rail sources.

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17. ECOLOGY

Ecology is essential within many communities, with the mix of flora and fauna facilitating benefits such as flood alleviation and pollution amelioration. In addition to this, areas with a wealth of green spaces and an abundance of biodiversity are seen to provide a positive contribution to a community.

17.1. POLICY REVIEW

National Planning Policy Framework (2025)

Section 15- Conserving and Enhancing the Natural Environment

Paragraph 187

Planning policies and decisions should contribute to and enhance the natural and local environment by:

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)

Mid Sussex District Plan (2014-2031)

DP38: Biodiversity

Biodiversity will be protected and enhanced by ensuring development:

- Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure, so that there is a net gain in biodiversity, including through creating new designated sites and locally relevant habitats, and incorporating biodiversity features within developments; and
- Protects existing biodiversity, so that there is no net loss of biodiversity. Appropriate measures should be taken to avoid and reduce disturbance to sensitive habitats and species. Unavoidable damage to biodiversity must be offset through ecological enhancements and mitigation measures (or compensation measures in exceptional circumstances); and
- Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience; and
- Promotes the restoration, management and expansion of priority habitats in the District; and
- Avoids damage to, protects and enhances the special characteristics of internationally designated Special Protection Areas, Special Areas of Conservation; nationally designated Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty; and locally designated Sites of Nature Conservation Importance, Local Nature Reserves and Ancient Woodland or to other areas identified as being of nature conservation or geological interest, including wildlife corridors, aged or veteran trees, Biodiversity Opportunity Areas, and Nature Improvement Areas.

Designated sites will be given protection and appropriate weight according to their importance and the contribution they make to wider ecological networks.

Valued soils will be protected and enhanced, including the best and most versatile agricultural land, and development should not contribute to unacceptable levels of soil pollution.

Geodiversity will be protected by ensuring development prevents harm to geological conservation interests, and where possible, enhances such interests. Geological conservation interests include Regionally Important Geological and Geomorphological Sites.

17.2. DEVELOPMENT SUSTAINABILITY FEATURES

An ecology conservation map (sourced from MAGIC) is typically used to confirm the absence of a Site of Special Scientific Interest (SSSI) near the proposed development. An ecology conservation map (sourced from MAGIC) highlights there is no Site of Special Scientific Interest (SSSI) in the vicinity of the site development. Figure 17.1 below shows that the nearest SSSI (Ditchling Common) is approximately 2 km from the proposed development.

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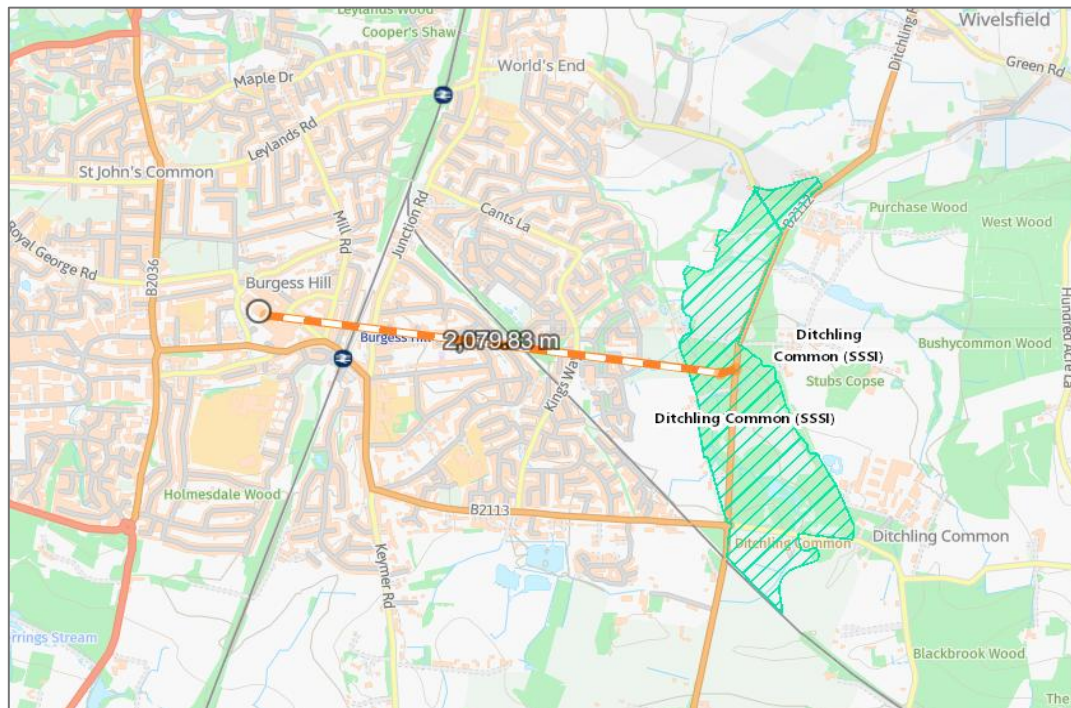


Figure 17.1 Ecological Sensitivity (Sourced from MAGIC)

17.3. SUMMARY

It is anticipated that the proposed development is located in an area with no direct impact on any Sites of Special Scientific Interest (SSSI), as the nearest SSSI is far enough to have an impact on the development.

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18. AIR QUALITY

Air quality is a concept that refers to the condition or cleanliness of the air in a specific environment, typically measured by the concentration of various pollutants and the presence of harmful substances.

18.1. POLICY REVIEW

Mid Sussex District Plan (2014-2031)

DP29: Noise, Air and Light Pollution

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Air Pollution:

- It does not cause unacceptable levels of air pollution;
- Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognised and acceptable levels;
- Development proposals (where appropriate) are consistent with Air Quality Management Plans.

18.2. DEVELOPMENT SUSTAINABILITY FEATURES

The air quality map seen in Figure 18.1 (sourced from the DEFRA) confirms that there are no breaches in air pollution within close proximity to the development location. The Environment Agency analysis reviews emission levels from the following pollutants:

- Carbon dioxide;
- Dioxins;
- Nitrogen oxides;
- Particulates (PM10);
- Sulphur oxides.

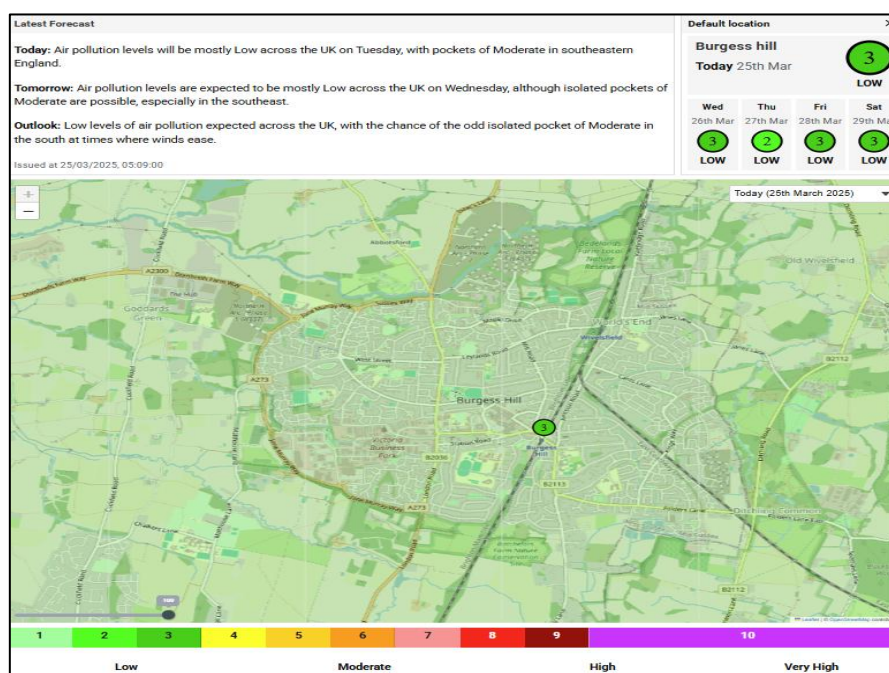


Figure 18.1 – Air Quality Map

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The map within Figure 18.1 shows that Burgess Hill is in an area with an acceptable quality of air. This scheme has maximised use of sustainable features to reduce any negative impact on the Air Quality.

18.3. SUMMARY

Once the development is completed and operational, it will have insignificant impact on the local air quality, hence no mitigation would be required. The site is therefore considered to be suitable for both residential and commercial use. Hence the proposed development can be deemed sustainable with regard to air quality.

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19. ENERGY MODELLER QUALIFICATIONS

The Energy Modelling (SBEM) was carried out by Hasnaat Mahmood and his qualifications and CV can be seen below in figure 19.1 and 19.2.

Mahmood,Hasnaat Shahid
(0.56) Miles

Cudd Bentley Consulting
Ashurst Manor, Church Lane
Sunninghill, Ascot
SL5 7DD
United Kingdom
Email: hasnaat.mahmood@cuddbentley.co.uk
Tel: 01344628821

LCC: LCC Building Design; LCC Simulation;

LCEA: LCEA EPC Level 3 and 4 EW&NI;

Figure 19.1 Energy Modeller Qualifications

HASNAAT MAHMOOD

TITLE: Senior Sustainability Engineer

QUALIFICATIONS: BEng Mechanical Engineering
MSc Renewable Energy Systems
Part L Level 3/4 Energy Assessor
Hevacomp Part L Competent

EXPERIENCE: Hasnaat joined Cudd Bentley in 2021 and is mainly involved in undertaking Energy and Sustainability assessments, Building Regulation compliance, SBEM/SAP modelling and ensuring local and national planning policy requirements are met for various projects. He has a MSc degree in Renewable Energy Systems from University of Surrey. He has experience in residential, industrial and mixed-use developments and since joining Cudd Bentley he has gained extensive experience within the sustainability sector and has been promoted from graduate to sustainability engineer.

Publications
Managing for Energy Performance – A Guiding Framework for Property Management

WOOLWICH PHASE 3 & PHASE 4
Part L compliance, Energy Statement, Sustainability Statement, Feasibility Study, Overheating Assessment

POYLE INDUSTRIAL DEVELOPMENT
Energy and Sustainability Statement, Feasibility Statement, BREEAM Assessment

Sainsbury's Ilford
The scheme consists of 7 multi-purpose blocks with over 1200 residential units with one block to serve student accommodation. Took the lead role in sustainability ensuring the best energy solution has been proposed in order to comply with the GLA planning policies. Worked on the Energy Statement, Sustainability Statement, Whole Life Cycle and GHG report.

West Midlands Interchange
The scheme consists of industrial warehouses (the largest in West Midlands) with office spaces on the ground and first floor. Worked on the net-zero report, in which a pathway was identified and proposed to make the building completely net zero in terms of operational energy and embodied carbon.

Thames Road
Produced an overheating assessment for the residential development in London and proposed mitigation measures in order to comply with CIBSE TM59 criteria.

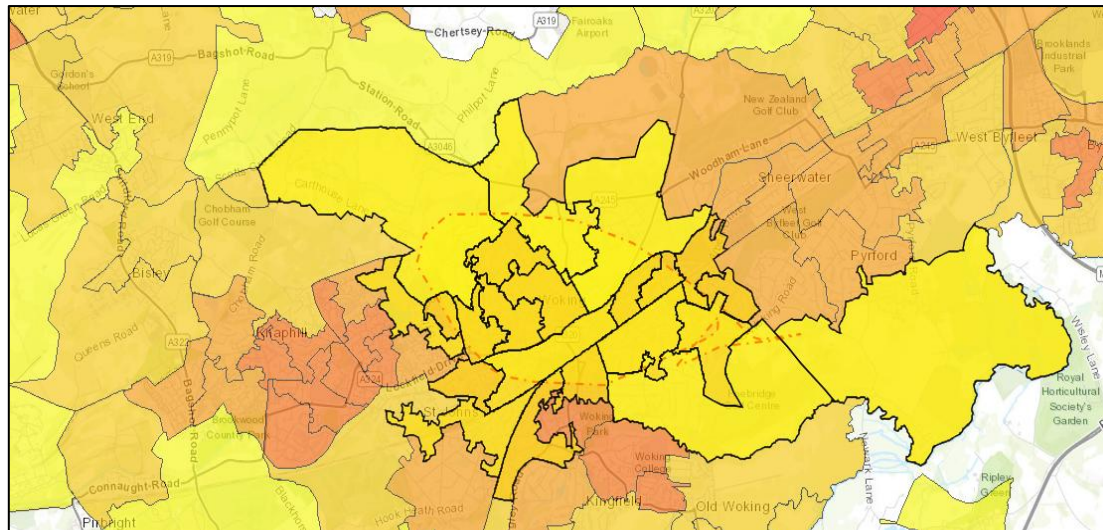
Laporte Way, Luton
Worked on the Energy and Sustainability Statement for this industrial development for planning. Also, produced a net-zero carbon report in which solutions were proposed to make the development a net-zero building.

Unit Q West, Heathrow
This project consists of re-development of an existing building by changing the internal layouts and some building fabric. Worked on the operational energy calculation to determine amount of PV required to make building net-zero for operational use and offset embodied carbon.

Figure 19.2 Energy Modeller CV

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APPENDIX A – CHP SEARCH



CHP availability Search Area

Sector Name	Share	Total MWh
Communications and Transport	0.25%	482 MWh
Commercial Offices	1.44%	2,798 MWh
Domestic	89.13%	173,355 MWh
Education	4.92%	9,579 MWh
Government Buildings	0.1%	192 MWh
Hotels	0.38%	742 MWh
Large Industrial	0%	0 MWh
Health	0.57%	1,110 MWh
Other	0.16%	306 MWh
Small Industrial	1.83%	3,557 MWh
Prisons	0%	0 MWh
Retail	0.5%	971 MWh
Sport and Leisure	0.42%	817 MWh
Warehouses	0.31%	594 MWh
District Heating	0%	0 MWh
Total heat load in Area		194,503 MWh

Total Heat Load Distribution

APPENDIX B – WIND MAP

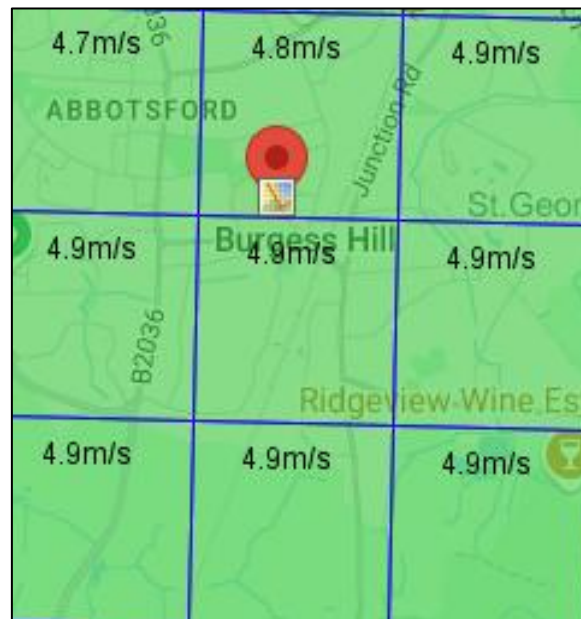


Chart C.1 Wind Velocity Chart for the Development Site

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APPENDIX C – ENERGY AND CARBON CALCULATIONS

Commercial + Hotel

Baseline Energy

kWh/m²/annum Baseline											
Typical Unit	Area	Heating	Cooling	Auxiliary	Lighting	Hotwater	Total	kWh/Annum	kgCO2/m²/Annum	Total kgCO2/Annum	Total TonsCO2/Annum
Travelodge Hotel	3228.30m²	25.24	6.48	4.02	12.18	38.63	86.55	279409.4	12.26	39578.96	39.58
Aldi Commercial	2006.40m²	5.31	7.46	5.12	17.20	1.70	36.79	73815.5	5.1	10232.64	10.23
Total	5234.70							353,224.82			49.81

Be Green Energy

kWh/m ² /annum Baseline + Passive + ASHP											
Typical Unit	Area	Heating	Cooling	Auxillary	Lighting	Hotwater	Total	kWh/Annum	kgCO ₂ /m ² /Annum	Total kgCO ₂ /Annum	Total TonsCO ₂ /Annum
Travelodge Hotel	3228.30m ²	25.27	6.38	4.02	11.82	36.99	84.48	272726.78	11.98	38675.034	38.68
Aldi Commercial	2006.40m ²	5.35	7.12	4.95	16.64	1.70	35.76	71,748.86	4.96	9951.744	9.95
Total	5234.70							344,475.65			48.63

Carbon Savings

Carbon Calculations (Regulated Energy Demands) Carbon								
Typical Unit	Total Area	Carbon Baseline kgCO ₂ /annum	Improved Emissions after Passive/Energy Efficiency (kgCO ₂ /annum)	Improved Emissions after CHP (kgCO ₂ /annum)	Improved Emissions after Passive + PV (kgCO ₂ /annum)	Total kgCO ₂ /annum displaced	Total TonsCO ₂ /annum displaced	Total % TonsCO ₂ /annum displaced
Travelodge Hotel	3228.30m ²	39578.958	38675.034	/	38675.03	903.92	0.90	2.28%
Aldi Commercial	2006.40m ²	10232.64	9951.744	/	9951.74	280.90	0.28	2.75%
Total	5,235	49,812	48,627	0	48,627	1,185	1.18	2.38%

Energy Savings

Energy Calculations (Regulated Energy Demands) Energy							
Typical Unit	Total Area	Energy Baseline (kWh/annum)	Total Energy with Passive/Energy Efficiency Measures (kWh/annum)	Total Energy after CHP (kWh/annum)	Total Energy with Passive + PV measures (kWh/annum)	Total Displaced Energy from Baseline (kWh/annum)	Total % kWh/annum displaced
Travelodge Hotel	3228.30m ²	279409.365	272726.78	/	272726.78	6682.58	2.4%
Aldi Commercial	2006.40m ²	73815.46	71748.86	/	71748.86	2066.59	2.8%
Total	5,235	353,225	344,476	0	344,476	8,749.17	2.48%

Residential Apartments

Baseline Energy

kWh/annum Baseline													
Typical Unit	Area m ²	Quantity	Total Area m ²	DEB	IEB	Heating	Cooling	Auxiliary	Lighting	Hot Water	Total kWh/Annum	Carbon kg Co2 / Annum	Tonnes
					TER Worksheet	DER Sheet (Row 307 a) + (Row 367 a x 0.01)	DER Sheet Row 321	DER Sheet (Row 313 + 331)	DER Sheet Row 332	DER Sheet (Row 310 a) + (Row 367 a x			
A-003 (GF) - 1B, 1P	44.14	7	308.98	18.71	18.71	4094.224467	0	212.5219	107.9942	1029.238067	38107.85043	5781.0158	5.78
A-002 (GF) - 2B, 3P	65.27	7	456.89	16.00	16.00	5267.760467	0	230.6655	186.7485	1131.426667	48136.20793	7310.24	7.31
A-009 (GF) - 2B, 3P	67.85	1	67.85	16.75	16.75	5827.1675	0	312.6901	198.2549	1146.562267	7484.664767	1136.4875	1.14
A-011 (GF) - 1B-2P	51.84	1	51.84	18.56	18.56	4899.824067	0	252.3368	140.9477	1044.873433	6337.382	962.1504	0.96
A-018 (FF) - 2B-4P	73.04	6	438.24	12.81	12.81	4524.777	0	263.6144	202.7955	1174.858633	36396.2744	5613.8544	5.61
A-023 (FF) - 1B, 1P	44.14	66	2913.24	15.17	15.17	3145.6127	0	171.6443	107.5282	994.0471667	231642.3362	44193.8508	44.19
A-022 (FF) - 2B, 3P	65.26	44	2871.44	12.53	12.53	3643.058233	0	229.7224	184.396	1131.366733	237386.3081	35979.1432	35.98
A-033 (FF) - 2B, 3P	67.64	8	541.12	12.96	12.96	4197.0533	0	244.3289	195.6325	1145.3553	46258.96	7012.9152	7.01
A-035 (FF) - 1B-2P	51.83	18	332.94	14.52	14.52	3583.727833	0	198.2506	138.3817	1044.806533	89373	13546.2888	13.55
A-159 (BF) - 1B, 1P	45.24	9	407.16	15.09	15.09	3216.18967	0	174.271	107.9232	1001.147633	40495.2012	6144.0444	6.14
A-160 (BF) - 1B-2P	57.01	1	57.01	13.89	13.89	3782.289367	0	211.4938	144.4054	1079.2509	5217.439467	791.8689	0.79
A-171 (1F) - 1B, 1P	45.24	3	135.72	18.98	18.98	4335.807433	0	207.8616	107.9232	1001.1473	16958.2366	2575.3656	2.58
A-172 (1F) - 1B-2P	57.01	1	57.01	17.92	17.92	5243.061433	0	255.3169	144.4054	1079.2509	6722.034633	1021.6192	1.02
Total	735.51	172	9239.44								871,117.10	132,069.44	132.07

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KWh/annum Baseline + Passive/Energy Efficiency Measures + ASHP													
Typical Unit	Area m ²	Quantity	Total Area m ²	DER	IER	Heating	Cooling	Auxiliary	Lighting	Hot Water	Total Kwh/Annunum	Carbon kg Co2 / Annunum	Tonnes
					TER Worksheet	DER Sheet [(Row 307a) + (Row 367a x 0.01)]	DER Sheet Row 321	DER Sheet (Row 313 + 331)	DER Sheet Row 332	DER Sheet [(Row 310a) + (Row 367a x			
A-003 (GF) - 1B-1P	44.14	7	308.98	4.4	18.71	134.3387	0	53.7254	107.9342	934.0478667	9310.738267	4400	4.4
A-002 (GF) - 2B-3P	65.27	7	456.89	3.66	16	177.65	0	137.9622	186.7485	1131.426667	11436.51157	3660	3.66
A-009 (GF) - 2B-3P	67.85	1	67.85	3.72	16.75	232.2491667	0	144.8429	198.2549	1146.562267	1721.909233	3720	3.72
A-011 (GF) - 1B-2P	51.84	1	51.84	4.13	18.56	168.9451667	0	110.4105	140.9477	1044.873433	1465.1768	4130	4.13
A-018 (FF) - 2B-4P	73.04	6	438.24	3.3	12.81	143.3833667	0	132.1726	202.7955	1174.858833	9919.2654	3300	3.3
A-023 (FF) - 1B-1P	44.14	66	2913.24	4.06	15.17	53.7077	0	78.8871	107.5282	934.0478667	81455.231	4060	4.06
A-022 (FF) - 2B-3P	65.26	44	2871.44	3.35	12.53	72.69966667	0	116.4317	184.996	1131.366733	66241.7404	3350	3.35
A-033 (FF) - 2B-3P	67.64	8	541.12	3.4	12.96	114.7768	0	121.8606	195.6325	1145.3553	12621.0016	3400	3.4
A-035 (FF) - 1B-2P	51.83	18	932.94	3.79	14.52	75.2552	0	92.9965	138.3817	1044.806533	24325.9188	3790	3.79
A-159 (8F) - 1B-1P	45.24	9	407.16	4.1	15.09	65.88133333	0	80.3639	107.9292	1001.147633	11477.904	4100	4.1
A-160 (8F) - 1B-2P	57.01	1	57.01	3.88	13.89	137.5283	0	102.1509	144.4054	1079.2509	1463.3355	3750	3.75
A-171 (11F) - 1B-1P	45.24	3	135.72	5.01	18.98	295.6190667	0	86.662	107.9232	1001.147633	4474.6737	5010	5.01
A-172 (11F) - 1B-2P	57.01	1	57.01	4.51	17.92	404.5393667	0	110.1631	144.4054	1079.2509	1738.419367	4510	4.51
Total	735.51	172	9239.44								237,651.83	51,180.00	51.18

Carbon Savings

Carbon Savings										
Typical Unit	Total Area	Quantity	Total Area	BaselineTotal kWh/annum	Baseline kgCO ₂ /annum	Improved Emissions after Passive Energy Efficiency kgCO ₂ /annum	Improved Emissions after Passive Energy Efficiency & PVs kgCO ₂ /annum	Total kgCO ₂ /annum displaced	Total TonsCO ₂ /annum displaced	Total % TonsCO ₂ /annum displaced
A-003 (GF) - 1B,1P	44.14	7	308.98	38,108	5,781	4400.00	4400.00	1381.02	1.38	23.89
A-002 (GF) - 2B,3P	65.27	7	456.89	48,136	7,310	3660.00	3660.00	3650.24	3.65	49.93
A-009 (GF) - 2B,3P	67.85	1	67.85	7,485	1,136	3720.00	3720.00	-2583.51	-2.58	-227.32
A- 011 (GF) - 1B-2P	51.84	1	51.84	6,338	962	4130.00	4130.00	-3167.85	-3.17	-329.25
A- 018 (FF) - 2B-4P	73.04	6	438.24	36,996	5,614	3300.00	3300.00	2313.85	2.31	41.22
A-023 (FF)- 1B,1P	44.14	66	2913.24	291,643	44,194	4060.00	4060.00	40133.85	40.13	90.81
A-022 (FF)- 2B,3P	65.26	44	2871.44	237,386	35,979	3350.00	3350.00	32629.14	32.63	90.69
A-033 (FF)- 2B,3P	67.64	8	541.12	46,259	7,013	3400.00	3400.00	3612.92	3.61	51.52
A- 035 (FF)- 1B-2P	51.83	18	932.94	89,373	13,546	3790.00	3790.00	9756.29	9.76	72.02
A-159 (8F) - 1B-1P	45.24	9	407.16	40,495	6,144	4100.00	4100.00	2044.04	2.04	33.27
A-160 (8F) - 1B-2P	57.01	1	57.01	5,217	792	3750.00	3750.00	-2958.13	-2.96	-373.56
A-171 (11F) - 1B-1P	45.24	3	135.72	16,958	2,576	5010.00	5010.00	-2434.03	-2.43	-94.49
A-172 (11F) - 1B-2P	57.01	1	57.01	6,722	1,022	4510.00	4510.00	-3488.38	-3.49	-341.46
Total	736	172	9,239	871,117.10	132,069.44	51,180.00	51,180.00	80,889	80.89	61.25

Energy Savings

Energy Savings										
Typical Unit	Total Area	Quantity	Total Area	BaselineTotal kWh/annum	Baseline kgCO ₂ /annum	Passive Energy Efficiency kwh /annum	Passive Energy Efficiency & PVskwh /annum	Total kwh/annum displaced	Total % kwh/annum displaced	
A-003 (GF) - 1B,1P	44.14	7	308.98	38,108	5,781	9311	9311	28,797	75.57	
A-002 (GF) - 2B,3P	65.27	7	456.89	48,136	7,310	11437	11437	36,700	76.24	
A-009 (GF)- 2B,3P	67.85	1	67.85	7,485	1,136	1722	1722	5,763	76.99	
A- 011 (GF) - 1B-2P	51.84	1	51.84	6,338	962	1465	1465	4,873	76.88	
A- 018 (FF) - 2B-4P	73.04	6	438.24	36,996	5,614	9919	9919	27,077	73.19	
A-023 (FF)- 1B,1P	44.14	66	2913.24	291,643	44,194	81455	81455	210,188	72.07	
A-022 (FF)- 2B,3P	65.26	44	2871.44	237,386	35,979	66242	66242	171,145	72.10	
A-033 (FF)- 2B,3P	67.64	8	541.12	46,259	7,013	12621	12621	33,638	72.72	
A- 035 (FF)- 1B-2P	51.83	18	932.94	89,373	13,546	24326	24326	65,047	72.78	
A-159 (8F) - 1B-1P	45.24	9	407.16	40,495	6,144	11478	11478	29,017	71.66	
A-160 (8F) - 1B-2P	57.01	1	57.01	5,217	792	1463	1463	3,754	71.95	
A-171 (11F) - 1B-1P	45.24	3	135.72	16,958	2,576	4475	4475	12,484	73.61	
A-172 (11F) - 1B-2P	57.01	1	57.01	6,722	1,022	1738	1738	4,984	74.14	
Total	736	172	9,239	871,117.10	132,069.44	237,651.83	237,651.83	633,465.27	72.72	

APPENDIX D – SAMPLE BRUKL REPORT

Hotel Be Green BRUKL

BRUKL Output Document

Compliance with England Building Regulations Part L 2021

HM Government

Project name

Travelodge, The Marletts Shopping Centre, Burgess Hill As designed

Date: Wed Apr 23 14:49:50 2025

Administrative information

Building Details

Address: The Marletts Shopping Centre, Burgess Hill,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: Energy Simulator

Interface to calculation engine version: 10.10.0.199

BRUKL compliance module version: v6.1.d.0

Certifier details

Name:

Telephone number: 01344 628821

Address: Cudd Bentley Ashurst Manor, Sunninghill, SL5 7DD

Foundation area [m²]: 565

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	12.26
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	11.98
Target primary energy rate (TPER), kWh/m ² annum	131.81
Building primary energy rate (BPER), kWh/m ² annum	128.76
Do the building's emission and primary energy rates exceed the targets?	BER <= TER BPER <= TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.21	0.26	Partition 1
Floors	0.18	0.17	0.18	Internal Floor 1
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.16	0.16	Exposed Roof 1
Windows** and roof windows	1.6	1.2	1.2	Window 1
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.3	1.3	Door 1 (Personnel Door)
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]
U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]
U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]
* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.
^ For fire doors, limiting U-value is 1.8 W/m²K
NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	5

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Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- BED

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.2	3.5	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

2- Office

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.2	3.5	-	2	0.65
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

3- BATH

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.2	3.5	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

4- CIRCULATION

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

5- RESTURANT

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.2	3.5	-	2	0.65
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

6- KITCHEN

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.2	3.5	-	2	0.65
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

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1- Default DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	3.65	-
Standard value	2*	N/A

* Standard shown is for all types except absorption and gas engine heat pumps.

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
0.WC	-	-	0.4	-	-	-	-	-	-	-	N/A	
1.01BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
1.02BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
1.FAMWC	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.001BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.002BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.003BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.004BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.005BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.006BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.007BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.008BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.009BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.010BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.011BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.012BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.013BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.014BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.015BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.016BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.017BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.018BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.019BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.020BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.021BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	
2.022BATH	-	-	0.4	-	-	-	-	-	-	-	N/A	

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Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
2.023BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.024BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.025BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.026BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.027BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.028BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.029BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.030BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
2.031BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.001BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.002BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.003BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.004BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.005BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.006BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.007BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.008BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.009BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.010BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.011BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.012BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.013BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.014BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.015BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.016BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.017BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.018BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.019BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.020BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.021BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.022BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.023BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.024BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.025BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.026BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.027BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.028BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.029BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.030BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
3.031BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
4.001BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
4.002BATH	-	-	0.4	-	-	-	-	-	-	-	N/A
4.003BATH	-	-	0.4	-	-	-	-	-	-	-	N/A

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Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
4.004BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.005BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.006BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.007BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.008BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.009BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.010BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.011BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.012BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.013BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.014BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.015BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.016BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.017BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.018BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.019BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.020BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.021BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.022BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.023BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.024BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.025BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.026BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.027BATH		-	-	0.4	-	-	-	-	-	-	-	N/A
4.028BATH		-	-	0.4	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
1.ACCESS01		120	-	-
1.ACCESS02		120	-	-
1.FAMILY		120	-	-
2.001		120	-	-
2.002		120	-	-
2.003		120	-	-
2.004		120	-	-
2.005		120	-	-
2.006		120	-	-
2.007		120	-	-
2.008		120	-	-
2.009		120	-	-
2.010		120	-	-
2.011		120	-	-

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General lighting and display lighting		General luminaire		Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]	
	Standard value	95	80	0.3	
2.012		120	-	-	
2.013		120	-	-	
2.014		120	-	-	
2.015		120	-	-	
2.016		120	-	-	
2.017		120	-	-	
2.018		120	-	-	
2.019		120	-	-	
2.020		120	-	-	
2.021		120	-	-	
2.022		120	-	-	
2.023		120	-	-	
2.024		120	-	-	
2.025		120	-	-	
2.026		120	-	-	
2.027		120	-	-	
2.028		120	-	-	
2.029		120	-	-	
2.030		120	-	-	
2.031		120	-	-	
3.001		120	-	-	
3.002		120	-	-	
3.003		120	-	-	
3.004		120	-	-	
3.005		120	-	-	
3.006		120	-	-	
3.007		120	-	-	
3.008		120	-	-	
3.009		120	-	-	
3.010		120	-	-	
3.011		120	-	-	
3.012		120	-	-	
3.013		120	-	-	
3.014		120	-	-	
3.015		120	-	-	
3.016		120	-	-	
3.017		120	-	-	
3.018		120	-	-	
3.019		120	-	-	
3.020		120	-	-	
3.021		120	-	-	
3.022		120	-	-	
3.023		120	-	-	

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General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
3.024		120	-	-
3.025		120	-	-
3.026		120	-	-
3.027		120	-	-
3.028		120	-	-
3.029		120	-	-
3.030		120	-	-
3.031		120	-	-
4.001		120	-	-
4.002		120	-	-
4.003		120	-	-
4.004		120	-	-
4.005		120	-	-
4.006		120	-	-
4.007		120	-	-
4.008		120	-	-
4.009		120	-	-
4.010		120	-	-
4.011		120	-	-
4.012		120	-	-
4.013		120	-	-
4.014		120	-	-
4.015		120	-	-
4.016		120	-	-
4.017		120	-	-
4.018		120	-	-
4.019		120	-	-
4.020		120	-	-
4.021		120	-	-
4.022		120	-	-
4.023		120	-	-
4.024		120	-	-
4.025		120	-	-
4.026		120	-	-
4.027		120	-	-
4.028		120	-	-
0.OFFICE		120	-	-
0.STAFF		120	-	-
0.WC		110	-	-
1.01BATH		110	-	-
1.02BATH		110	-	-
1.FAMWC		110	-	-
2.001BATH		110	-	-

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ISSUED

General lighting and display lighting		General luminaire		Display light source	
Zone name		Efficacy [lm/W]		Efficacy [lm/W]	Power density [W/m²]
	Standard value	95		80	0.3
2.002BATH		110		-	-
2.003BATH		110		-	-
2.004BATH		110		-	-
2.005BATH		110		-	-
2.006BATH		110		-	-
2.007BATH		110		-	-
2.008BATH		110		-	-
2.009BATH		110		-	-
2.010BATH		110		-	-
2.011BATH		110		-	-
2.012BATH		110		-	-
2.013BATH		110		-	-
2.014BATH		110		-	-
2.015BATH		110		-	-
2.016BATH		110		-	-
2.017BATH		110		-	-
2.018BATH		110		-	-
2.019BATH		110		-	-
2.020BATH		110		-	-
2.021BATH		110		-	-
2.022BATH		110		-	-
2.023BATH		110		-	-
2.024BATH		110		-	-
2.025BATH		110		-	-
2.026BATH		110		-	-
2.027BATH		110		-	-
2.028BATH		110		-	-
2.029BATH		110		-	-
2.030BATH		110		-	-
2.031BATH		110		-	-
3.001BATH		110		-	-
3.002BATH		110		-	-
3.003BATH		110		-	-
3.004BATH		110		-	-
3.005BATH		110		-	-
3.006BATH		110		-	-
3.007BATH		110		-	-
3.008BATH		110		-	-
3.009BATH		110		-	-
3.010BATH		110		-	-
3.011BATH		110		-	-
3.012BATH		110		-	-
3.013BATH		110		-	-

THE MARTLETS, BURGESS HILL

ENERGY AND SUSTAINABILITY

ISSUED

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
3.014BATH		110	-	-
3.015BATH		110	-	-
3.016BATH		110	-	-
3.017BATH		110	-	-
3.018BATH		110	-	-
3.019BATH		110	-	-
3.020BATH		110	-	-
3.021BATH		110	-	-
3.022BATH		110	-	-
3.023BATH		110	-	-
3.024BATH		110	-	-
3.025BATH		110	-	-
3.026BATH		110	-	-
3.027BATH		110	-	-
3.028BATH		110	-	-
3.029BATH		110	-	-
3.030BATH		110	-	-
3.031BATH		110	-	-
4.001BATH		110	-	-
4.002BATH		110	-	-
4.003BATH		110	-	-
4.004BATH		110	-	-
4.005BATH		110	-	-
4.006BATH		110	-	-
4.007BATH		110	-	-
4.008BATH		110	-	-
4.009BATH		110	-	-
4.010BATH		110	-	-
4.011BATH		110	-	-
4.012BATH		110	-	-
4.013BATH		110	-	-
4.014BATH		110	-	-
4.015BATH		110	-	-
4.016BATH		110	-	-
4.017BATH		110	-	-
4.018BATH		110	-	-
4.019BATH		110	-	-
4.020BATH		110	-	-
4.021BATH		110	-	-
4.022BATH		110	-	-
4.023BATH		110	-	-
4.024BATH		110	-	-
4.025BATH		110	-	-

THE MARTLETS, BURGESS HILL

ENERGY AND SUSTAINABILITY

ISSUED

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
4.026BATH		110	-	-
4.027BATH		110	-	-
4.028BATH		110	-	-
0.CIRC		110	-	-
0.LIFTS		110	-	-
0.LLOBBY		110	-	-
0.STAIR		110	-	-
1.CIRC		110	-	-
1.STAIR		110	-	-
2.CIRC		110	-	-
2.STAIR		110	-	-
2.STAIR2		110	-	-
3.CIRC		110	-	-
3.STAIR		110	-	-
3.STAIR2		110	-	-
4.CIRC		110	-	-
4.STAIR		110	-	-
4.STAIR2		110	-	-
0.LINEN		110	-	-
0.PLANT		110	-	-
0.STORE		110	-	-
1.LINEN		110	-	-
2.LINEN		110	-	-
2.SERVICE		110	-	-
3.LINEN		110	-	-
3.SERVICE		110	-	-
4.LINEN		110	-	-
4.PLANT		110	-	-
4.SERVICE		110	-	-
0.BAR		120	110	1.364
0.RECEPTIO		120	110	1.227
0.RESTaura		120	110	1.364
0.KITCHEN		120	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1.ACCESS01	NO (-23.4%)	NO
1.ACCESS02	NO (-23.4%)	NO
1.FAMILY	NO (-63.8%)	NO
2.001	NO (-71.2%)	NO
2.002	NO (-24.5%)	NO
2.003	NO (-21.2%)	NO
2.004	NO (-21.2%)	NO

THE MARTLETS, BURGESS HILL ENERGY AND SUSTAINABILITY ISSUED

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
2.005	NO (-21.2%)	NO
2.006	NO (-71%)	NO
2.007	NO (-44.2%)	NO
2.008	NO (-41.9%)	NO
2.009	NO (-44.2%)	NO
2.010	NO (-44.2%)	NO
2.011	NO (-24.6%)	NO
2.012	NO (-6.3%)	NO
2.013	NO (-6.3%)	NO
2.014	NO (-6.3%)	NO
2.015	NO (-42.2%)	NO
2.016	NO (-78%)	NO
2.017	NO (-50.3%)	NO
2.018	NO (-50.3%)	NO
2.019	NO (-50.3%)	NO
2.020	NO (-50.3%)	NO
2.021	NO (-50.3%)	NO
2.022	NO (-50.3%)	NO
2.023	NO (-50.3%)	NO
2.024	NO (-50.3%)	NO
2.025	NO (-50%)	NO
2.026	NO (-50%)	NO
2.027	NO (-50%)	NO
2.028	NO (-50%)	NO
2.029	NO (-50%)	NO
2.030	NO (-50%)	NO
2.031	NO (-82.2%)	NO
3.001	NO (-71.2%)	NO
3.002	NO (-24.5%)	NO
3.003	NO (-21.2%)	NO
3.004	NO (-21.2%)	NO
3.005	NO (-21.2%)	NO
3.006	NO (-71%)	NO
3.007	NO (-44.2%)	NO
3.008	NO (-41.9%)	NO
3.009	NO (-44.2%)	NO
3.010	NO (-44.2%)	NO
3.011	NO (-24.6%)	NO
3.012	NO (-6.3%)	NO
3.013	NO (-6.3%)	NO
3.014	NO (-6.3%)	NO
3.015	NO (-42.2%)	NO
3.016	NO (-78%)	NO
3.017	NO (-50.3%)	NO
3.018	NO (-50.3%)	NO
3.019	NO (-50.3%)	NO
3.020	NO (-50.3%)	NO
3.021	NO (-50.3%)	NO
3.022	NO (-50.3%)	NO

THE MARTLETS, BURGESS HILL ENERGY AND SUSTAINABILITY ISSUED

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
3.023	NO (-50.3%)	NO
3.024	NO (-50.3%)	NO
3.025	NO (-50%)	NO
3.026	NO (-50%)	NO
3.027	NO (-50%)	NO
3.028	NO (-50%)	NO
3.029	NO (-50%)	NO
3.030	NO (-50%)	NO
3.031	NO (-82.2%)	NO
4.001	NO (-71.2%)	NO
4.002	NO (-24.5%)	NO
4.003	NO (-21.2%)	NO
4.004	NO (-21.2%)	NO
4.005	NO (-21.2%)	NO
4.006	NO (-71%)	NO
4.007	NO (-44.2%)	NO
4.008	NO (-41.9%)	NO
4.009	NO (-44.2%)	NO
4.010	NO (-44.2%)	NO
4.011	NO (-24.6%)	NO
4.012	NO (-6.3%)	NO
4.013	NO (-6.3%)	NO
4.014	NO (-6.3%)	NO
4.015	NO (-42.2%)	NO
4.016	NO (-78%)	NO
4.017	NO (-50.3%)	NO
4.018	NO (-50.3%)	NO
4.019	NO (-50.3%)	NO
4.020	NO (-50.3%)	NO
4.021	NO (-50.3%)	NO
4.022	NO (-50.3%)	NO
4.023	NO (-50.3%)	NO
4.024	NO (-50.3%)	NO
4.025	NO (-50%)	NO
4.026	NO (-50%)	NO
4.027	NO (-50%)	NO
4.028	NO (-50%)	NO
0.OFFICE	N/A	N/A
0.STAFF	N/A	N/A
0.WC	N/A	N/A
1.01BATH	N/A	N/A
1.02BATH	N/A	N/A
1.FAMWC	N/A	N/A
2.001BATH	N/A	N/A
2.002BATH	N/A	N/A
2.003BATH	N/A	N/A
2.004BATH	N/A	N/A
2.005BATH	N/A	N/A
2.006BATH	N/A	N/A

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ENERGY AND SUSTAINABILITY

ISSUED

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
2.007BATH	N/A	N/A
2.008BATH	N/A	N/A
2.009BATH	N/A	N/A
2.010BATH	N/A	N/A
2.011BATH	N/A	N/A
2.012BATH	N/A	N/A
2.013BATH	N/A	N/A
2.014BATH	N/A	N/A
2.015BATH	N/A	N/A
2.016BATH	N/A	N/A
2.017BATH	N/A	N/A
2.018BATH	N/A	N/A
2.019BATH	N/A	N/A
2.020BATH	N/A	N/A
2.021BATH	N/A	N/A
2.022BATH	N/A	N/A
2.023BATH	N/A	N/A
2.024BATH	N/A	N/A
2.025BATH	N/A	N/A
2.026BATH	N/A	N/A
2.027BATH	N/A	N/A
2.028BATH	N/A	N/A
2.029BATH	N/A	N/A
2.030BATH	N/A	N/A
2.031BATH	N/A	N/A
3.001BATH	N/A	N/A
3.002BATH	N/A	N/A
3.003BATH	N/A	N/A
3.004BATH	N/A	N/A
3.005BATH	N/A	N/A
3.006BATH	N/A	N/A
3.007BATH	N/A	N/A
3.008BATH	N/A	N/A
3.009BATH	N/A	N/A
3.010BATH	N/A	N/A
3.011BATH	N/A	N/A
3.012BATH	N/A	N/A
3.013BATH	N/A	N/A
3.014BATH	N/A	N/A
3.015BATH	N/A	N/A
3.016BATH	N/A	N/A
3.017BATH	N/A	N/A
3.018BATH	N/A	N/A
3.019BATH	N/A	N/A
3.020BATH	N/A	N/A
3.021BATH	N/A	N/A
3.022BATH	N/A	N/A
3.023BATH	N/A	N/A
3.024BATH	N/A	N/A

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ENERGY AND SUSTAINABILITY

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Zone	Solar gain limit exceeded? (%)	Internal blinds used?
3.025BATH	N/A	N/A
3.026BATH	N/A	N/A
3.027BATH	N/A	N/A
3.028BATH	N/A	N/A
3.029BATH	N/A	N/A
3.030BATH	N/A	N/A
3.031BATH	N/A	N/A
4.001BATH	N/A	N/A
4.002BATH	N/A	N/A
4.003BATH	N/A	N/A
4.004BATH	N/A	N/A
4.005BATH	N/A	N/A
4.006BATH	N/A	N/A
4.007BATH	N/A	N/A
4.008BATH	N/A	N/A
4.009BATH	N/A	N/A
4.010BATH	N/A	N/A
4.011BATH	N/A	N/A
4.012BATH	N/A	N/A
4.013BATH	N/A	N/A
4.014BATH	N/A	N/A
4.015BATH	N/A	N/A
4.016BATH	N/A	N/A
4.017BATH	N/A	N/A
4.018BATH	N/A	N/A
4.019BATH	N/A	N/A
4.020BATH	N/A	N/A
4.021BATH	N/A	N/A
4.022BATH	N/A	N/A
4.023BATH	N/A	N/A
4.024BATH	N/A	N/A
4.025BATH	N/A	N/A
4.026BATH	N/A	N/A
4.027BATH	N/A	N/A
4.028BATH	N/A	N/A
0.BAR	N/A	N/A
0.RECEPTIO	NO (-7.4%)	NO
0.RESTAURA	NO (-6%)	NO
0.KITCHEN	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	YES

THE MARTLETS, BURGESS HILL

ENERGY AND SUSTAINABILITY

ISSUED

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m ²]	3228.3	3228.3		Retail/Financial and Professional Services
External area [m ²]	3581.3	3581.3		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	SOU	SOU		Offices and Workshop Businesses
Infiltration [m ³ /hm ² @ 50Pa]	5	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	1006.4	1370.9		Storage or Distribution
Average U-value [W/m ² K]	0.28	0.38	100	Hotels
Alpha value* [%]	23.8	19.51		Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
				Residential Spaces
				Non-residential Institutions: Community/Day Centre
				Non-residential Institutions: Libraries, Museums, and Galleries
				Non-residential Institutions: Education
				Non-residential Institutions: Primary Health Care Building
				Non-residential Institutions: Crown and County Courts
				General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger Terminals
				Others: Emergency Services
				Others: Miscellaneous 24hr Activities
				Others: Car Parks 24 hrs
				Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	25.27	23.57
Cooling	6.38	2.99
Auxiliary	4.02	5.42
Lighting	11.82	9.25
Hot water	36.99	48.95
Equipment*	20.99	20.99
TOTAL**	84.48	90.18

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
 ** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	1.48
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>1.48</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	296.79	299.92
Primary energy [kWh/m ²]	128.76	131.81
Total emissions [kg/m ²]	11.98	12.26

THE MARTLETS, BURGESS HILL

ENERGY AND SUSTAINABILITY

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HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	213.7	49.7	19.9	5.6	0	2.98	2.49	3.2	3.5
Notional	238.3	44.9	25.1	2.8	0	2.64	4.4	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	10.6	195	0.9	23.9	11.1	3.17	2.27	3.2	3.5
Notional	0.4	196.7	0	12.4	9.9	2.64	4.4	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	377.5	6.9	35.2	0.8	17.4	2.98	2.49	3.2	3.5
Notional	379	12.3	39.9	0.8	26.1	2.64	4.4	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	142	89.1	49.3	0	0	0.8	0	1	0
Notional	142.7	88.2	29.6	0	0	1.34	0	----	----
[ST] No Heating or Cooling									
Actual	121	249.6	0	0	0	0	0	0	0
Notional	122.7	252	0	0	0	0	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	54.4	360.7	4.8	44.2	22.5	3.17	2.27	3.2	3.5
Notional	18.2	284.2	1.9	17.9	21.5	2.64	4.4	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	8.2	732.8	0.7	89.8	40.5	3.17	2.27	3.2	3.5
Notional	0	636	0	40.2	33.6	0	4.4	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

THE MARTLETS, BURGESS HILL ENERGY AND SUSTAINABILITY ISSUED

Commercial Unit Be Green BRUKL

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

The Martlets Shopping Centre, Burgess Hill

As designed

Date: Wed Apr 23 15:23:13 2025

Administrative information

Building Details

Address: The Martlets Shopping Centre, Burgess Hill,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: Energy Simulator

Interface to calculation engine version: 10.10.0.199

BRUKL compliance module version: v6.1.d.0

Certifier details

Name:

Telephone number: 01344 628821

Address: Cudd Bentley Ashurst Manor, Sunninghill, SL5 7DD

Foundation area [m²]: 402

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²·annum	5.1
Building CO ₂ emission rate (BER), kgCO ₂ /m²·annum	4.96
Target primary energy rate (TPER), kWh/m²·annum	55.35
Building primary energy rate (BPER), kWh/m²·annum	54.09
Do the building's emission and primary energy rates exceed the targets?	BER <= TER BPER <= TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.18	0.18	Wall 1
Floors	0.18	0.18	0.18	Exposed Floor 1
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.16	0.16	Exposed Roof 1
Windows** and roof windows	1.6	1.2	1.2	Window 1
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors
U _a -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows. ** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position. ^ For fire doors, limiting U-value is 1.8 W/m²K NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	5

THE MARTLETS, BURGESS HILL

ENERGY AND SUSTAINABILITY

ISSUED

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Retail

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.5	6	-	1.1	0.8
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- Circulation

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Default DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
L1-ALDI		120	120	1.25
L1-STAIR1		120	120	1.25
L1-STAIR2		120	120	1.25

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L1-ALDI	NO (-5.4%)	NO
L1-STAIR1	N/A	N/A
L1-STAIR2	NO (-72.7%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	YES

THE MARTLETS, BURGESS HILL

ENERGY AND SUSTAINABILITY

ISSUED

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m ²]	2006.4	2006.4	100	Retail/Financial and Professional Services
External area [m ²]	5392.8	5392.8		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	SOU	SOU		Offices and Workshop Businesses
Infiltration [m ³ /hm ² @ 50Pa]	5	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	1213.1	1198.49		Storage or Distribution
Average U-value [W/m ² K]	0.22	0.22		Hotels
Alpha value* [%]	15.6	11.96		Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				
				Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
				Residential Spaces
				Non-residential Institutions: Community/Day Centre
				Non-residential Institutions: Libraries, Museums, and Galleries
				Non-residential Institutions: Education
				Non-residential Institutions: Primary Health Care Building
				Non-residential Institutions: Crown and County Courts
				General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger Terminals
				Others: Emergency Services
				Others: Miscellaneous 24hr Activities
				Others: Car Parks 24 hrs
				Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	5.35	4.73
Cooling	7.12	4.67
Auxiliary	4.95	9.84
Lighting	16.64	17.16
Hot water	1.7	1.7
Equipment*	20.26	20.26
TOTAL**	35.75	38.1

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
 ** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0.67
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>0.67</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	160.77	117.27
Primary energy [kWh/m ²]	54.09	55.35
Total emissions [kg/m ²]	4.96	5.1

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HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	47.5	110	3.8	7.2	5	3.52	4.22	3.5	6
Notional	36.1	75.2	3.8	4.7	10	2.64	4.4	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	292	63.1	101.4	0	0	0.8	0	1	0
Notional	293.6	180.5	60.9	0	0	1.34	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

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APPENDIX E – SAMPLE EPC

Energy Performance Certificate		HM Government	
Non-Domestic Building			
The Marletts Shopping Centre Burgess Hill		Certificate Reference Number: 5870-0323-7469-1798-5163	
This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document <i>Energy Performance Certificates for the construction, sale and let of non-dwellings</i> available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.			
Energy Performance Asset Rating			
More energy efficient			
A+ A 0-25 B 26-50 C 51-75 D 76-100 E 101-125 F 126-150 G Over 150			
Net zero CO₂ emissions 9 This is how energy efficient the building is.			
Less energy efficient			
Technical information		Benchmarks	
Main heating fuel: Grid Supplied Electricity		Buildings similar to this one could have ratings as follows:	
Building environment: Air Conditioning		9 If newly built	
Total useful floor area (m ²): 3228.3		34 If typical of the existing stock	
Building complexity: Level 3			
Building emission rate (kgCO ₂ /m ² per year): 12.26			
Primary energy use (kWh/m ² per year): 131.9			

APPENDIX F – MODELLING INPUTS DETAILED

Heating & Cooling		
System Type	Efficiency/(S)COP	Efficiency /(S)EER
VRF System	3.2	3.5
ASHP Heat Network (For Residential Side)	3	

Hot Water System	
Type	Efficiency
Non-Residential - ASHP	3.65

Mechanical Ventilation Heating Recovery (Typical Unit Chosen)				
Area Type	Supply/Extract SFP (W/l/s)	Heat Recovery Efficiency (%)	Exhaust Flow Rate (l/s/m²)	Exhaust SFP (W/l/s)
Offices/ Restaurant and Reception Area's	2.0	65	x	x
WC's	x	x	5	0.4
Apartments	0.41	93	x	x

Non-Residential Building Fabric U-Values	
Element	U-value (W/m²K)
Ground Floor	0.18
External Wall (Cavity wall)	0.18
Roof	0.16

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Glazing	1.2 (g-value of 0.36 for Windows)
External Doors	1.3

Residential Building Fabric	
	U-value (W/m2K)
Ground Floor	0.12
External Wall	0.15
Sheltered Walls (Flat To Unheated Corridor/areas)	0.15
Roof	0.12
Windows (Double Glazed) and Patio Doors	Double Glazed 1.2 (G Value of 0.41 as per ES)
External Doors	1.4

Air Permeability Rate: 5 for Non-Resi Elements 3 for Residential Elements	
Renewables (Required for Net-Zero Target)	
PV Total Installed Capacity (KWp)	PV Inclination
0	South-Facing 30-degree inclination
Other Renewables (please specify details below): N/A	

Lighting	
Lighting Type	lumens per circuit watt
LED	Bedroom – 120 lm/w Office Area's – 120 lm/w WC – 110 lm/w Circulation Area's – 110 lm/W Apartments – 100 lm/w

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Non-Residential Thermal Bridging – PSI Values

<u>Junction Detail</u>	<u>W/mK</u>
Below are Junctions involving Metal Cladding	
Roof-Wall	0.14
Wall-Ground Floor	0.6
Wall-Wall (Corner)	0.13
Wall-floor (Not Ground Floor)	0
Lintel above Door or Window	0.65
Sill Below Window	0.65
Jamb at Window or Door	0.65
Below are Junctions NOT involving Metal Cladding	
Roof-Wall	0.06
Wall-Ground Floor	0.08
Wall-Wall (Corner)	0.05
Wall-floor (Not Ground Floor)	0.04
Lintel above Door or Window	0.15
Sill Below Window	0.02
Jamb at Window or Door	0.03

Residential Thermal Bridging – PSI Values

<u>Sap Ref</u>	<u>Junction Detail</u>	<u>Ψ Value</u>	<u>Source</u>
E2	Other Lintels (Including other steel lintels)	0.025	Unilin Insulation UK Ltd
E3	Sill	0.034	Unilin Insulation UK Ltd
E4	Jamb	0.021	Unilin Insulation UK Ltd
E5	Ground Floor	0.065	Marmox UK
E7	Intermediate Floor between dwellings (in blocks of flats)	0.05	Unilin Insulation UK Ltd
E15	Flat roof (With Parapet)	0.111	Unilin Insulation UK Ltd
E16	Corner (normal)	0.038	Unilin Insulation UK Ltd
E17	Corner (inverted)	-0.048	Unilin Insulation UK Ltd
E18	Party wall between dwellings	0.069	Unilin Insulation UK Ltd
P1	Party Wall – Ground Wall	0.161	Unilin Insulation UK Ltd
P3	Intermediate floor between dwellings (in blocks of flats)	0	Table K1 Default
P4	Party Wall (Roof)	0.48	Table K1 Default



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