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Climate Change and Energy Efficiency Statement

Blowers Wood, Maidstone Road, Hempstead

Iceni Projects Limited on behalf of
Redrow Homes Ltd

January 2023

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ON BEHALF OF REDROW
HOMES LTD

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Climate Change and Energy Efficiency
Statement
BLOWERS WOOD, MAIDSTONE ROAD, HEMPSTEAD

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1. EXECUTIVE SUMMARY

- 1.1 Icen Projects Ltd has been commissioned by Redrow Homes Ltd to produce a Climate Change and Energy Efficiency Statement to support the planning application for the proposed development at Blowers Wood, Maidstone Road, Hempstead, Gillingham, ME7 3DT.
- 1.2 This application proposes the development of the site to provide up to 88 new homes, of which 25% will be delivered as affordable housing, alongside parking, access, open space and landscaping.
- 1.3 Sustainability is a core consideration of the application and has been incorporated from the project outset. Resource and water efficiency have been maximised, whilst the production of waste and pollution is to be minimised, thus ensuring the impact of the proposals on its immediate surroundings and the environment as a whole is minimised.
- 1.4 By designing to rigorous energy standards, and employing air source heat pump (ASHP) technology, the application will respond directly to the Climate Emergency declared by the Council in April 2019. These measures combine to provide an approximate carbon dioxide emissions saving of 59.1%, compared to the Part L:2021 baseline, significantly exceeding the requirements of Medway Council.
- 1.5 Consideration has been given to the Medway Local Plan in the overall formulation of this strategy, aiming to minimise the environmental impact of the proposed development during construction and operation, and to ensure the development is constructed to rigorous sustainability standards.
- 1.6 The proposed strategy has been based around the objectives of the Local Plan Policies BNE1 (General Principles for Built Development), BNE4 (Energy Efficiency) and BNE22 (Environmental Enhancement). In summary, based on this strategy, the proposed development;
- will make efficient use of land;
 - will mitigate the risk of surface water flooding through the employment of a surface water drainage strategy;
 - will minimise internal water consumption to 105 litres per person per day;
 - will incorporate low-impact materials, according to the BRE Green Guide to Specification;
 - will minimise waste production during construction and maximise the proportion of waste to be diverted from landfill;

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- will incorporate measures to improve site biodiversity, including native hedgerow and tree planting;
 - will ensure land, noise and water pollution are minimised as far as possible;
 - will minimise energy demand through the specification of low U-values, low air permeability and low thermal bridging to reduce heat loss;
 - will be fossil fuel free, utilising air source heat pump (ASHP) technology to serve the space and water heating demands of the proposed dwellings; and
 - will achieve an approximate 59.1% reduction in CO₂ emissions, following the Energy Hierarchy methodology.

1.7 Overall, the proposals constitute sustainable development in accordance with national and local policy requirements and will provide a development that seeks to promote these principles in operation.

2. INTRODUCTION

- 2.1 Icen Projects Ltd has been commissioned by Redrow Homes Ltd to produce a Climate Change and Energy Efficiency Statement to support the planning application for the proposed development at Blowers Wood, Maidstone Road, Hempstead, Gillingham, ME7 3DT.

Report Objective

- 2.2 This document details the sustainable design and construction measures adopted by the proposed development and gives an overview of the design proposals that will ensure the development operates in a sustainable manner over the lifespan of the scheme. The Climate Change and Energy Efficiency Statement report headlines will provide a framework for the project team to operate consistently within sustainability guidelines set out by Medway Council.
- 2.3 The report is structured to meet these guidelines as follows:
- Section 3 discusses the planning context and policies which are relevant to sustainability;
 - Section 4 discusses the development response to the policy drivers for sustainability;
 - Section 5 sets out the development's energy strategy to minimise CO₂ emissions; and
 - Section 6 summarises the development's design response.

Site and Surroundings

- 2.4 The application site (Appendix A1) is located on the southern edge of the settlement of Hempstead, which is approximately 6.5 km south of Gillingham, within the administrative boundary of Medway Council. The site itself is currently a vacant field, with a Public Right of Way (PRoW; GB40) bisecting the site north-to-south, connecting Lambsfrith Grove to the north with Maidstone Road to the south.
- 2.5 The site is bounded by Hoath Way Road (A278) to the east, and Maidstone Road to the south, beyond which lies the M2 motorway. Blowers Wood, which comprises ancient woodland, forms the northern and western boundaries, separating the site from low density housing to the north, and open fields to the west. The surrounding area is predominantly residential in nature to the north and east, and rural towards the south and west, as demonstrated in Figure 2.1 below

Figure 2.1 The site

 Site location



The Proposed Development

2.6 The description of the proposed development is as follows:

“Construction of 88 dwellings including 25% affordable together with associated parking, access, open space, landscaping and SuDS.”

2.7 The proposed development will provide the following mix of residential dwellings:

- 3 no. 1-bedroom apartments
- 10 no. 1-bedroom maisonettes
- 6 no. 2-bedroom apartments
- 10 no. 2-bedroom houses
- 33 no. 3-bedroom houses
- 13 no. 4-bedroom houses
- 13 no. 5-bedroom houses

2.8 The image below shows the proposed site layout, based on drawings provided by FPCR Environment and Design Ltd.

Figure 2.2 Proposed site layout



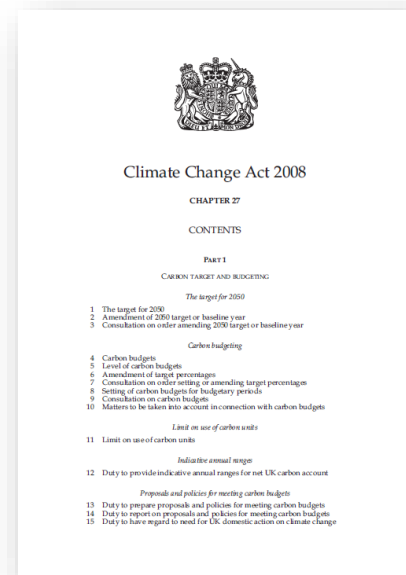
3. PLANNING AND REGULATORY CONTEXT

- 3.1 Built environment sustainability is incorporated within policy and regulation at a national and local level, as set out below.

National

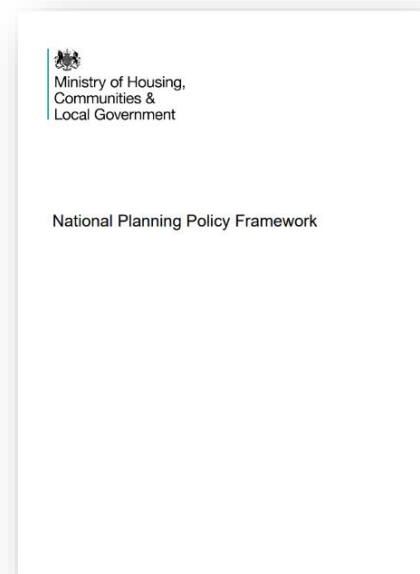
Climate Change Act 2008

- 3.2 On 26th November 2008, the UK Government published the Climate Change Act 2008; the world's first long-term legally binding framework to mitigate against climate change. Within this framework, the Act sets legally binding targets to increase greenhouse gas emission reductions through action in the UK and abroad from the 60% target set out in the Energy White Paper, to 80% by 2050.
- 3.3 As required under Section 34 of the Climate Change Act, the Sixth Annual Carbon Budget was accepted by the Government in April 2021. This sets out a budget for UK emissions for the period 2033 – 2037.
- 3.4 Following a commitment in June 2019, the Climate Change Act has been amended to target net zero carbon emissions by 2050.



National Planning Policy Framework

- 3.5 The Ministry of Housing, Communities & Local Government determines national policies on different aspects of planning and the rules that govern the operation of the system. Accordingly, the National Planning Policy Framework (NPPF), which came into force in March 2012 and was updated in February 2019, aims to strengthen local decision making. Additional updates have since been made through the latter half of 2020 and in January and July 2021 to reflect changes related to use classes, permitted development rights, the calculation of housing need, and requirements to achieve beauty alongside sustainability.



3.6 Paragraphs 10 and 11 of the NPPF confirm that at the heart of this document is a “presumption in favour of sustainable development”, and that development proposals that accord with an up-to-date development plan should be approved without delay.

3.7 Paragraph 7 states that the purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

3.8 Achieving sustainable development means that the planning system has three overarching activities, which are interdependent and need to be pursued in mutually supportive ways, so that opportunities can be taken to secure net gains across each of the different objectives:

- **An Economic Role** – ensuring the provision of land and infrastructure needed to help build a strong, responsive and competitive economy.
- **A Social Role** – supplying the required amount of housing while at the same time ensuring and building strong, vibrant and healthy communities. Ensuring that the built environment is sited around accessible local services which help support a community’s health, social and cultural well-being.
- **An Environmental Role** – ensuring development contributes to the protection and enhancement of the natural, built and historic environment through the improvement of biodiversity, minimising the use of natural resources and production of pollution / waste, and guaranteeing sufficient adaptation to climate change.

Future Homes Standard 2025 (March 2019)

3.9 Within the Spring Statement 2019, the Chancellor announced the introduction of the Future Homes Standard 2025. The Standard will mandate the end of fossil fuel heating systems in new homes from 2025, and target “world-leading levels of energy efficiency”. In doing this, the Standard aims to utilise green technology to reduce environmental impacts, as well as reducing consumer energy bills.

3.10 This Standard is expected to build on the Prime Minister’s Clean Growth Grand Challenge missions, which aims to at least halve the energy usage of new build properties by 2030. It also looks to halve the costs of renovating existing buildings to achieve a similar standard of energy efficiency as new buildings, whilst improving their quality and safety.

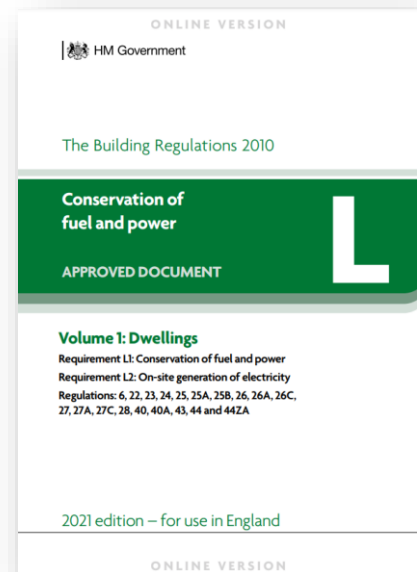


Part L:2021 of the Building Regulations

Part L of the Building Regulations relates to the conservation of fuel and power, and applies to both new and existing buildings. The current edition covers the energy efficiency requirements of the building regulations as set out in Part L of Schedule 1 to the Building Regulations. Technical guidance is contained in two Part L Approved Documents.

3.11 The documents of relevance to this scheme include:

- **Approved Document L Volume 1: Domestic Buildings.** This provides the methodology for new build, domestic buildings to meet current energy efficiency standards, including backstop U-values, carbon dioxide emissions calculations and minimising the risk of overheating. Carbon dioxide emissions reductions are prescribed for 'regulated' emissions only, and relate to heating, hot water, lighting, auxiliary and cooling (where specified). Emissions from domestic appliances (cooking, for example) are considered to be unregulated emissions, and are excluded from the analysis.



Local

- 3.12 In determining the local context, the Medway Local Plan (2003) sets out policy relevant to sustainable development.

Medway Local Plan (2003)

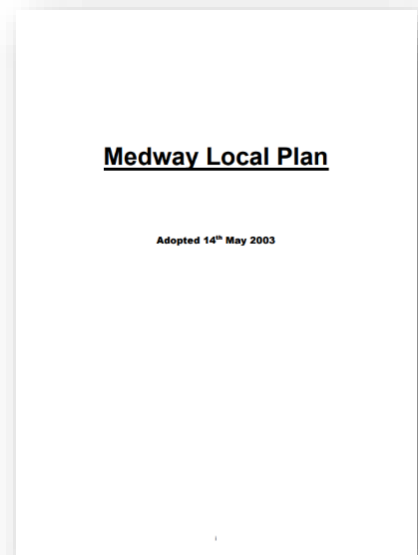
- 3.13 The Local Plan provides the overarching principles of the Local Development Framework, by which the essential development needs within the council should be delivered.

- 3.14 **Policy BNE1: General Principles for Built Development –** The design of development (including extensions, alterations and conversions) should be appropriate in relation to the character, appearance and functioning of the built and natural environment by:

- being satisfactory in terms of use, scale, mass, proportion, details, materials, layout and siting; and
- respecting the scale, appearance and location of buildings, spaces and the visual amenity of the surrounding area; and
- where appropriate, providing well structured, practical and attractive areas of open space.

- 3.15 **Policy BNE4: Energy Efficiency –** Energy efficiency measures will be sought within development proposals, providing there is no detrimental impact on amenity. In particular, proposals should have regard to:

- appropriate siting, form, orientation and layout of the buildings and the appropriate size and location of windows to maximise passive solar heating, natural lighting and natural ventilation; and
- the appropriate use and siting of soft landscaping to act as shading or shelterbelts; and • energy efficient technology including solar panels, combined heat and power/district heating schemes and district wind power schemes; and
- high standards of insulation and other heat retaining features; and
- the use of building materials of the lowest possible embodied energy, except where there is an overriding need to avoid damage to the architectural or historic interest of Listed Buildings and buildings in Conservation Areas.



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- 3.16 **Policy BNE22: Environmental Enhancement** – Development leading to the protection and improvement of the appearance and environment of existing and proposed areas of development, transport corridors, open spaces and areas adjacent to the River Medway will be permitted.

Other Considerations

Declaration of a Climate Emergency (April 2019)

- 3.17 On the 26th April 2019, Medway Council declared a climate change emergency, with the Council noting that the United Nations Intergovernmental Panel on Climate Change have warned that we have 12 years to make the necessary changes to limit a rise in global temperatures to 1.5°C. Failure to act will see a marked increase in sea levels and flooding, extreme and abrupt changes to weather patterns, crop failures, extinctions of plant, insect and animal species and global economic disruption and crisis.
- 3.18 In response, the Council therefore:
- Declared a Climate Emergency; and
 - Noted that current targets are inadequate to respond to the challenge of keeping global temperature rises below 1.5°C.
- 3.19 The Council also requested that:
- Cabinet establish a Medway Climate Change Working Group to respond to this challenge, which meets in public and includes representation from all party groups, in order to create a clear action plan for Medway;
 - Cabinet set more ambitious targets for Medway to become carbon neutral; and
 - The Chief Executive write to the Chancellor of the Exchequer stating the concern of the Council with respect to the above, the likely national impact on the economy and on the wellbeing of citizens, and requesting government funding be made available to implement swift appropriate actions in response.

4. SUSTAINABILITY STATEMENT

- 4.1 The Climate Change and Energy Efficiency Statement for the proposed development is divided into two main parts.
- 4.2 The sustainability strategy for the proposed development has been assessed in line with the guidance set out within relevant policies of the Medway Local Plan (2003). This enables a holistic sustainability approach to be set out for the proposed development. The Medway Local Plan (2003) requires that all new development provides sustainable, high quality and inclusive design, and this therefore represents best practice guidance to meet high standards of sustainable design and construction.
- 4.3 The carbon dioxide (CO₂) emissions reduction strategy for the proposed dwellings to be delivered as part of the development is based on the energy hierarchy to provide a rigorous methodology, which maximises cost-effective opportunities for emissions reduction, as detailed in Section 5.

Sustainable Design and Construction

- 4.4 In line with the guidance provided in the Medway Local Plan, the sustainability features of the proposed development are outlined below.
- 4.5 Issues related to energy conservation, renewables and reducing greenhouse gases follow in a dedicated section.

Making Effective Use of Land

- 4.6 As shown below, the site currently comprises a vacant greenfield area of land, bisected by a Public Right of Way (PRoW; GB40), which connects Lambsfrith Grove to the north with Maidstone Road to the south.

Figure 4.1 Current Site

 Approximate site boundary



- 4.7 Whilst currently comprising vacant greenfield, the site will form an extension to the existing settlement of Hempstead, the centre of which is located to the north-west of the site. This will provide much needed housing within the District, responding to the present local need and market demand.

Location and Transport

- 4.8 Accessibility to public transport connections contributes to the sustainability of a site's location. As demonstrated within the Transport Assessment, prepared by GTA Civils and Transport, Rainham (Kent) railway station is located approximately 4.5 km to the north-east of the site. This station provides frequent access between London Victoria, London St Pancras International, St Albans City via London Blackfriars, Ramsgate, Faversham and Dover via Southeastern and Thameslink services.
- 4.9 The nearest bus stops are located on Wigmore Road, approximately 230m to the east of the site. These stops are served by a number of services, including the following:

- Route 113, which runs between Chatham and Wigmore via Luton and Hempstead, with an hourly service on Mondays to Saturdays;
- Route 116, which runs between Chatham and Hempstead Valley via Gillingham, Medway, Rainham and Wigmore, with a half-hourly service on Mondays to Saturdays;
- Route 130, which runs between Chatham and Maidstone via Parkwood, Wigmore, Hempstead Valley, Bredhurst and Boxley, with an hourly service on Mondays to Fridays, and four services per day on Saturdays;

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- Route 132, which runs between Chatham and Hempstead Valley via Rainham, with services running every 20 minutes on Mondays to Fridays, and every half an hour on Saturdays and Sundays;
 - Route 659, which runs between Gillingham and Rochester via Rainham, Parkwood, Wigmore, Hempstead Valley, Walderslade and Chatham, with services provided on schooldays only; and
 - Route M1, which runs between Lords Wood and Hempstead Valley via Walderslade, Wayfield, Luton, Darland, Rainham and Wigmore, with three services per day on Saturdays.

4.10 As detailed above, public footpath GB40 runs directly through the site at the west. It runs north to south, connecting to Lambsfrith Grove in the north. It is intended that this footpath be retained as part of the proposed development, albeit with a slight diversion route. In connecting the site to Lambsfrith Grove, pedestrian access to Sharstead Road, on which the Hempstead Valley shopping centre is located, is provided. The Hempstead Valley shopping centre contains a variety of commercial and retail shops and facilities, including a large supermarket, retail outlets, restaurants and cafes. Additionally, there is good footway provision along Maidstone Road which provides pedestrian access to the bus stops located nearest to the site. Although there are no dedicated cycle lanes within the immediate 500m vicinity of the local highway network, cycling is safe to do so along surrounding residential roads leading to the local and nearby towns of Hempstead and Rainham. Furthermore, it is understood that new cycle routes and cycle links from Gillingham to Hempstead have been proposed, which will include several improvements within the town centre area close to the site. To facilitate walking and cycling within the proposed development, it is intended that the proposed access to the site from Maidstone Road will be 5.5m wide to provide a shared surface for vehicles and pedestrians. It is intended that two cycle parking spaces will be provided per 3-, 4- and 5-bedroom house, and that communal cycle stores be included for the proposed apartments and maisonettes.

4.11 With respect to car parking, there will be a communal provision for the proposed apartments, with the equivalent of one parking space per 1-bedroom unit. For the proposed houses, 1.5 spaces will be provided for each 2-bedroom unit, and two spaces per 3-, 4- and 5-bedroom unit. In addition to this, 0.25 visitor car parking spaces will be provided per dwelling, and all proposed units will be provided with electric vehicle (EV) charging.

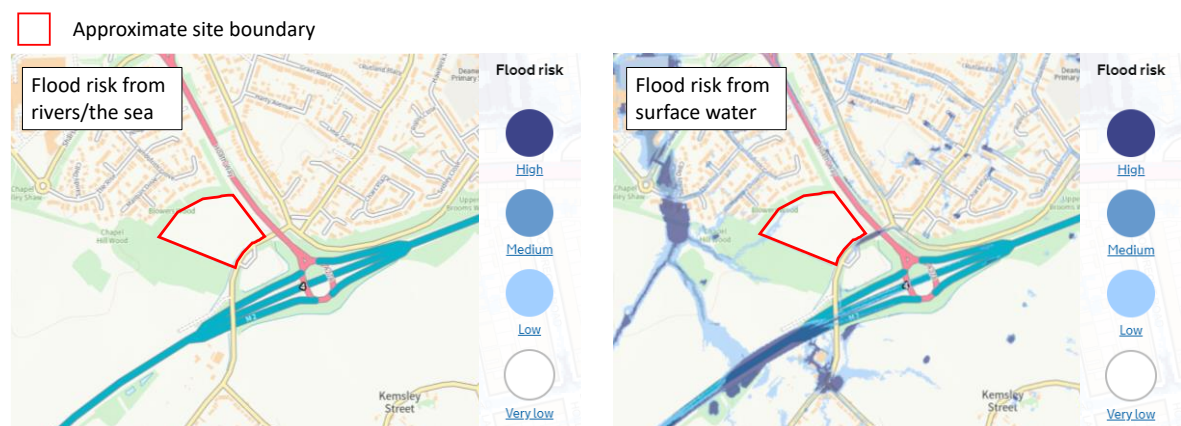
4.12 As a result of the proposed redevelopment of the site, it is expected that there will be approximately 44 two-way vehicle trips during each of the morning and evening peak hours, and 418 two-way vehicle trips per weekday. Overall, it is considered that the impact of the additional vehicle trips generated onto the network as a result of the proposed development will be negligible and therefore no further highway assessment is required.

- 4.13 A Framework Travel Plan has also been prepared by GTA Civils and Transport, the objective of which is to address the needs of future residents to access a full range of facilities and activities, whilst also minimising the volume of traffic generated by the development by reducing car dependency and encouraging non-car modes wherever possible. Measures proposed within the Framework Travel Plan to encourage sustainable travel include:
- Displaying up-to-date details of bus services, including bus stop locations, route information and service frequencies, in a location accessible to residents;
 - Displaying information and advice concerning safe cycle and pedestrian routes in a location accessible to residents; and
 - Distributing sustainable transport information to all new residents as part of the standard travel 'welcome' packs and displaying this information on a new bespoke website.
- 4.14 The Transport Assessment concludes that there are no unacceptable highway or transport impacts that cannot be mitigated as a result of the proposed development.

Reducing Flood Risk and Surface Water Run-off

- 4.15 Figure 4.2 below confirms that the proposed development site is located entirely within Flood Zone 1, indicating a very low risk from tidal and fluvial sources. The vast majority of the site is also demonstrated to be at very low risk of flooding from surface water source. However, it is noted that there is an overland flow route that originates within the north-western corner of the site, and that the area associated with this overland flow is at low risk of flooding. The Flood Risk Assessment, prepared by GTA Civils and Transport, states, however, that due to the location of this overland flow route outside of the proposed area of development, there will be no risk to future residents or buildings arising from the identified overland flow route.

Figure 4.2 Extract from the Environment Agency's online flood map



- 4.16 Furthermore, as detailed within the Flood Risk Assessment, prepared by GTA Civils and Transport, sustainable drainage features will be employed to ensure the rate of surface water runoff leaving the site in the post-development context does not exceed the greenfield rate for all events up to and including the 1 in 100 year plus 40% climate change event. It is intended that surface water generated on the proposed development site will be channelled to an infiltration basin, which is to be located within the north-western corner of the site. Surface water collected within the proposed infiltration basin will then be allowed to infiltrate directly to the ground. The incorporation of the proposed infiltration pond will ensure necessary treatment of collected surface water runoff is provided to minimise the potential contamination of any groundwater underlying the site. In addition, the proposed infiltration pond has been sized to ensure all surface water generated on the site during events up to and including the 1 in 1,000 year plus 40% climate change event may be accommodated, and it has been demonstrated that, should the pond overflow, all exceedance flows will be directed to the west, away from the proposed buildings.
- 4.17 The Flood Risk Assessment concludes that, through the implementation of the surface water management strategy outlined above, the future occupants and users of the proposed development will be at low risk of flooding, and the development will not increase the risk of flooding on-site or within the surrounding area. The proposals therefore comply with the requirements of local and national planning policy with respect to flood risk.

Reducing Water Consumption

- 4.18 The majority of England is under water stress, with more water often being consumed than is available during dry weather. As the population continues to grow, and with changes to the frequency of rainfall events projected as a result of climate change, this situation will be further exacerbated, with even greater pressure exerted on the supply of potable water.
- 4.19 In order to actively mitigate against this, it is intended that water saving fittings and appliances shall be installed to target a water consumption rate of 105 litres or less per person per day, based on the DCLG water efficiency calculator for the residential elements. Full details of the water calculation are provided in Appendix A2.
- 4.20 Table 4.1 details the consumption rates associated with the water efficient fittings to be included within the dwellings, subject to changes at later detailed design stages.

Table 4.1 **Proposed water use**

Fitting	Consumption
Low volume dual flush toilets	4.5 litres (full) / 3 litres (part)

Wash hand basin tap	4.5 litres per minute
Kitchen sink tap	5 litres per minute
Bath (where fitted)	140 litres capacity (to overflow)
Shower	6 litres per minute
Washing machine	Recommended – 40 litres/use
Dishwasher	Recommended – 12 litres/cycle

Materials and Waste

- 4.21 Materials should be responsibly sourced by the main contractor, and be specified to have a low embodied impact. Materials with a low embodied impact, as defined within the BRE Green Guide to Specification, should be selected for use in the building design and construction.
- 4.22 The selection of materials is determined by a variety of factors, such as the architectural context, design rationale, embodied carbon and maintenance requirements. For the proposed development, consideration will be given to the lifecycle environmental performance with materials selected in consideration of the BRE's Green Guide to Specification, aiming for A or B rated materials wherever possible.
- 4.23 The use of locally sourced materials will be prioritised wherever possible to reduce the impacts associated with the transportation of materials. Using materials produced in the local area will also aid in developing the identity of the development, by ensuring it is in line with the local character and context. For the proposed development, there will be a focus on sustainable design, with materials selected that are in keeping with the local vernacular and landscape character, aiming for locally sourced materials where possible.
- 4.24 During detailed design of the building fabric, consideration will be given to minimising the environmental impact of materials, by selecting non-toxic and robust materials to ensure longevity and a minimal impact on the health of occupants.
- 4.25 Timber will be selected and purchased in consideration of sustainability certification. It is intended that all structural timber elements along with any timber used for temporary uses, such as scaffolding, will be sustainably sourced, e.g. from FSC and/or PEFC sources.

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- 4.26 During the construction phase, principal contractor will be required to implement a Site Waste Management Plan (SWMP), which will detail who will be responsible for resource management, which types of waste will be generated, how the waste will be managed (e.g. reduced, reused or recycled), which contractors will be used, and how the quantity of waste generated by the project will be measured.
- 4.27 To encourage a greater proportion of the operational waste to be diverted from landfill, it is proposed to provide dedicated spaces of sufficient size and convenient location for each of the new dwellings. Internal storage will be considerate of the Building Regulations, Council and other relevant requirements. Dedicated external waste storage areas for refuse and recycling will also be allocated for each dwelling, and communal waste storage facilities will be provided at the ground floor level for the proposed maisonettes and apartments.

Nature Conservation and Ecology

- 4.28 The Biodiversity Net Gain Assessment, prepared by Aspect Ecology, confirms that the site is currently dominated by grassland fields formerly used as pasture, which are relatively unmanaged in nature and partially bound by hedgerows. In addition, a number of other habitats are present including areas of ruderal vegetation and hardstanding.
- 4.29 The semi-improved grassland that dominates the site has been designated as being in 'Poor' condition, due to the fact that there are less than six species present per sqm and due to the presence of a number of invasive species. There is one area of scrub present adjacent to Maidstone Road along the south-east boundary of the site. This area comprises loose scattered trees and scrub along a wide ditch line, and has been designated as being in 'Moderate' condition. It is intended that the vast majority of the scrub will be retained with the exception of a small area, the removal of which is required to create the proposed site entrance on the south-east boundary.
- 4.30 As part of the proposed Landscape Strategy, prepared by FPCR Environment and Design Ltd and displayed in Figure 4.3 below, the following will be incorporated as part of the proposed development:
- Existing grassland will be retained along the northern boundary as part of the proposed Ancient Woodland Buffer Zone and will be enhanced to other neutral grassland, which will include wildflower planting. It is anticipated that this habitat will support a reasonable species diversity and structure, in particular the section of this area that is to also be planted with a tussocky mixture to provide suitable grassland habitats for reptiles.
 - Part of the existing grassland within the Ancient Woodland Buffer Zone along the northern boundary will be retained, and planted with a wide range of native woody species planting. This new scrub planting will also form a light barrier for the Ancient Woodland which is situated beyond

the site. This area will be an important source of nectar, fruits and seed; as well as providing breeding and roosting sites for birds and other faunal species.

- Additional scrub planting will be incorporated extensively along the western boundary associated with the proposed infiltration pond, and along the south-eastern boundary of the site.
- Areas of amenity grassland will be created near to the built development and within recreational areas such as the play area and picnic area.
- Areas of introduced shrub, which will include resilient urban plant species, will be incorporated to surround the proposed houses and frontages within the main development complex.
- A total of 41 Silver Birch and 57 smaller native trees are proposed to be incorporated throughout the public open space and streetscape.
- A total of 891m of native hedgerow planting is proposed, with additional ornamental hedgerow planting to be incorporated around property curtilages.

Figure 4.3 Illustrative landscape strategy



- 4.31 The Biodiversity Net Gain Assessment concludes that, through the implementation of the Landscape Strategy displayed above, the proposed development will deliver a 42.69% biodiversity net gain with respect to habitat units and a 100% gain with respect to hedgerow units. This is in exceedance of the minimum 10% Biodiversity Net Gain that is to be required under the Environment Act, and the emerging local requirement to achieve a 20% improvement.

Tackling the Effects of Climate Change

4.32 In order to protect the development against overheating in the future, a number of key design features have been proposed to ensure the proposals are resilient to increased temperatures, which may be experienced as a result of climate change. The following measures are deemed to contribute to the mitigation of the effects of climate change:

- The landscape design will include trees and vegetation to help regulate the microclimate on-site and reduce the risk of internal overheating within the development.
- The dwellings' facades will have a balanced amount of glazing to mitigate direct solar heat gain whilst optimising daylight penetration.
- Openable windows on multiple aspect spaces will be integrated to provide a passive ventilation strategy that utilises crossflow ventilation to maximise the potential for natural ventilation within the dwellings.
- Internal heat gains will be minimised through the use of energy efficient lighting and equipment, the employment of air source heat pump (ASHP) technology, and the insulation of hot water distribution pipework to prevent heat loss into the dwelling spaces.

Pollution

Land Contamination

4.33 The Geo-Environmental & Geotechnical Assessment (Ground Investigation) Report, prepared by Jomas Engineering Environmental confirms that the site currently comprises undeveloped open grassland. The site has remained largely undeveloped, and has historically been used predominantly as farmland. The underlying geology is expected to comprise Seaford Chalk Formation within the bedrock, overlain by superficial drift deposits of Clay with Flints Formation. The underlying bedrock has been classified as a Principal aquifer. The site lies within a Zone 3 (Total Catchment) Source Protection Zone (SPZ) and is related to three groundwater and potable water abstraction licences situated within 1km of the site. Conceptual site modelling undertaken for the site indicates that the risks to the health of the general public, future residents, construction workers, controlled waters and buildings and structures associated with all identified potential sources are low. Based on this, and following the land contamination assessment, no further assessment or risk mitigation is required, and the site can be considered suitable for the proposed use.

Noise

4.34 The Noise Assessment, prepared by WSP, confirms that the design of the proposed scheme has been informed by good acoustic design to ensure that the positioning and orientation of the dwellings have been optimised to minimise the levels of noise experienced by future residents.

4.35 Modelling undertaken as part of the Noise Assessment indicates that, when considering distance from road noise sources, the dwellings not overlooking Hoath Way and Maidstone Road will achieve the recommended levels of internal noise with windows partially open. For dwellings that do overlook these roads, it is demonstrated that the recommended levels of internal noise will be achieved should windows be kept closed. It is therefore noted that sufficient ventilation will be required where the construction of a façade will rely on closed windows to achieve the criteria, and it therefore required at the properties that overlook Hoath Way and Maidstone Road. The assessment indicates that a standard glazing and vents will be sufficient to achieve the required noise levels for the majority of the proposed dwellings, with additional façade mitigation, including the use of glazing with enhanced acoustic performance and intermittent extract ventilation, being provided for those dwellings identified as potentially experiencing elevated levels of noise.

4.36 The Assessment also considered noise levels within the proposed amenity spaces, with the vast majority of the garden spaces demonstrated to experience levels of noise that are in compliance with BS:8233, and the relevant World Health Organisation (WHO) criteria. Further to this, the impact of the proposed air source heat pump (ASHP) systems on noise levels was considered. The results of the Assessment indicate that the employment of these systems will not result in an adverse impact on future residents.

Water

4.37 The implementation of the proposed sustainable drainage system (SuDS), outlined in the Flood Risk Assessment prepared by GTA Civils and Transport, will include appropriate pollution control measures to minimise the risk of pollution entering the ground from surface water runoff from the development. An appropriate SuDS treatment train, consisting of an infiltration pond, has been incorporated within the design to treat surface water before it is discharged to the underlying ground.

4.38 Additional measures will also be adopted during construction to minimise the risk of ground and surface water pollution, including:

- Oil separators;
- Clear marking and signage of drainage stems;
- Any on-site fuel or oil delivery areas will be fully bunded;
- Areas for cleaning activities will also be bunded; and
- Best practice measures, implemented as part of a Construction Environmental Management Plan (CEMP), to mitigate the impacts of construction-related dust and emissions.

5. ENERGY STRATEGY

- 5.1 With reference to the policy requirements, guidance and industry best practice detailed in Section 3, a comprehensive energy and carbon dioxide (CO₂) emissions assessment has been carried out for the proposed development. The energy performance of the scheme has been analysed and evaluated against the most up-to-date iteration of Part L of the Building Regulations and pertinent Medway Council policies, accounting for economic, technical and functional feasibility.
- 5.2 In order to maintain a degree of flexibility in meeting the national standards set out in the Building Regulations on carbon and energy performance, as required by Medway Council, the measures outlined below describe a potential means of achieving a reduction in CO₂ emissions over the Part L:2021 baseline. Therefore, the final building specification may be subject to change during subsequent design.
- 5.3 The proposed energy strategy is based upon the principles of the Energy Hierarchy on the basis that it is preferable to reduce carbon dioxide emissions through reduced energy consumption above decarbonisation through alternative energy sources.
- 5.4 The tiers of the Energy Hierarchy are:
- Be Lean Use less energy
 - Be Clean Supply energy efficiently
 - Be Green Use renewable energy

Figure 5.1 The Energy Hierarchy



‘Be Lean’ (Use Less Energy)

- 5.5 Within the first stage of the energy hierarchy, it is proposed to incorporate high levels of passive and energy efficient design measures in order to reduce the development’s energy consumption and associated CO₂ emissions, utilising a ‘fabric first’ approach to reduce energy demand.
- 5.6 Details of the passive design and energy efficiency measures proposed have been detailed below.
- 5.7 Passive design utilises daylight, solar energy, shading and stack or wind driven ventilation to illuminate, heat, shade where necessary and ventilate/cool the building, thus requiring less (mechanical) energy to achieve the performance standards for health and wellbeing of the residents.
- 5.8 Site characteristics relating to local climate, surroundings, scale and size of the development therefore passively influence the potential energy requirement and savings that can be achieved through the consideration of these aspects. The parameters that most influence the potential to utilise sunlight and solar gains are the orientation and layout of buildings, however these are typically driven by various factors other than energy efficiency or bioclimatic design considerations (e.g. aesthetics, function, etc.).
- 5.9 As shown in Figure 2.2, the orientation of the dwellings will be dictated by the plot orientation in order to give the overall scheme a cohesive design approach. The distances between buildings have been optimised to ensure sufficient access to natural daylight and passive solar gains to the dwellings. Light and solar gain will also be influenced by the fenestration and the selection of glazing with a high degree of light transmittance.
- 5.10 The following U-values are proposed as a means of limiting heat loss through the dwelling building fabric.

Table 5.1 Proposed building fabric U-values

Building Fabric Element	Part L:2021 backstop U-values (W/m ² K)	Proposed U-values (W/m ² K)
Ground floor	0.18	0.15
Exposed floor	0.18	0.15
External wall	0.26	0.18
Garage wall	0.26	0.26
Party wall	0.20	0.00
Roof	0.16	0.11
Windows	1.60 (including frame)	1.20 (including frame)
Doors	1.60	1.30

- 5.11 The glazing will be double glazed, argon filled with a low emissivity coating. Although this has yet to be formally specified, it is expected that window U-values will be 1.20 W/m²K or better (including frame), with a g-value of 0.76 and light transmission of ~70% to improve natural daylight penetration.
- 5.12 A high level of air tightness is proposed, where a level equal to or below 5 m³/h/m² shall be targeted, meaning that air infiltration between the internal and the external environment will be largely controlled, and space heating/cooling demand further reduced.
- 5.13 The other significant means of heat loss from dwellings is due to thermal (or cold) bridging. This is typically a construction detail which has higher thermal conductivity than the surrounding materials, creating a path of least resistance for heat transfer. Thermal bridges result in an overall reduction in thermal resistance of the building elements and should be designed out where possible to minimise unwanted heat loss. In order to minimise heat loss through thermal bridges, accredited construction details have been assumed, with an equivalent ψ -value of between 0.014 – 0.028 for each dwelling.

5.14 High efficiency plant, equipment and controls are proposed to limit the energy consumed in order to provide the required level of indoor environmental performance and control. Performance efficiency values were tested and improved in energy models to benchmark the resulting predicted CO₂ reduction.

- Low energy LED lighting will be installed throughout the residential units.
- Residential units will be provided with opening windows to mitigate against overheating and to provide fresh air.
- Energy management systems, such as smart meters, will be installed in all dwellings to enable future residents to monitor their energy usage, and therefore aid in reducing their energy consumption.
- All future residents will be provided with a Home User Guide, to ensure all plant and equipment provided is used correctly and to enable efficiency of use to be maximised.
- Heating within individual dwellings will be controlled via the use time and temperature zone controls.

‘Be Clean’ (Supply Energy Efficiency)

5.15 The potential for the proposed development to incorporate a low carbon heating system has been reviewed for the scheme.

5.16 Local heat and power sources minimise distribution losses and achieve greater efficiencies when compared to a separate energy system. This in turn reduces the site-wide energy consumption and associated carbon dioxide emissions.

5.17 The potential integration of a district heating network or a conventional gas-fired combined heat and power (CHP) plant to provide low carbon heat and power on-site has been evaluated for the development, in compliance with industry best practice and appropriate planning policies.

District Heating Feasibility

5.18 The feasibility of a district heating network is heavily dependent on a location’s heat demand. In turn, heat demand in the locality is dependent on building usage and the surrounding area heat demand density.

5.19 Figure 5.2 below displays the development site within its proposed surroundings. From this, it can be concluded that the site itself is undeveloped, though it is located at the southern edge of the existing settlement of Hempstead. The wider surrounding area is formed predominantly of open fields

and low-density residential dwellings, and is therefore likely to be characterised by a low heat demand.

- 5.20 There are no existing or proposed district heating networks within close proximity to the development site. In addition, due to the relatively low density of the development and the cost of the infrastructure required to connect a rural location to a district heat network, it is not deemed cost effective to establish a district heat network on the site.

Figure 5.2 Site and Surroundings

 Approximate site boundary



- 5.21 Based on the anticipated timescale of the proposed development and the predicted trajectory of the national electricity grid decarbonisation, the development of a combined heat and power (CHP) network powered by fossil fuels is not considered to be the most carbon efficient approach.
- 5.22 The incorporation of a gas-fired CHP network will lock the development into relatively carbon intensive gas-fired heating and hot water technology, and will not facilitate the transition to less carbon intensive solutions.
- 5.23 Based on this, it is proposed that air source heat pump (ASHP) systems will be employed to service the development. The incorporation of this technology is discussed in greater detail in the 'Be Green' section below.

‘Be Green’ (Utilise Renewable Technologies)

- 5.24 The proposed development has given consideration to renewable energy technologies that may be applicable to deliver the required level of carbon dioxide savings over the Part L:2021 baseline, and the likely local effects on the environment.
- 5.25 In determining the appropriate renewable technology for the site, a number of factors including carbon dioxide savings, site constraints, and potential visual impacts have been considered. Further details of each technology and its associated assessment in relation to the development are provided below.
- **Biomass** – This technology is not considered a practical solution for reducing carbon dioxide emissions, in the view of limited options available for domestic scale installations, storage space requirements for the combustible material, and the transport related carbon emissions which are not normally accounted for within energy modelling. Furthermore, high nitrous oxide (NO_x) and particulate matter (PM_x) emissions are associated with the use of biomass fuel, and as the proposed development will form part of a wider urban settlement, permitted emissions will be restricted.
 - **Air Source Heat Pumps (ASHP)** – Given the site location and the lack of local existing or proposed heat networks, it is proposed that air source heat pump (ASHP) technology is incorporated within the development. The implementation of these systems is supported by the government, as detailed within the Net Zero Strategy (October 2021) and the Future Homes Standard 2025 (March 2019). It is proposed that highly efficient, individual ASHP systems are installed to serve both the space and water heating demands of the proposed dwellings. Typical manufacturing specifications for the proposed systems quote a heating coefficient of 4.76, and a hot water coefficient of performance of 3.20.
 - **Ground Source Heat Pumps (GSHP)** – Due to the nature of the proposed wider development to which this phase will contribute, the site is not suitable for a horizontal ground collection loop. Furthermore, ground investigation and borehole drilling are likely to be cost prohibitive and may not yield a suitable energy source. In addition to this, the carbon dioxide and energy cost savings arising from the use of this technology are unlikely to be significant, particularly as high-grade heat is required to generate domestic hot water. The use of ground source heat pumps for the proposed development is therefore not considered viable, and it is intended that air source heat pump (ASHP) technology will be employed instead.
 - **Photovoltaics (PV)** – Whilst the employment of this technology within the proposed development is technically feasible, for the purposes of this strategy, it has been rejected. This is because the proposed ‘fabric first’ approach and intended employment of air source heat pump (ASHP) technology to serve the space and water heating demands of the dwellings will enable

the scheme to achieve the carbon dioxide emissions reductions over Part L of the Building Regulations required by Medway Council, without the need for additional electricity generation.

- **Solar Thermal Hot Water (STHW)** – This technology is presently rejected as domestic hot water is proposed to be provided by individual air source heat pumps (ASHP). In addition to this, hot water demand is considered to be outside the energy generating period for the solar thermal panels, meaning its ability to significantly reduce carbon emissions during operation is limited.
- **Wind Turbines** – This technology is rejected on the basis of its potential impact on visual amenity and relatively low efficiency from unpredictable, turbulent wind conditions associated with urban locations.

Energy Assessment Results

5.26 Energy modelling of the proposed scheme has been undertaken using the Standard Assessment Procedure (SAP) for six of the proposed dwellings. The locations of these dwellings are shown in the image below, with further details given in Table 5.2.

Figure 5.3 Sample dwellings modelled



Table 5.2 Sample dwellings modelled

Dwelling Reference	Plot Number	Dwelling Type	Aspect
--------------------	-------------	---------------	--------

Henley	1	4-bed house	NE, SE, SW, NW
Letchworth	38	2-bed house	SE, SW, NW
Stratford	48	3-bed house	NE, SE, SW, NW
Cambridge	58	3-bed house	N, E, S, W
Hampstead	69	5-bed house	NE, SE, SW, NW
Oxford	81	3-bed house	NE, SE, SW, NW

5.27 The images below depict the form of the sampled dwellings.

Figure 5.4 Proposed Henley type dwelling



Figure 5.5 Proposed Letchworth type dwelling



Figure 5.6 Proposed Stratford type dwelling



Front Elevation



Rear Elevation

Figure 5.7 Proposed Cambridge type dwelling



Front Elevation



Rear Elevation

Figure 5.8 Proposed Hampstead type dwelling



Front Elevation



Rear Elevation

Figure 5.9 Proposed Oxford type dwelling



5.28 The carbon dioxide emissions for the sampled dwellings are shown below. Building Regulations England Part L (BREL) Compliance Reports showing the performances of the modelled dwellings are provided in Appendix A3.

Figure 5.10 Domestic regulated carbon dioxide emissions

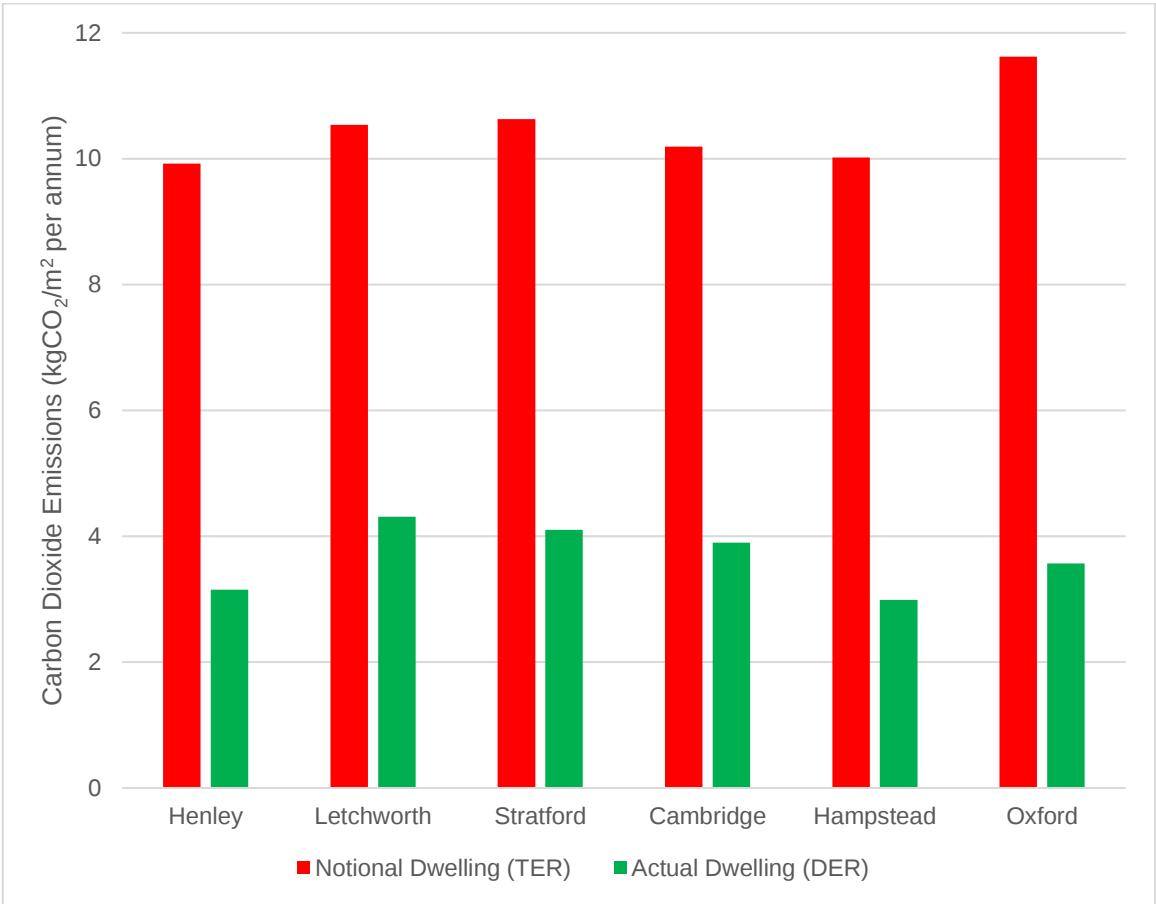


Table 5.3 Domestic regulated carbon dioxide emissions

Dwelling Reference	TER: Baseline: Part L Emissions (kgCO₂/m² per annum)	DER: Dwelling Emissions (kgCO₂/m² per annum)	Proposed Emissions Savings (kgCO₂/m² per annum)	Emissions Savings (%)
Henley	9.9	3.2	6.7	68.3%
Letchworth	10.5	4.3	6.2	59.1%
Stratford	10.6	4.1	6.5	61.4%
Cambridge	10.1	3.9	6.3	61.7%
Hampstead	10.0	3.0	7.0	70.2%
Oxford	11.6	3.6	8.0	69.3%

- 5.29 The above analysis shows that the proposed dwellings will achieve an approximate onsite carbon dioxide emissions saving of 59.1% through energy efficiency measures and renewable technologies over the Part L:2021 baseline. It should be noted that compliance with Part L:2021 of the Building Regulations is equivalent to a 31% reduction over the Part L:2013 baseline. The proposed development therefore delivers carbon dioxide emissions reductions that exceed the minimum requirements of Medway Council.
- 5.30 As the tested dwellings provide a representative sample the proposed development, it is expected that the savings presented within this assessment may be scaled across the development. This is in compliance with the requirements set out within the Medway Council policies.

6. SUMMARY

- 6.1 This Climate Change and Energy Efficiency Statement provides an overview as to how the proposed development at Blowers Wood, Hempstead contributes to sustainable development in the context of the strategic, design and construction considerations.
- 6.2 Consideration has been given to the Medway Local Plan in the formulation of this statement. The overall development has been assessed using the guidance outlined in Local Plan Policies BNE1 (General Principles for Built Development), BNE4 (Energy Efficiency) and BNE22 (Environmental Enhancement), providing a holistic sustainability approach for the proposals.
- 6.3 By designing to rigorous energy standards, and employing air source heat pump (ASHP) technology, the application will respond directly to the Climate Emergency declared by the Council in April 2019. These measures combine to provide an approximate carbon dioxide emissions saving of 59.1%, compared to the Part L:2021 baseline, significantly exceeding the requirements of Medway Council.
- 6.4 Sections 4 and 5 of this statement demonstrate that the siting and design of the proposals support relevant policies relating to sustainable development. This shows that the proposed development:
- will make efficient use of land;
 - will mitigate the risk of surface water flooding through the employment of a surface water drainage strategy;
 - will minimise internal water consumption to 105 litres per person per day;
 - will incorporate low-impact materials, according to the BRE Green Guide to Specification;
 - will minimise waste production during construction and maximise the proportion of waste to be diverted from landfill;
 - will incorporate measures to improve site biodiversity, including native hedgerow and tree planting;
 - will ensure land, noise and water pollution are minimised as far as possible;
 - will minimise energy demand through the specification of low U-values, low air permeability and low thermal bridging to reduce heat loss;
 - will be fossil fuel free, utilising air source heat pump (ASHP) technology to serve the space and water heating demands of the proposed dwellings; and

-
- will achieve an approximate 59.1% reduction in CO₂ emissions, following the Energy Hierarchy methodology.

6.5 Overall, the proposals for the scheme are in line with the principles of sustainable development as well as the policy requirements of the NPPF and the Medway Council, and will provide a development that promotes these principles in operation.

A1. SITE PLAN



ACCOMMODATION SCHEDULE MIX

House Name	Beds	Area (sqft)	No.	Total Area (sqft)
Maisonette GF	1 Bed	552	3	1,656
Maisonette 1F	1 Bed	637	3	1,911
Hexham	2 Bed	694	2	1,388
Letchworth	2 Bed + Study	983	2	1,966
Stratford	3 Bed + Study	1211	5	6,055
Oxford LS	3 Bed	1316	9	11,844
Cambridge	3 Bed + Study	1372	8	10,976
Overton	4 Bed	1392	1	1,392
Leamington LS	3 Bed	1394	8	11,152
Harrogate	4 Bed	1555	1	1,555
Henley	4 Bed	1769	11	19,459
Hampstead	5 Bed	1850	13	24,050
Total Private Market			66	93,404
				75%

Maisonette GF	1 Bed	552	2	1,104
Maisonette 1F	1 Bed	637	2	1,274
S-1A	1 Bed	754	3	2,262
S-2A	2 Bed	757	3	2,271
S-2B	2 Bed	763	3	2,289
Dart	3 Bed	896	3	2,688
Total Affordable			16	11,888

Hexham	2 Bed	694	6	4,164
Total First Homes			6	4,164
				25%
Total			88	109,456

CAR PARKING SCHEDULE

Type	Bedrooms	House Count	Required		Provided
			Per Unit	Total	
Apartment	1	13	1	13	13
Apartment	2	6	1	6	6
House	2	8	1.5	12	13
House	3	35	2	70	70
House	4	13	2	26	26
House	5	13	2	26	26
		Total		153	154
Visitor			0.25	22	24
Total				175	178

POLICY MIX COMPARISON

Market	Bed No.	Policy Mix	Provided
Market	1 Bed	10-15%	9%
	2 Bed	25-30%	6%
	3 Bed	35-40%	45%
	4+ Bed	20-25%	40%
Affordable	1 Bed	30-35%	32%
	2 Bed	30-35%	55%
	3 Bed	25-30%	13%
	4+ Bed	5-10%	0%

NOTES

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KEY

- Application Site Boundary
- Potential Vehicular Access
- 15m Offset to Ancient Woodland
- Affordable Rented Dwelling
- First Homes Dwelling
- Market Dwelling
- Proposed Attenuation Feature
- Existing Public Right of Way (PROW)
- New Diverted PROW
- Approximate size and location of proposed foul water pumping station with 15m offset
- Approximate size and location of proposed sub-station

P22	11/01/2023	Minor road amendment.	HJL	KMN
P21	15/11/2022	Updated as per latest tracking info.	HJL	KMN
P20	01/11/2022	Minor amendments.	HJL	KMN

rev	date	description	dm	chk
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masterplanning
environmental assessment
landscape design
urban design
ecology
architecture
arboriculture

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client
Redrow Homes

project
**Blowers Wood,
Maidstone Road, Kent**

drawing title
Site Layout

scale
1:500 @ A1

dm
HJL

chk
KMN

date created
09 March 2022

project number
10745

status
S1

issue
P22

document number
10745-FPCR-ZZ-XX-DR-A-0001

A2. WATER USAGE CALCULATOR



Job no:	22-IF025
Date:	25/01/2023
Assessor name:	
Registration no:	N/A
Development name:	Land at Blowers Wood

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WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALCULATOR)

	House Type:	Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10	
	Description:	Typical Unit																			
Installation Type	Unit of measure	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day
Is a dual or single flush WC specified?		Dual		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Click to Select		Click to Select		Click to Select	
WC	Full flush volume	4.5	6.57		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Part flush volume	3	8.88		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Taps (excluding kitchen and external taps)	Flow rate (litres / minute)	4.5	8.69		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Are both a Bath & Shower Present?		Bath & Shower		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Bath	Capacity to overflow	140	15.40		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Shower	Flow rate (litres / minute)	6	26.22		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Kitchen sink taps	Flow rate (litres / minute)	5	12.56		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a washing machine been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Washing Machine	Litres / kg		17.16		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a dishwasher been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Dishwasher	Litres / place setting		4.50		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a waste disposal unit been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Water Softener	Litres / person / day		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Calculated Use		100.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Normalisation factor		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91	
Code for Sustainable Homes	Total Consumption	91.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	Mandatory level	Level 3/4		-		-		-		-		-		-		-		-		-	
Building Regulations 17.K	External use	5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0	
	Total Consumption	96.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	17.K Compliance?	Yes		-		-		-		-		-		-		-		-		-	

A3. BREL REPORTS

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Sun 22 Jan 2023 21:30:23

Project Information			
Assessed By	Test User	Building Type	House, Detached
OCDEA Registration	STRO000006	Assessment Date	2023-01-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	162 m ²
Site Reference	Henley	Plot Reference	Plot 1
Address	Land at Blowers Wood, ME7 3DT		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate

Fuel for main heating system	Electricity
Target carbon dioxide emission rate	9.92 kgCO ₂ /m ²
Dwelling carbon dioxide emission rate	3.15 kgCO ₂ /m ² OK

1b Target primary energy rate and dwelling primary energy

Target primary energy	52.08 kWh _{PE} /m ²
Dwelling primary energy	33.33 kWh _{PE} /m ² OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency

Target fabric energy efficiency	44.5 kWh/m ²
Dwelling fabric energy efficiency	43.4 kWh/m ² OK

2a Fabric U-values

Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	WalltoGarage (0.26)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.15	Floor (0.15)	OK
Roofs	0.16	0.11	ExternalRoof (0.11)	OK
Windows, doors, and roof windows	1.6	1.23	1 (1.5)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls	155.53	0.21
Exposed wall: WalltoGarage	19.74	0.26
Ground floor: Floor	82.1	0.15
Upper floor: FloorOverGarage	0.8	0.15
Exposed roof: ExternalRoof	80.01	0.11
Exposed roof: Porch	2.46	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
1, Doors	2.05	South East	0.7	1.5
2, Doors	2.05	South West	0.7	1.5
3, Windows (1)	13.44	South East	0.7	1.2
4, Windows (1)	10.01	North West	0.7	1.2
5, Windows (1)	1.31	North East	0.7	1.2
6, Windows (1)	7.62	North West	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E1: Steel lintel with perforated steel base plate	Not government-approved scheme	0.236	Not Provided
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.064	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.01 (!)	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.005 (!)	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.058	Not Provided
External wall	E20: Exposed floor (normal)	Not government-approved scheme	0.048	Not Provided
External wall	E21: Exposed floor (inverted)	Not government-approved scheme	-0.082	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	-0.002 (!)	Not Provided
External wall	E10: Eaves (insulation at ceiling level)	Not government-approved scheme	0.053	Not Provided
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.057	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.051	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.098	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	5.01 m ³ /hm ² , Design value	OK
Air permeability test certificate reference	Not Provided	

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity		
Efficiency	399.5%	
Emitter type	Underfloor	
Flow temperature		
System type		
Manufacturer		
Model		
Commissioning		
Secondary heating system: N/A		
Fuel	N/A	
Efficiency	N/A	
Commissioning		

5 Hot water

Cylinder/store - type: Cylinder		
Capacity	150 litres	
Declared heat loss	2.09 kWh/day	
Primary pipework insulated	Yes	
Manufacturer		
Model		
Commissioning		
Waste water heat recovery system 1 - type: N/A		
Efficiency		
Manufacturer		
Model		

6 Controls

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		

Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Sun 22 Jan 2023 21:30:26

Project Information			
Assessed By	Test User	Building Type	House, Semi-detached
OCDEA Registration	STRO000006	Assessment Date	2023-01-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	90 m ²
Site Reference	Letchworth	Plot Reference	Plot 38
Address	Land at Blowers Wood, ME7 3DT		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	10.54 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.31 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	54.84 kWh _{PE} /m ²		
Dwelling primary energy	46.18 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	35.9 kWh/m ²		
Dwelling fabric energy efficiency	33.9 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.21	Walls (0.21)	OK
Party walls	0.2	0	PartyWall (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.15	Floor (0.15)	OK
Roofs	0.16	0.12	Sloping (0.21)	OK
Windows, doors, and roof windows	1.6	1.18	2 (1.2)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls	74.86	0.21
Party wall: PartyWall	43.91	0 (!)
Ground floor: Floor	45.01	0.15
Exposed roof: ExternalRoof	45.3	0.11
Exposed roof: Sloping	3.28	0.21

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
1, Doors	2.05	North West	0.7	1 (!)
2, Windows (1)	6.28	North West	0.7	1.2
3, Windows (1)	3	South East	0.7	1.2
4, Windows (1)	1.54	South West	0.7	1.2
5, Windows (1)	7.62	South East	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.064	Not Provided

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Not government-approved scheme	0.01 (!)	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.005 (!)	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.058	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	-0.002 (!)	Not Provided
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.017 (!)	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.051	Not Provided
External wall	E12: Gable (insulation at ceiling level)	Not government-approved scheme	0.057	Not Provided
External wall	E13: Gable (insulation at rafter level)	Not government-approved scheme	0.04	Not Provided
External wall	E10: Eaves (insulation at ceiling level)	Not government-approved scheme	0.053	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.098	Not Provided
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.041	Not Provided
External wall	E1: Steel lintel with perforated steel base plate	Not government-approved scheme	0.236	Not Provided
Party wall	P1: Ground floor	Not government-approved scheme	0.043	Not Provided
Party wall	P4: Roof (insulation at ceiling level)	Not government-approved scheme	0.035 (!)	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	5.01 m ³ /hm ² , Design value	OK
Air permeability test certificate reference	Not Provided	

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	352.2%
Emitter type	Underfloor
Flow temperature	
System type	
Manufacturer	
Model	
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder	
Capacity	150 litres
Declared heat loss	2.09 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Sun 22 Jan 2023 21:30:27

Project Information			
Assessed By	Test User	Building Type	House, Detached
OCDEA Registration	STRO000006	Assessment Date	2023-01-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	112 m ²
Site Reference	Stratford	Plot Reference	Plot 48
Address	Land at Blowers Way, ME7 3DT		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	10.63 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.1 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	55.47 kWh _{PE} /m ²		
Dwelling primary energy	43.6 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	41.1 kWh/m ²		
Dwelling fabric energy efficiency	39.9 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.21	Walls (0.21)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.15	Floor (0.15)	OK
Roofs	0.16	0.12	Sloping (0.21)	OK
Windows, doors, and roof windows	1.6	1.19	2 (1.2)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls	127.71	0.21	
Ground floor: Floor	55.87	0.15	
Exposed roof: ExternalRoof	51.08	0.11	
Exposed roof: Sloping	5.22	0.21	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
1, Doors	2.05	North West	0.7	1.1 (!)
2, Windows (1)	10.4	North West	0.7	1.2
3, Windows (1)	5.46	South East	0.7	1.2
4, Windows (1)	0.72	South West	0.7	1.2
5, Windows (1)	8.63	South East	0.7	1.2
6, Windows (1)	1.44	North East	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E1: Steel lintel with perforated steel base plate	Not government-approved scheme	0.234	Not Provided

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.064	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.01 (!)	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.005 (!)	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.058	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	-0.002 (!)	Not Provided
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.017 (!)	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.051	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.098	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	5.01 m ³ /hm ² , Design value	OK
Air permeability test certificate reference	Not Provided	

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity		
Efficiency	363.1%	
Emitter type	Underfloor	
Flow temperature		
System type		
Manufacturer		
Model		
Commissioning		
Secondary heating system: N/A		
Fuel	N/A	
Efficiency	N/A	
Commissioning		

5 Hot water

Cylinder/store - type: Cylinder		
Capacity	150 litres	
Declared heat loss	2.09 kWh/day	
Primary pipework insulated	Yes	
Manufacturer		
Model		
Commissioning		
Waste water heat recovery system 1 - type: N/A		
Efficiency		
Manufacturer		
Model		

6 Controls

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed: Name:	Assessor ID: Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Sun 22 Jan 2023 21:30:24

Project Information			
Assessed By	Test User	Building Type	House, Detached
OCDEA Registration	STRO000006	Assessment Date	2023-01-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	128 m ²
Site Reference	Cambridge	Plot Reference	Plot 58
Address	Land at Blowers Wood, ME7 3DT		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	10.19 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	3.9 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	53.28 kWh _{PE} /m ²		
Dwelling primary energy	41.37 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	41.1 kWh/m ²		
Dwelling fabric energy efficiency	40 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.21	Walls (0.21)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.15	Floor (0.15)	OK
Roofs	0.16	0.13	Sloping (0.21)	OK
Windows, doors, and roof windows	1.6	1.23	1 (1.4)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls	134.65	0.21
Ground floor: Floor	63.9	0.15
Exposed roof: ExternalRoof	55.41	0.11
Exposed roof: Sloping	14.78	0.21

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
1, Doors	2.05	South	0.7	1.4
2, Doors	2.05	East	0.7	1.4
3, Windows (1)	9.17	South	0.7	1.2
4, Windows (1)	6.09	North	0.7	1.2
5, Windows (1)	0.72	East	0.7	1.2
6, Windows (1)	6.85	North	0.7	1.2
7, Windows (1)	0.72	West	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))	
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E1: Steel lintel with perforated steel base plate	Not government-approved scheme	0.236	Not Provided
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.064	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.01 (!)	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.005 (!)	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.058	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	-0.002 (!)	Not Provided
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.017 (!)	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.051	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.098	Not Provided
External wall	E12: Gable (insulation at ceiling level)	Not government-approved scheme	0.057	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	5.01 m ³ /hm ² , Design value	OK
Air permeability test certificate reference	Not Provided	

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	368.2%
Emitter type	Underfloor
Flow temperature	
System type	
Manufacturer	
Model	
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder	
Capacity	150 litres
Declared heat loss	2.09 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat and HW separately timed	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Sun 22 Jan 2023 21:30:30

Project Information			
Assessed By	Test User	Building Type	House, Detached
OCDEA Registration	STRO000006	Assessment Date	2023-01-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	172 m ²
Site Reference	Hampstead	Plot Reference	Plot 69
Address	Land at Blowers Wood, ME7 3DT		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	10.02 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	2.99 kgCO ₂ /m ²	OK

1b Target primary energy rate and dwelling primary energy		
Target primary energy	52.55 kWh _{PE} /m ²	
Dwelling primary energy	31.62 kWh _{PE} /m ²	OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	43.7 kWh/m ²	
Dwelling fabric energy efficiency	41.2 kWh/m ²	OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	WalltoGarage (0.26)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.15	Floor (0.15)	OK
Roofs	0.16	0.13	SlopingCeiling (0.21)	OK
Windows, doors, and roof windows	1.6	1.24	1 (1.5)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls	152.45	0.21
Exposed wall: WalltoGarage	18.29	0.26
Exposed wall: Dormer	1.74	0.2
Exposed wall: TrussWall	1.53	0.2
Ground floor: Floor	75.79	0.15
Upper floor: FloorOverGarage	19.43	0.15
Exposed roof: ExternalRoof	77.48	0.11
Exposed roof: SlopingCeiling	15.05	0.21
Exposed roof: DormerRoof	3.86	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
1, Doors	2.05	South West	0.7	1.5
2, Doors	2.05	North West	0.7	1.5
3, Windows (1)	10.03	South West	0.7	1.2
4, Windows (1)	14.97	North East	0.7	1.2
5, Windows (1)	0.62	South East	0.7	1.2
6, Windows (1)	2.12	South West	0.7	1.2
7, Windows (1)	1.31	North West	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.046	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.005 (!)	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.006 (!)	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.058	Not Provided
External wall	E20: Exposed floor (normal)	Not government-approved scheme	0.046	Not Provided
External wall	E21: Exposed floor (inverted)	Not government-approved scheme	-0.066	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	-0.001 (!)	Not Provided
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.026 (!)	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.044	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.084	Not Provided
External wall	E12: Gable (insulation at ceiling level)	Not government-approved scheme	0.06	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))		
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	5.01 m ³ /hm ² , Design value	OK
Air permeability test certificate reference	Not Provided	

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	399.5%
Emitter type	Underfloor
Flow temperature	
System type	
Manufacturer	
Model	
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	150 litres
Declared heat loss	2.09 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	

Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Sun 22 Jan 2023 21:30:29

Project Information			
Assessed By	Test User	Building Type	House, Detached
OCDEA Registration	STRO000006	Assessment Date	2023-01-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	121 m ²
Site Reference	Oxford	Plot Reference	Plot 81
Address	Land at Blowers Wood, ME7 3DT		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	11.62 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	3.57 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	60.8 kWh _{PE} /m ²		
Dwelling primary energy	38.03 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	45.3 kWh/m ²		
Dwelling fabric energy efficiency	43.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	WalltoGarage (0.26)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.15	Floor (0.15)	OK
Roofs	0.16	0.11	ExternalRoof (0.11)	OK
Windows, doors, and roof windows	1.6	1.23	1 (1.4)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls	125.68	0.21
Exposed wall: WalltoGarage	19.16	0.26
Ground floor: Floor	53.34	0.15
Upper floor: FloorOverGarage	12.81	0.15
Exposed roof: ExternalRoof	67.18	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
1, Doors	2.25	North West	0.7	1.4
2, Doors	2.25	South East	0.7	1.4
3, Windows (1)	11.77	North West	0.7	1.2
4, Windows (1)	4.31	South East	0.7	1.2
5, Windows (1)	0.72	South West	0.7	1.2
6, Windows (1)	8.63	South East	0.7	1.2
7, Windows (1)	0.82	North East	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))	
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E1: Steel lintel with perforated steel base plate	Not government-approved scheme	0.281	Not Provided
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.064	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.022 (!)	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.018 (!)	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.058	Not Provided
External wall	E20: Exposed floor (normal)	Not government-approved scheme	0.047	Not Provided
External wall	E21: Exposed floor (inverted)	Not government-approved scheme	-0.066	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	-0.001 (!)	Not Provided
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.026 (!)	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.044	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.084	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))			
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²		
Dwelling air permeability at 50Pa	5.01 m ³ /hm ² , Design value		OK
Air permeability test certificate reference	Not Provided		

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	369.9%
Emitter type	Underfloor
Flow temperature	
System type	
Manufacturer	
Model	
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	150 litres
Declared heat loss	1.86 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat and HW separately timed	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

A4. GENERAL NOTES

- A4.1 The report is based on information available at the time of the writing and discussions with the client during any project meetings. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by Iceni Projects Ltd for inaccuracies in the data supplied by any other party.
- A4.2 The review of planning policy and other requirements does not constitute a detailed review. Its purpose is as a guide to provide the context for the development and to determine the likely requirements of the Local Authority.
- A4.3 No site visits have been carried out, unless otherwise specified.
- A4.4 This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in guidance may necessitate a re-interpretation of the report in whole or in part after its original submission.
- A4.5 The copyright in the written materials shall remain the property of Iceni Projects Ltd but with a royalty free perpetual licence to the client deemed to be granted on payment in full to Iceni Projects Ltd by the client of the outstanding amounts
- A4.6 The report is provided for sole use by the client and is confidential to them and their professional advisors. No responsibility whatsoever for the contents of the report will be accepted to any person other than the client, unless otherwise agreed.
- A4.7 These terms apply in addition to the Iceni Projects Ltd "Standard Terms of Business" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Business the said Standard Terms of Business shall prevail.). In the absence of such a written contract the Standard Terms of Business will apply.