

Sustainability Statement

Land at Cowplain Community School, Waterloooville

August 2022



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Client

Frontier Estates Ltd.

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1. Introduction

This Sustainability Statement has been prepared to demonstrate the sustainability credentials of the development proposals for the Land at Cowplain Community School, Waterlooville.

1.1 Introduction

This Sustainability Statement has been prepared by Turley Sustainability, on behalf of Frontier Estates Limited (the applicant), to support a full planning application to Havant Borough Council for the development of a new care home and six dwellings.

It provides a summary of the sustainable design measures incorporated into the proposals to ensure suitable levels of sustainability performance in accordance with local and national planning policy.

1.2 Site Context

The development site is located within the centre of Waterlooville, Hampshire, approximately 6 miles north east of Portsmouth. The site sits centrally within the town, on Hart Plain Avenue, adjacent to the Cowplain school to the east and Hart Plain Infant School to the west. It is positioned within a wider residential area bounded by Milton Road and London Road.

The development site is 1.8 acres in total and is located within the existing Cowplain Community School boundary and split into two distinct plots. Plot 1, on which the care home is proposed,

consists of c.1.3 acres of land formally part of the School's playing fields. Plot 2, for the residential dwellings, is c.0.5 acres of former tennis court which have been used as a car park in more recent years. The plots are bordered to the north by Hart Plain Avenue and separated by a small cluster of residential dwellings. The site is currently vacant.

1.3 Proposed Development

The proposed development comprises the erection of a care home (within Use Class C2) and six dwellings (within Use Class C3) with associated works including access, parking and landscaping. Development description;

'Erection of a care home (Use Class C2) and 6 dwellings (Use Class C3), parking, access, landscaping and other associated works'.

Figure 1 overleaf shows the site plan of the proposed development.

1.4 Document Structure

Chapter 2 of this report provides an overview of relevant national and local legislation, planning policy and guidance.

Chapter 3 provides detail of the sustainability and energy strategy of the proposed development, in line with local Planning Policy.

Chapter 4 provides an overview of the BREEAM Strategy for the care home element of the scheme, and sustainability measures are concluded in **Chapter 5**.

Please note, the terms "carbon", carbon dioxide (CO₂)" and "greenhouse gas (GHG)" are used interchangeably in this statement depending on the terminology of referenced documents.

Figure 1: Site Plan (Source: Design and Access Statement)



2. Policy Context

This chapter provides an overview of the relevant sustainability planning policy and guidance from a national and local perspective.

2.1 National Policy

This section sets out a summary of current national guidance and policy in relation to sustainable development.

2.1.1 National Planning Policy Framework

The National Planning Policy Framework¹ (NPPF) provides a framework for the development of locally-prepared plans and the government's planning policies for England and how these are expected to be applied.

Paragraph 7 of the NPPF states that: 'the purpose of the planning system is to contribute to the achievement of sustainable development'.

It states clearly that in order to deliver sustainable development, the planning system must perform three distinct objectives, aligned to the three pillars of sustainability, which must not be taken in isolation and should be pursued jointly:



An **economic** objective to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and

coordinating the provision of infrastructure.



A **social** objective supporting strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and



An **environmental** objective contributing to protecting and enhancing our natural, built and historic environment; including, making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

These objectives are key to the development of plans and the NPPF sets out a number of key themes for consideration which guide the preparation of local plans and policies, ensuring the delivery of sustainable development.

The July 2021 update to the NPPF recognises the role planning has to play in support of the UK's pursuit of the United Nations Sustainable Development Goals (UNSDGs) which address social progress, economic wellbeing and environmental protection². Example UNSDGs are presented in **Figure 2**.

¹ [UK Government | NPPF](#)

² [UN Sustainable Development Goals](#)

Figure 2: Example UN Sustainable Development Goals



2.1.2 Planning Practice Guidance

Planning Practice Guidance (PPG) provides further advice on various planning issues associated with development, including those linked to sustainability and renewable energy and underpins the policies within the NPPF.

PPG is a material consideration in planning decisions and should generally be followed unless there are clear reasons not to. It sets out how local authorities should include policies that protect the local environment and strategies to mitigate and adapt to climate change and supports developments that are functional and adaptable for the future.

The March 2019 PPG update confirms that Local Authorities have the option to set technical requirements exceeding the minimum requirements of the Building Regulations in respect of access, water and space where sufficient evidence is produced to justify the target.

2.1.3 National Design Guide

The National Design Guide published in October 2019 and is based on the national planning policy practice guidance and objective for good design as set out in the NPPF. The Guide introduces ten characteristics of well-designed places which work together to create developments Character and

Community, while positively addressing environmental issues affecting climate.

2.1.4 Building Regulations

Whilst not planning policy, the Building Regulations (and specifically Approved Document Part L: Conservation of Fuel and Power) set out the requirements for energy and carbon performance in new buildings.

Periodic updates to these national regulations will drive energy efficiency and carbon reduction improvements. Government has stated that developers will continue to have flexibility in how they meet carbon reduction targets; but that the emphasis is on using a “fabric first” approach.

On 15th June 2022, the Building Regulations were updated as an interim step towards part of the roadmap to the ‘full’ Future Homes and Buildings Standard, which comes into effect in 2025. The regulations aim to deliver buildings that are of a higher quality, with lower energy bills and reduce GHG emissions by around 30% for new homes and 27% for non-domestic buildings. There is a transition period of one year from this date; this will allow any new building, where plans have been submitted before 15th June, one year to make a meaningful start and be allowed to comply with the previous regulations. These transitions apply at a plot level, not at a site level.

In addition, the UK government has announced two new Building Regulations also due to take effect in June 2022, Part S and Part O. As of 15th June 2022, these standards are now in place.

New approved document Part S sets out guidance for electric vehicle (EV) charging infrastructure and specifies that EV charge points must be provided for each dwelling (or where the total number of parking spaces is less than each dwelling, all spaces should be provided with an active EV charging point). Any remaining spaces must have cable routes for charge points to be installed. For non-residential car parks with more than 10 spaces, at least one active EV charge point must be provided, with cabling to the remaining 20% of spaces.

Part O sets out new requirements for mitigating

overheating, specifying that residential developments must limit unwanted solar gains in the summer and provide means to remove heat. Compliance with Part O can be demonstrated using two methods to demonstrate the risk of overheating from rising summer temperatures has been mitigated:

- Following a simplified prescribed glazing and free area ratio; or,
- Use of a Dynamic Simulation Modelling.

2.2 Local Planning Policy

2.2.1 Hampshire County Council Climate Emergency

Hampshire County Council declared a climate emergency in 2019 with the ambition to become carbon neutral by 2050 alongside preparing to be resilient to the impacts of a 2°C temperature rise. The Hampshire Climate Change Strategy 2020 – 2025³ sets out the Council's approach which includes embedding climate resilience and mitigation across key policies and sectors.

2.2.2 Havant Borough Core Strategy 2011-2026

The adopted Local Plan, which is comprised of the Core Strategy (2011) and Site Allocations Plan (2014) sets out the 2026 vision for Havant Borough to be sustainable, innovative and have high quality design developments. The Council aim to deliver this strategic vision by seeking an appropriate balance between protecting the natural and built environment; delivering new economic growth and community regeneration; meeting the social needs of our communities and the prudent use of natural resources. This is embedded into the following strategic policy objectives:

Policy CS9 Housing – Planning permission will be granted for housing proposals that provide accommodation for the ageing population in sustainable locations.

Policy CS13 Green Infrastructure – Development will be permitted that maintains and manages the network of green infrastructure and incorporate improvements through restoration, enhancement or creation of additional resources. 'Allowable Solutions' may be used to achieve higher levels of carbon reduction where on-site proposals are not feasible or viable.

Policy CS14 Efficient Use of Resources – Planning permission will be granted for development that meets the for BREEAM 'very good' standard for multi-occupation homes and non-residential development over 500m². Improvements to this standard are encouraged throughout the plan period. Particular attention should be paid to water efficiency measures.

Policy CS15 Flood and Erosion Risk – New site drainage systems are designed taking into account of events which exceed the normal design standard. All developments will ensure that there is no net increase in surface water runoff, where priority is given to Sustainable Drainage Systems (SuDS).

Policy CS16 High Quality Design – Planning permission will be granted for development that is designed to a high standard, whereby development should demonstrate the following with respect to sustainability:

- Mitigate negative environmental impacts through sustainable design and construction methods, resource efficiencies, particularly water and the provision of facilities for waste recycling; and
- Adapts to the changing needs of the users and the changing climate over the lifespan of the building.

Policy CS20 Transport and Access Strategy – Development will be permitted that promotes better use of existing transport networks, and maintains or improves the range of transport

³ <https://documents.hants.gov.uk/climate-change/Hampshire-Climate-Change-Strategy-2020-2025.pdf>

modes accessible to the users of the development site with specific emphasis on walking and cycling where appropriate, and public transport, especially high quality/frequency buses.

Policy DM7 Elderly and Specialist Housing Provision

– Within the defined urban areas of development specific to the requirements of the elderly, people with disabilities or other forms of specialised supported housing provision will only be permitted provided that it is demonstrated that appropriate levels of on-site amenity space are accessible for residents' use which provides a satisfactory outlook for all residents.

Policy DM11 Planning for More Sustainable Travel

– The council will seek to ensure that every opportunity is taken to increase integration of sustainable travel modes.

Policy DM12 Mitigating the Impacts of Travel –

New developments will be required to mitigate the travel impact of the development, including the environmental impacts of travel such as noise, air and visual pollution, and the impacts on amenity, health and climate change.

2.2.3 Havant Borough Emerging Local Plan

The Havant Borough Emerging Local Plan was submitted for examination in February 2021. However, following consideration, the government inspectors suggested that the plan be withdrawn and a new plan created. Whilst the new plan is under development, the Havant Borough Core Strategy noted above should be used.

2.2.4 Validation Checklist⁴

Sustainability Statement – Policy CS14 of the Local Plan (Core Strategy) advises that on completion, unless proven to be financially or technically unviable, non-residential over 500 square metres should meet the BREEAM 'Very Good' standard, together with a Sustainability Statement setting out the development's approach to sustainable design.

2.2.5 Supplementary Planning Documents (SPD)

Borough Design Guide SPD – This SPD supplements Policy CS16 of the Havant Borough Core Strategy and aims to raise the standard of design across the borough. It includes a number of key principles of good design. Those relevant to this application include:

Principle 7 Adaptability and Sustainability – New places should be designed so they can adapt over time to changing circumstances, like ageing residents and climate change, and are built sustainably through construction techniques and the inclusion of energy and water efficiency measures.

2.3 Planning Policy Summary

Both local and national policy aims to ensure the delivery of sustainable and well-designed homes and other buildings which mitigate and adapt to the impacts of climate change.

The Havant Borough Core Strategy seeks to ensure the efficiency use of resources and high-quality design, demonstrated by achieving a 'very good' BREEAM rating for developments of this type.

Latest national planning policy and guidance confirms the Government's approach to sustainable development is being driven through the updates to the Building Regulations to ensure that new buildings are well designed and reduce emissions in line with the UK's national carbon targets.

The following sections of this Sustainability Statement set out the sustainability measures incorporated into the design of the development to ensure the delivery of a sustainable development and address the requirements of local policy.

⁴ [Review of the Local Information Requirements – Spring 2013 \(havant.gov.uk\)](https://www.havant.gov.uk/review-of-the-local-information-requirements-spring-2013)

3. Sustainability at Land at Cowplain Community School

This section summarises the sustainability strategy for the proposed development at the Land at Cowplain Community School.

This section of the report outlines the sustainability strategy for the proposed development at Land at Cowplain Community School, demonstrating how the development responds to both national and local planning policy, including the NPPF.

In this context the sustainable design measures incorporated into the development masterplan and design of homes at this stage are set out under the following headings which reflect the themes of the NPPF.

3.1 Building a Strong and Competitive Economy

3.2 Promoting Sustainable Transport

3.3 Delivering a Wide Choice of High-Quality Homes

3.4 Requiring Good Design

3.5 Promoting Healthy Communities

3.6 Meeting the Challenge of Climate Change

3.7 Conserving and Enhancing the Natural Environment

3.8 Sustainable Waste Management

3.1 Building a Strong and Competitive Economy

The proposed development will contribute to positive economic growth for the District through construction and occupation of the proposed sustainable new homes, supporting the aims of the NPPF.

Construction – The economic benefits of construction are well known with considerable direct and indirect positive impacts resulting from new residential construction.

A study by the Confederation of British Industries (CBI) in February 2020⁵ demonstrates that construction projects have a significant benefit on the local and wider economy. The report concludes that for every £1 of construction expenditure £2.92 is injected into the economy.

The construction of a 64-bed care home and six new dwellings will therefore provide opportunities for local employment as well as increased revenue locally for materials, services and goods.

Occupation – Further positive economic impacts of the proposed development resulting from the occupation of new homes and associated increase in local population are noted as follows;

- The construction of a 64-bed care home and six new dwellings will increase the population resulting in local benefits through the demand for goods and services;
- The increase in local population will also help support local facilities, groups and

⁵ <https://www.cbi.org.uk/media/4121/fine-margins-february-2020-cbi.pdf>

stores helping promote the vitality of the local area and beyond.

3.2 Promoting Sustainable Transport

A Transport Assessment has been prepared by Royal HaskoningDHV (referred to hereafter as 'RHDHV'), summarising the existing conditions in the vicinity of the site, the accessibility of the site relative to local facilities and services and outlines the development proposal for the site. A Travel Plan has also been produced for the care home element of the scheme.

The area surrounding the site comprises predominantly residential land use. The site is located approximately 500 metres to the west of the Queen's Inclosure wood, with Jubilee Park and WaterlooVille retail park located to the south.

Local Services and Amenities – A summary of the local facilities within a reasonable walking distance (within 2km) is provided in **Table 1** below.

Table 1: Summary of Local Services and Amenities

Amenity	Name	Distance
Town Centre	Waterlooville Town Centre	1.9km
GP Surgery	Cowplain Family Practice	850m
GP Surgery	Vine Medical Group	700m
Place of Worship	Cowplain Evangelical Church	950m
Pharmacy	Pharmacy	800m
Supermarket	Lidl Supermarket	600m
Supermarket	Co-Operative Food (Milton Road)	400m
Post Office	Horndea Post Office	500m

This section of the report provides a summary of the sustainable access and transport measures available and incorporated into the development.

Walking/Cycling Services – The nearest pedestrian crossings are directly adjacent to Plot 2, approximately 40m west of the vehicular access to Cowplain School, as well as adjacent to the access to the Infant School to the west. The existing crossing points incorporate dropped kerbs and tactile paving, as well as high visibility bollards.

An existing shared cycleway/footway is present along Milton Road to the east of the site, which provides an off-carriageway route southbound Hart Plain Avenue. This route provides a connection to Jubilee Park and WaterlooVille retail park to the south. The route is part of Havant Borough Cycle Network.

Along the A3 London Road, National Cycle Network (NCN) Route 222 is present. This route is provided in the form of both a shared footway/cycleway, as well as sections of cycle infrastructure on-carriageway. This route provides direct connections to Cowplain and Horndean district centres to the north and Waterville retail park to the south. The proposed development is therefore compliant with **Policy CS16** of the Havant Borough Core Strategy, in that it is well connected to and integrates with the immediate local and wider area by linking to existing pedestrian and cycle routes.

Measures to encourage the uptake of sustainable modes of transport are noted in the Travel Plan. These include:

- The provision of cycle parking on the Care Home site, equating to 20 cycle parking spaces and an additional 10 secure cycle parking spaces in the form of five Sheffield stands. This is considered significantly in excess of the anticipated parking demand requirements;
- The allocation of 2 cycle parking spaces per residential unit, which would be provided within a garage, which is

considered acceptable as a form of cycling provision;

- A pedestrian footpath would be located to the east of the vehicular access carriageway which would connect Hart Plain Avenue to the main entrance of the development site; and
- Showers, changing facilities and lockers for storing clothes will also be provided at the Care Home to support staff who cycle to work.

Bus Services – The nearest existing bus stops to the site are located immediately adjacent to Cowplain Community School, along Hart Plain Avenue, approximately 50m from the proposed residential development site, and 150m from the proposed care home site. These bus stops are served by the 654 bus service which is a school bus operated by First.

Additionally, bus stops are located on Milton Road and A3 London Road, approximately 400m and 550m respectively from the site. The 39, D2 and 7 The Star services can be accessed from Milton Road, while the 8 The Star service can be accessed from London Road.

As a measure to enhance the uptake of public transport, bus stop facilities on Milton Road, accessible from the proposed development, would be improved as part of the proposal, funded by the applicant. This exceeds **Policy CS20** of the Havant Borough Core Strategy as it encourages the uptake of public transport as an alternative to the private car.

Rail Services – The nearest railway station is at Bedhampton which is approximately 6.2km to the south east of the site. The railway station is accessible by means of an approximate 20-minute cycle journey. This station is served by Southern and South Western Railway and provides direct connections to Littlehampton, London Waterloo, Portsmouth and Southsea and Portsmouth Harbour. The services to London Waterloo, Portsmouth Harbour and Littlehampton run once

every hour in the mornings and evenings, including on Saturdays. The service to Portsmouth and Swansea runs three times an hour in the mornings and evenings, and two times an hour on Saturdays and Sundays.

EV Charging – One active electric vehicle charging point will be provided for each dwelling in line with the recently released Building Regulation Part S. It is envisaged that a minimum of one electric car charge point will be provided for the care home element, with the ability to expand in the future where appropriate.

Sustainable Transport Summary – In summary, the local pedestrian network provides connections to multiple local amenities and residential streets, providing good opportunities for residents, staff and visitors to travel to and from the site on foot. The site is accessible by a range of non-car modes of travel, with a number of public transport services, multi-modal opportunities and local amenities accessible on foot or by cycle.

More detailed information on transportation issues and targets is contained in the Transport Statement and Residential Travel Plan that accompanies the planning application.

3.3 Delivering a Wide Choice of High-Quality Homes

Residential dwellings will be the primary land use within the site. The care home, on Plot 1, will provide 64 bedrooms, consisting of 25 bedrooms on the ground floor, 29 bedrooms on the first floor and 10 bedrooms accommodated within roof space on the second floor. Plot 2, where the dwellings are proposed, will provide 6 dwellings; 2 detached and 4 semi-detached.

Sustainable design measures incorporated into the design of the care home and dwellings to deliver high quality homes includes:

- Optimal orientation to prioritise natural daylighting and ventilation;

- Ensuring a wide range of dwelling types to accommodate the needs of a mixture of households;
- Adaptable to the needs of people with disabilities and restricted mobility; and
- Energy efficient design and appliances to reducing operating costs for the occupiers.

Further details on how the development will deliver high quality dwellings are set out in the DAS which accompanies the application.

3.4 Requiring Good Design

The design of the development at Land at Cowplain Community School aims to respond to the site-specific constraints and includes sustainable elements, to create a well-designed development.

3.4.1 Care Home Design

The proposed care home development includes the following principles of good design:

- 64 bedrooms of varying size to allow for flexibility if the needs of future residents change;
- External gardens which will feature raised planters, together with sensory garden elements to provide stimulus to less able-bodied residents;
- Provision of high quality amenity space for the needs of all residents, including lounges, dining rooms and activity spaces to increase interaction and a sense of community, as well as external landscaping and private residents' gardens, complying with **Policy DM7** of the Havant Borough Core Strategy;
- Registration with the Care Quality Commission (CQC) and the design reflects a higher standard than minimum registration requirements;
- Provision of 30 parking spaces, including 2 disabled spaces, a dedicated services area and an ambulance/minibus drop off;
- On-site gardens, connected by a circular path which provides access to bedrooms and adjacent gardens; and
- Energy and water efficiency measures.

3.4.2 Residential Dwelling Design

The design of the dwellings will also incorporate principles of good design and sustainable elements, including:

- Each property will benefit from a front and rear garden, a driveway providing off-street parking and a detached garage;
- Retention of the existing hedgerow to increase the privacy of the dwellings;
- Energy and water efficiency measures, as detailed in **Section 3.6**

Further details on how the design of the development has evolved to incorporate a range of good design measures are set out in the DAS which accompanies the application.

3.5 Promoting Healthy Communities

Creating a high-quality development that promotes health and wellbeing and community cohesion for residents and local people is a key aim of the scheme and aligns with UN SDG 3, 'Good Health and Wellbeing'.

3.5.1 Care Home Health and Wellbeing

The design has been developed incorporating a number of features to enhance the health and wellbeing of the residents, including:

- Encouraging walking and cycling through the provision of cycling facilities and measures implemented through the Travel Plan;
- Individual bedrooms with accessible ensembles;
- Creation of a secure, private 'Parkland Garden' including a meadow area of grass and wildflowers to promote biodiversity, and a circular walking path with seating areas. The gardens are designed to provide

a variety of areas for relaxation and opportunities for resident activities, including a growing garden, a games area and activity panels; and

- The location of the development is within close proximity to a range of services and facilities, accessible on foot, by bike, or by bus.

3.5.2 Residential Dwellings Health and Wellbeing

The design of new homes will consider measures to improve internal living environments to promote health and wellbeing including:

- Prioritisation of natural ventilation, contributing to good internal air quality;
- Homes which are adaptable for the future; and
- Utilisation of materials and services that have low emission rates and pollutants.

More information on how the development has incorporated healthy living opportunities is contained within the DAS which accompanies the planning application.

3.6 Meeting the Challenge of Climate Change

One of the main challenges facing the UK and new development is the need to mitigate and adapt to a changing climate. The Government is committed to tackling climate change and in 2019 set out an ambition to extend the UK Carbon reduction target to reduce carbon emissions by 100% by 2050.

Climate change will cause the UK to become warmer, winters will become wetter, and summers will become drier. Adapting to this changing climate will impact on the design, construction, location, cost and operation of all new buildings in the next few decades. One of the NPPF's core planning principles is for development to consider climate change adaptation and mitigation during the planning process.

The Council's adopted Local Plan and Supplementary Planning Guidance support the

Government's objectives for sustainable development reducing energy use and carbon dioxide emissions, adapting to and mitigating the effects of climate change.

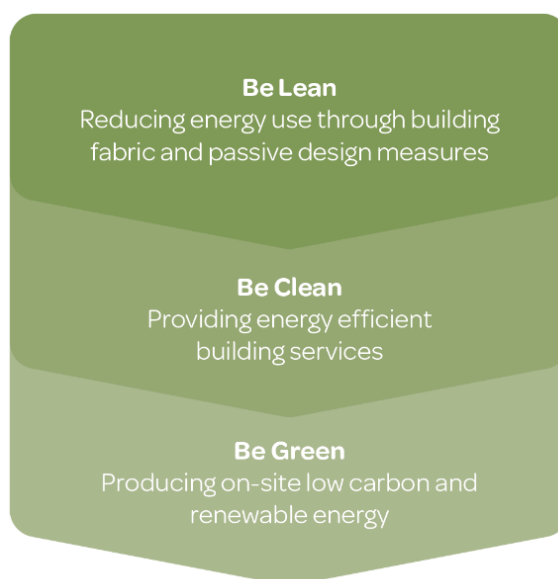
In this context the following sections outlines the key climate change mitigation and adaptation measures considered appropriate for this development based on the latest national guidance.

3.6.1 Mitigating Climate Change – Reducing carbon emissions

Developing energy efficient, low carbon homes and buildings is a key objective of national policy and recent changes to the Building Regulations, supporting the reduction of energy demand through efficient building design to reduce carbon emissions.

Both the proposed dwellings and Care Home have been designed in accordance with the Energy Hierarchy, as shown in **Figure 3**, which aims to reduce energy demand through passive design measures and a fabric first approach before utilising low carbon energy and the production of on-site renewable energy.

Figure 3: The Energy Hierarchy



Central to the delivery of low carbon and energy efficient buildings is the 'Fabric First' principle which recognises the most effective way of

minimising carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

Reducing the primary energy demand of a building through the use of an efficient fabric and services is widely regarded as best practice and is therefore the first and most important step to reducing carbon emissions.

This 'fabric first' approach has a number of distinct benefits including:

- Carbon savings delivered are 'locked-in' for the lifetime of the building (60 years or more);
- Virtually no maintenance and/or replacement costs to maintain carbon reductions through improved fabric;
- No reliance on an occupier's behaviour to deliver carbon reductions.

The homes and care home will be designed in accordance with the updated Building Regulations Part L 2021 that came into force in June 2022. For non-domestic buildings the updated building regulations require a 27% improvement over the prior Part L 2013 standard. For domestic buildings the updated building regulations require a 31% improvement over the prior Part L 2013 standard.

The Energy Strategy for the proposals at Land at Cowplain Community School have been developed in line with **Policy CS14** of the Havant Borough Core Strategy, and the energy hierarchy. The detailed design will be undertaken in line with the energy hierarchy utilising a 'Fabric First' principle which recognises the most effective way of minimising carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

The following sections set out the measures included to deliver an energy efficient, low carbon

development for the Care Home and Residential elements.

3.6.2 Care Home Energy Strategy

Harniss Consulting have completed an Energy Strategy Report⁶ which details the ways in which the proposed Care Home design responds to each phase of the energy hierarchy.

Be Lean (Use Less Energy);

As set out in section 3.6.1 the fabric first principle is central to the delivery of low carbon and energy efficient buildings. The development supports fabric first principle through the below measures;

- A significant improvement over limiting U-values within Building Regulations.
- The thermal performance of the building envelope has been maximised to its fullest within the constraints of a traditional build with 100mm cavity.
- Air permeability improved of 50% over the limiting value.
- Improved efficacy lighting specified which reduces primary energy usage.
- Automatic lighting controls used throughout, where appropriate for care i.e. proximity infrared used throughout in en-suites, bathrooms, stores, etc. timeclocks utilised for corridor night-time set back.

Be Clean (Energy Efficient Services);

The next stage of the Energy Hierarchy is the efficient supply of heat and energy.

The fixed building services for the development will be designed with energy efficiency at the forefront, with plant and systems selected to have efficiencies in excess of those required by legislation, to maximise carbon reduction.

'Be Clean' also includes the requirement to review the feasibility of connecting into an existing District Heating Network (referred to as "DHN" hereafter)

⁶ Harniss Consulting Energy Strategy Report August 2022.

where possible or providing an on-site communal heat network or individual systems.

Details of the feasibility of a DHN at Land at Cowplain Community School is set out below;

District Heating - District Heating Networks can be used to provide centralised heating to developments with a high and constant heat demand.

There are no proposed District Heating Schemes or potential Heat Source in the area. The site is largely surrounded by low-rise residential buildings and therefore there is no anchor load for a District Heat Network to connect into. Given the lack of existing nearby district heating or community heating infrastructure to connect to, a Decentralised Energy System is not considered feasible for the proposed development.

Be Green (Use of renewable energy);

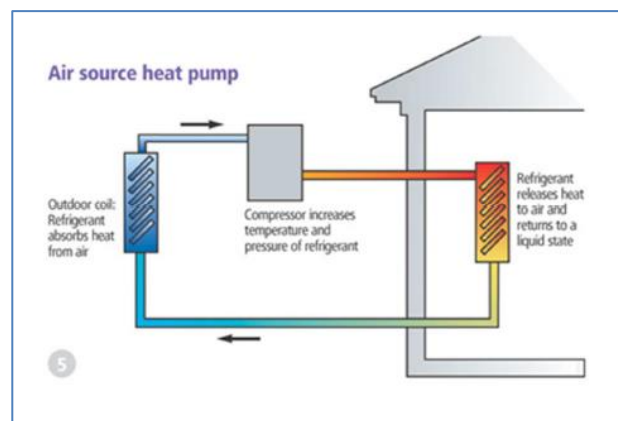
The final stage of the Energy Hierarchy is the generation of on-site low carbon and/or renewable energy to provide a further reduction in carbon emissions.

A review of potential low carbon or renewable energy technologies and their suitability for inclusion in the residential and care home elements for the proposals have been completed by Harniss as part of the energy strategy and are provided below;

Heat Pumps - Heat pumps provide low carbon heat sourced either from the ground (Ground Source Heat Pumps) or air (Air Source Heat Pumps). This type of system is suited to thermally efficient buildings. They require mains electricity to operate but typically provide around three units of heat for every unit of electricity that is consumed. Because the heat generated is at a lower temperature than that produced by a gas boiler, heat pumps typically require underfloor heating or over-sized radiators to ensure the heat is distributed efficiently. The Government anticipates that the decarbonisation of the electricity network will shift design to using electric heating systems, including heat pumps.

Air Source Heat Pumps - ASHPs extract low grade heat from the air and raise the heat to a higher temperature for domestic heating and hot water loads. They require less space than Ground source heat pumps and less maintenance than combustion-based heating systems. They also have a longer life than combustion boilers.

Heat pumps save carbon emissions. Unlike burning oil, gas, LPG or biomass, a heat pump produces no carbon emissions on site (and no carbon emissions at all, if a renewable source of electricity is used to power them). Heat pumps can also provide cooling in summer, as well as heating in winter. ASHP's are considered to be appropriate for the development.



Ground Source Heat Pumps - Ground source heat pumps (GSHP) draw heat from underground through a refrigeration cycle, and can be a very efficient solution. The ground can also be used as a source of heat and cooling. GSHPs can be either open loop or closed loop. An open loop system will require abstraction and discharge licences from the Environment Agency; a closed loop system comprises of buried pipes. This system requires extensive ground works to extract low grade heat from the earth, proving very expensive. GSHPs are not considered practical or cost-effective for care home development.

Solar Photovoltaic (PV) - Solar photovoltaic (PV) systems generate zero carbon electricity from sunlight and are well-suited to dwellings with unobstructed south-east to south-west facing roof space. Excess power is exported to the grid or can be harnessed using battery storage. Maintenance requirements are typically minimal. This type of

system would be suitable for the proposed development.



Solar Thermal - Solar thermal systems generate hot water from sunlight in a similar manner to Solar PV. They require insulated tanks to store the hot water and have greater maintenance demands than solar PV given the need to ensure anti-freeze in the pipework is topped up every few years. They can be a highly cost-effective technology

3.6.2.1 Summary – Care Home

The Care Home will achieve high fabric efficiency standards supported by the use of energy efficient building services.

Table 2: Care Home Energy and Carbon Strategy Summary⁷

Baseline Carbon Emissions (kgCO ₂ e/yr)	Building Carbon Emissions (kgCO ₂ e/yr)	% Reduction beyond Part L 2021
55,256	53,724	3%
kWh/m ² from PV	Primary Energy Demand kWh/m ²	Demand Met by PV
12.47	108.76	11%

A combination of Air source heat Pump (ASHP) and Photovoltaic array (PV) has proved to be the most appropriate renewable technologies for the proposed Care Home. The ASHP solution will provide pre-heat to the domestic hot water

generation and the PV will comprise a c.200sq.m array, subject to final panel assessment, configuration and efficiency.

3.6.3 Residential dwellings Energy Strategy

Harniss Consulting have completed an Energy Strategy Report⁸ which sets out an outline energy strategy for the proposed residential dwellings.

The development will be assessed against and comply with Building Regulations Part L 2021. An all-electric system has been adopted, with the addition of utilising low energy technology.

Be Lean (Use Less Energy);

The dwellings will achieve improvements beyond limiting U-values within current Part L 2021 Building Regulations alongside high standards of air permeability. LED lighting will be specified which reduces primary energy usage.

Be Clean (Energy Efficient Services);

The strategy for proposed dwellings is an all-electric strategy. The strategy focusses on zero on-site emission heat sources, through the use of heat pumps.

As set out in Section 3.6.2 connection to a District Heat Network is not feasible for the development.

Be Green (Use of renewable energy);

The heating of the new dwelling will be through air source heat pumps. The ASHPs will heat Low Surface Temperature Radiators Controls with each dwelling provided with programmer, room thermostats and thermostatic radiator valves.

Aside from the ASHP's further renewable sources are being reviewed by the design team. Harniss have completed a study of the feasibility of additional renewable technologies. The energy strategy report confirmed that solar PV and solar thermal will be considered as the design develops.

⁷ Data from BRUKL Output document completed by Harniss Consulting 15/08/202

⁸ Harniss Consulting Energy Strategy Report August 2022.

3.6.3.1 Summary – Residential Dwellings

The residential dwellings will achieve high standards of fabric performance in line with Part L 2021. An all-electric energy strategy through the use of ASHPs for heating will ensure the dwellings contribute to a low carbon future. The energy strategy for the residential dwellings remains under review and solar pv/solar thermal may be selected to further support the strong energy performance of the dwellings.

The energy performance and carbon emissions of the homes in line with Part L 2021 will be confirmed at detailed design.

3.6.4 Climate Change Adaptation

To ensure the proposed development is resilient to the effects of climate change it will incorporate a number of key design measures in response to the climate predictions set out in the UKCP18 projections.

The UKCP18 projections demonstrate that over time the UK will experience increased summer and winter temperatures with significantly increased maximum temperatures, reduced summer rainfall, increased winter rainfall and an increase in extreme weather events.

The UK Climate Change Risk Assessment updated in 2021 identifies key risks associated with the effects of climate change and in relation to the built environment and the proposed development these include reduced summer water availability, increased winter rainfall and increased summer temperatures.

This section identifies key measures which will be incorporated into the design of new buildings and the proposed development to adapt to climate change.

Water Efficiency

Potable water is an increasingly important natural resource and with the majority of the UK classed as being in an area of moderate or severe water

stress the conservation of water is becoming a more significant sustainability metric. Water stress is a challenge in the South East, and in Hampshire there are rules in place over how much water can be extracted from the county's two main rivers – the Test and Itchen⁹.

Therefore, the new development will aim to reduce water consumption through a range of water efficiency measures such as:

- Dual flush WCs;
- Water meters;
- Low flow fittings; and
- Where appropriate, water efficient equipment.

Through the use of these measures new homes will target a water consumption rate of 110l/p/d, adhering with **Policy CS14** which requires development to give particular attention to water efficiency measures.

Flood Risk and Drainage

A Surface and Foul Water Drainage Strategy has been prepared by Ridge and Partners LLP (referred to as 'Ridge' hereafter), which indicates that the application site is predominantly situated within Flood Zone 1, meaning the site is classified as having a less than 1 in 1,000 annual probability of river or sea flooding.

It is proposed that Sustainable Drainage Systems (SuDS) are included in the development, complying with **Policy CS15** of the Havant Borough Core Strategy. The underlying soils present at the site are unsuitable for soakaways due to the groundwater vulnerability and therefore discharge of surface water via infiltration-based SuDS features (i.e. soakaways, infiltration basins or permeable paving) is not considered appropriate. It is not possible to discharge to the nearest watercourse due to distance topography and obstructions from roads and existing buildings.

Surface water attenuation will therefore be required to temporarily store surface water on-site. It is likely that these will take the form of oversized pipes for the residential dwellings, and a geo-cellular attenuation tank for the care home. The care home site will incorporate permeable paving in the car parking spaces to offer treatment and storage capabilities. They will include an underdrain to ensure the storage capacity is available for subsequent storms. It is proposed that where possible, run-off from roof areas will be passed through a SuDS feature such as a rain garden or tree pit. Road surfaces and parking will, where possible, be permeable paving which will act as a level of treatment to the resultant surface water flows.

There will be a small amount of local flooding points under the 1 in 100-year rainfall event plus a 40% allowance for climate change. However, flood flow routes away from buildings are provided for the site, which will mitigate the effects of these flooding points.

Further information on the sites flood risk and the proposed surface water management system can be viewed in the accompanying Drainage Strategy.

Overheating

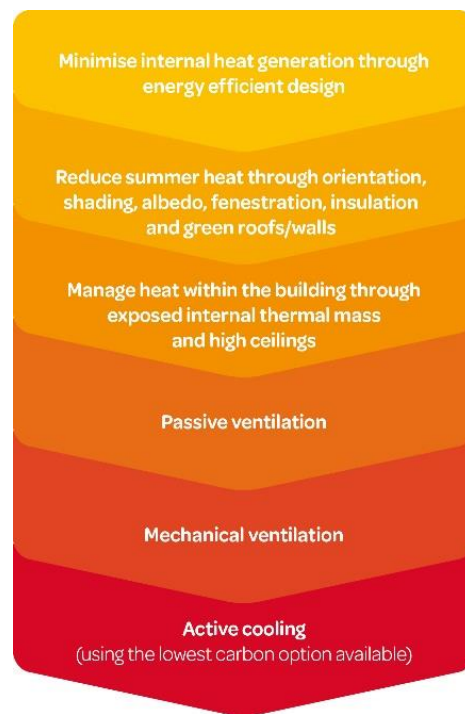
With increasing summer temperatures there is an increasing risk of overheating in buildings which could adversely affect building occupants and users, particularly in care home environments where residents are likely to be vulnerable to extreme temperatures.

All homes and buildings will be designed in accordance with the new Building Regulations Part O Overheating that came into force in June 2022. Part O requires development to reduce overheating risk through the incorporation of passive solar design measures.

Additionally, the proposed dwellings will be designed in accordance with the cooling hierarchy, as shown in **Figure 4**, which aims to reduce any potential overheating in buildings. Incorporating the cooling hierarchy into the design process

means buildings will be better equipped to manage their cooling needs and to adapt to and mitigate climate change.

Figure 4: Cooling Hierarchy



3.7 Conserving and Enhancing the Natural Environment

The proposed development will incorporate measures to support and enhance the environment through consideration of the existing site ecology, including measures to mitigate the impact of the site and enhance site biodiversity, as well as incorporate measures to reduce pollution from the site.

3.7.1 Ecology

A Preliminary Ecological Appraisal (PEA) has been prepared by The Landscape Partnership to establish the ecological status of the site and the ecological implications of the proposed development.

Cowplain School has a number of buildings in a campus type setting, with large playing fields. In the south of the school site, at some distance from the development areas, is an area of woodland, species-rich grassland and scrub. The site is

currently vacant and was previously part of The Cowplain School's outdoor playing fields.

To protect the site habitats and species a range of mitigation and enhancement measures have been proposed and recommended as part of the PEA. They can be summarised as follows:

Mitigation Measures –

- Payments to the Solent Recreation Mitigation Strategy and the Nutrient Neutrality mitigation scheme;
- Ensure that no works come closer than Root Protection Zones of retained trees and hedge;
- Garden planting should constitute at least 40% by area of species of known value to wildlife (which might include native species);
- A new native hedgerow or hedgerows should be planted, at least 25% longer than that length lost to site access; and
- Vegetation removal should take place outside the bird nesting season or vegetation should be inspected and only removed if no bird nest is found to be present.

Enhancement Measures –

A number of ecological enhancements have been proposed, which would improve the quality of the site for native flora and fauna. These enhancement measures include:

- Planting using a high proportion of native species, which support biodiversity significantly better than non-native plants. This includes orchard trees, native hedgerow and species-rich grassland;
- Twelve bat boxes, suitable for a range of bat species, should be erected on retained trees;
- Twelve bird boxes, suitable for a range of bird species, should be erected on retained trees; and

- Creation of hedgehog highways through boundary fences to allow hedgehogs to move through the site after construction is complete. Alternatively, include in fence design at least two Hedgehog Friendly Gravel Boards or similar.

The above mitigation and enhancement measures would reduce the impacts of the development proposals upon the habitats and species present. The mitigated impact is considered to be 'Neutral to Minor Positive' and therefore a biodiversity net gain can be expected. The proposed development will therefore comply with **Policy CS16** which requires development to promote wildlife and biodiversity.

3.7.2 Pollution

The proposed development will aim to minimise any negative impacts on the natural environment considering the impacts of electric systems, water use, materials, and air quality.

Electric systems – The use of renewable technologies such as ASHPs and solar PV will reduce air quality impacts compared to the sole-use of combustion systems. EV Charging points will also support the use of electric vehicles which will reduce the air quality impact of car use.

Water – Throughout construction, water quality will be maintained by the following measures:

- Reduce erosion and run-off by minimising land disturbance and leaving vegetation cover where possible;
- Cover skips and trucks loaded with construction materials and continually damp down with low levels of water;
- Use non-toxic paints, solvents and other hazardous materials wherever possible; and
- Segregate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.

Sustainable Materials – A key benefit of using sustainable and natural materials, and

incorporating material efficiency into new development, is reducing carbon emissions.

Increasingly stringent energy efficiency and operational carbon regulations means that embodied carbon is proportionately an increased contribution to climate change. Finding ways to reduce embodied carbon associated with new development is therefore becoming increasingly important.

As part of the BREEAM strategy, a Life Cycle Assessment (LCA) of the building's superstructure, sub structure and hard landscaping has been undertaken. LCA is an evaluation of the environmental effects of a product, service or process over its entire life cycle. The assessment considers all the steps that lead from raw material to manufactured product, including extraction of the materials, energy consumption, manufacture, transportation, use, recycling, and final disposal or end of life.

The assessment was undertaken using 'One Click LCA' software to estimate embodied carbon of various design scenarios. The following measures based have been chosen to reduce the embodied carbon associated with the development:

- Loadbearing masonry walls forming the majority of the external walls;
- Majority timber roof structure instead of steel; and,
- Beam and Block ground floor construction.

As demonstrated above, the development proposes the use of natural resources where possible, including timber.

During detailed design, the LCA will be revisited to consider further measures to reduce construction carbon. At this stage, the supply chain will be further progressed and options open to the team will be better known. Such measures could include incorporation of recycled materials such as ground granulated blast-furnace slag (GGBS) as a cement alternative within the foundations, slab and frame of the building. Furthermore, concrete and brick

paving products with reduced embodied carbon may be available and will be considered.

Where possible, materials will be procured locally, to reduce carbon emissions associated with the transport of materials.

The development specification will also prioritise responsible supply chains such as those who hold FSC and BES6001 certification.

Insulation materials containing substances known to contribute to stratospheric ozone depletion or with the potential to contribute to global warming will not be used. Natural insulation materials such as mineral wool, rock wool or cork board will be considered as they are amongst the lowest Global Warming Potential (GWP) rating.

3.8 Waste Management

Construction Waste Management

Prior to the construction phase a Construction Environmental Management Plan (CEMP) will be developed to ensure the use of measures to minimise waste during the construction phases of the development, including the use of a scheme for recycling/disposing of waste arising from demolition and construction works.

The reduction, reuse and recycling of construction waste is to be prioritised through measures such as avoidance of over-ordering, supervision of deliveries, use of secure materials storage facilities and reuse of materials onsite where feasible.

In addition, the development will be registered with the Considerate Constructors Scheme and achieve certification against the Code of Considerate Practice.

Operational Waste Management

In accordance with the principles of the waste hierarchy the development will make provision for the storage of non-recyclable waste and recyclable waste including dedicated storage for waste in new homes to encourage residents to recycle waste materials.

Full consideration will be given to the Council's waste management infrastructure and services to ensure that the occupiers have the necessary infrastructure to participate in any kerbside recycling services.

4. BREEAM Strategy

This Chapter introduces BREEAM and sets out the strategy proposed for the care home to achieve a 'Very Good' rating in line with Policy CS14 of the Havant Borough Core Strategy.

4.1 BREEAM

BREEAM is the world's leading sustainability assessment tool for new buildings. The scheme is operated by the Building Research Establishment (BRE) and includes a range of criteria against which the sustainability performance of new buildings are assessed.



Since its launch in 1990, BREEAM has been used to certify over 560,000 assessments of buildings across 82 countries. BREEAM has a number of schemes which can be applied to new buildings, refurbishments and existing buildings. Additionally, each scheme regularly updated to ensure it continues to recognise and reward developments that go beyond minimum practice and requirements, for example those set out by Building Regulations.

4.2 BREEAM Strategy

Turley Sustainability (BREEAM Advisory Professional and Licenced Assessor) has undertaken a pre-assessment of the building (see **Appendix 1**) using the New Construction 2018 'Multi-Residential' methodology. Turley has extensive experience providing early-stage guidance and certifying several multi-residential buildings, including care homes similar to this development. Several workshops have been attended with the project team to assess the technical feasibility and viability of achieving a BREEAM 'Very Good' rating.

BREEAM covers multi-residential and non-domestic buildings only and is therefore not applicable to the homes.

The results of the pre-assessment and workshops with the team demonstrate a route to the achievement of 'Very Good'. The current targeted score is 59.75% which would deliver a 'Very Good' rating (55% required) with a reasonable contingency.

Table 2 sets out a potential route to BREEAM Very Good and targeted credits. It should be noted that the credits achieved as part of the final scheme may vary, as is the norm as the development progresses.

Table 2: BREEAM New Construction 2018 Pre-assessment Results

Category	Percentage Targeted
Management	8.9%
Health & Wellbeing	7%
Energy	5.09%
Transport	6.67%
Water	5.44%
Materials	10.71%
Waste	3.6%
Land Use & Ecology	5%
Pollution	5.33%
Exemplary	2%
Score	59.75% (Very Good)

A summary of credits targeted within each category for the pre-assessment, and the value that meeting the criteria brings to the development, is discussed in the following sections. A full breakdown of each credit targeted is provided within **Appendix 1**.

4.2.1 Management

The management category encourages the adoption of sustainable management practices in connection with design, construction, commissioning, handover and aftercare.



The credits within this category are awarded to project and design teams who consider and

incorporate sustainability measures, involving key stakeholders from project brief through to occupation.

Sustainability practices targeted include life cycle costing, seasonal commissioning, consideration of construction site impacts, testing of building fabric and post occupancy evaluation.

4.2.2 Health and Wellbeing

The Health and Wellbeing category of the BREEAM schemes has been aligned with the 'WELL' Standard, bringing the comfort of building occupiers to the forefront of the design.

Overheating within buildings is likely to be a significant effect of climate change and will be considered within the design for both current and future climate scenarios.

The indoor air quality, visual comfort, and thermal comfort of the care home will be prioritised to ensure a comfortable, high quality living environment for the residents and staff.

Furthermore, the residents will have ample access to outside space, including extensive gardens, to contribute towards their health and wellbeing.

4.2.3 Energy

The Energy category encourages the specification and design of energy efficient solutions, systems and equipment. The credit requirements support the reduction of carbon emissions throughout the operational phase of the development proposal.

Unregulated energy will be reduced through careful specification of large energy consuming systems such as lifts.

Furthermore, extensive sub-metering will allow the building user to monitor energy performance to establish possible efficiencies during operation.

4.2.4 Transport

A Transport Assessment has been undertaken to assess the effect of the development on local transport infrastructure. A Travel Plan has also been produced to communicate proposed sustainable transport measures to reduce private

car travel to and from site, and increase the uptake of sustainable and active modes of travel.

Credits are awarded on the basis of number of transport options available to the site pre-development and as a result of the development.

As discussed in **Section 3.2**, the development proposals will provide cycle parking on site, and an additional 10 secure cycle parking spaces in the form of five Sheffield stands. Additionally, a pedestrian footpath would be located to the east of the vehicular access carriageway which would connect Hart Plain Avenue to the main entrance of the development site. As part of the development proposals, nearby bus stop facilities would be improved to enhance the existing public transport infrastructure. Furthermore, the development users will benefit from the local amenities nearby.

4.2.5 Water

The aim of the Water category is to reduce the consumption of internal and external potable water over the lifetime of the building and minimising losses through leakage.

To reduce water consumption through sanitary uses and achieve a reduction of the baseline water use defined by the BRE (as discussed in **Section 3.6**), the following measures will be implemented:

- Low flush WCs;
- Flow restricted showers and taps; and,
- Water efficient kitchen and catering equipment.

The detailed design and specification will confirm the final measures incorporated to reduce internal water usage.

Water usage will also be monitored through water meters and a leak detection system.

4.2.6 Materials

The Materials category encourages development to take a 'whole life cycle' approach to construction products, considering impacts of the supply chain from raw material, to end-of-life.

At concept design, a life cycle assessment of the development's superstructure (external walls, frame, roof etc.), substructure and hard landscaping has been undertaken, to model the environmental impact, including carbon emissions, associated with construction and materials. An options appraisal will be undertaken to identify carbon 'hotspots', and any measures which could reduce these emissions. An update will then be provided at Technical Design to assess the impact of the superstructure.

To reduce material wastage associated with maintenance and replacement, protection measures will be incorporated into the detailed design to protect from damage that may arise from residents, patients, staff and visitors, such as protecting internal areas from trolley movement, pedestrian traffic or external areas from parking and/or delivery vehicles.

The design team will also consider the effect of environmental factors such as water ingress, solar radiation and temperature variation on the building.

Manufacturers with responsible sourcing accreditation, for example, BES6001, ISO14001, FSC and CARES certification will be prioritised during construction.

4.2.7 Waste

The Waste category encourages the reduction of waste associated with construction methods through measures implemented during the design and on-site management. The category also rewards design measures encouraging the building users to recycle waste during building operation.

The proposed development will minimise construction and operational waste in line with the measures set out within the waste (**Section 3.8**) of this report.

Additionally, the design is flexible and adaptable to climate change, change in use and refurbishment to reduce the environmental impacts of excess material usage and waste in the future.

4.2.8 Land Use and Ecology

The aim of the Land Use and Ecology category is to encourage sustainable land use, habitat protection and creation and improvement of long-term biodiversity.

As discussed within **Section 3.7**, a Preliminary Ecological Appraisal has been prepared by The Landscape Partnership. The Appraisal provides a number of ecological enhancement measures which would improve the quality of the site for native flora and fauna. These include planting using native species to support biodiversity and climate resilience, and the creation of habitats for birds, bats, and hedgehogs.

4.2.9 Pollution

The aim of the Pollution category is to address the prevention and control of pollution and surface water run-off associated with the building's location and use.

Pollution issues covered within the credit requirements include light, noise, flooding and emissions to air, land and water.

Furthermore, pollution impacts associated with light and noise will be reduced and managed appropriately.

A FRA has been undertaken which identifies any risks to the development, and appropriate mitigation measures in line with the drainage hierarchy. The FRA classifies the site as within Flood Zone 1, and at low risk of flooding from rivers and sea. It is also at low risk of flooding from groundwater, sewers, reservoirs, canals and other artificial sources, as set out in **Section 3.6**.

4.3 Summary

The above section summarises the credits targeted by the proposed development to achieve a 'Very Good' rating on the new construction assessment. The credits targeted equate to a score of circa 60% which would achieve the required scores with a significant margin of safety.

It should be noted that this Sustainability Statement does not guarantee the award of these credits, and may not reflect the final route to achieve the required BREEAM ratings. Credits may be removed and replaced with others which may be more viable over the course of the design and construction.

5. Conclusion

This Sustainability Statement has been prepared to demonstrate how the proposed development responds positively to national and local sustainable policy requirements.

The proposed development at Land at Cowplain Community School has been designed to respond positively to national and local plan policy incorporating measures to deliver social and economic benefits, while also protecting and enhancing the environment where possible. This includes the consideration of measures to mitigate and adapt to the effects of climate change.

The Sustainability Statement sets out key sustainable design measures incorporated at this stage and to be considered during the detailed design of the care home, and dwellings.

Social and Economic Benefits – The development aims to provide a range of social and economic benefits to both new and existing residents, through:

- Provision of a 64-bedroom care home and six new dwellings, providing opportunities for local people;
- Incorporation of sustainable transport measures to encourage active travel in the form of walking and cycling, through provision of cycle storage and facilities;

- A development in a sustainable location with a range of services and amenities within walking distance of the site; and
- Homes designed to create healthy living environments which are flexible for the future.

Environmental Protection and Enhancement – Through a range of design measures the development aims to protect and enhance the local environment, including:

- Buildings designed to make use of sustainable materials to reduce environmental impacts of construction;
- Provision of measures to protect on-site ecology and biodiversity enhancement measures, helping to reduce the impact of climate change on site habitats; and
- Provision of measures through construction and operation of the site to reduce pollution, minimise waste and encourage recycling.

Mitigating and Adapting to Climate Change – In recognition of the climate emergency, the development will incorporate a range of measures to reduce carbon emissions, mitigating the effects of climate change, and adaptation measures to ensure the long-term resilience of the development to the effects of climate change. Measures include:

- Buildings designed to reduce carbon emissions in accordance with the updated Building Regulations through the use of energy hierarchy, using a fabric first approach to design to reduce energy demand, and the inclusion of ASHP and

Solar PV helping mitigate the effects of climate change;

- Specification of water efficient fittings to reduce water consumption to 110 litres per person per day in line with the government's higher water efficiency standard;
- Reduced emissions associated with private car travel though development in a sustainable location, with access to public transport and amenities, EV

Charging Points and provision of cycle storage;

- Development of new homes in Flood Zone 1 and provision of a surface water drainage system designed to mitigate for a small amount of flood water under a 1 in 100 annual probability plus 40% climate change rainfall event; and
- Homes designed to take into account increasing annual temperatures set out in the UKCP18 climate projections to minimise the risk of overheating.

Frontier Estates Ltd are committed to the delivery of sustainable homes which include measures which provide economic and social benefits, protect and enhance the environment, as well as mitigating and adapting to the long-term effects of climate change.

Appendix 1 – BREEAM pre-assessment



Cowplain Care Home (Frontier)

BREEAM New Construction 2018 (Multi-Residential - Care Home)

Pre-Assessment Rev E: 18/08/22



TARGET (>55%)	59.75%	Very Good				
Credit Summary BREEAM 2018: Multi-Residential			Credit Ref.	Credits Available	Very Good Target	Potential Extra Credits
MANAGEMENT						
Credit Value 0.52%	Project Brief and Design	Project Delivery Planning	Man 01	1	1	
		Stakeholder Consultation		1	1	
		BREEAM Advisory Professional		1	0	Possible
				1	0	Possible

	Life Cycle Costing (LCC) and Service Life Planning	Elemental Life Cycle Cost	Man 02	2	0	
		Component Life Cycle Cost		1	1	
		Capital Cost Reporting		1	1	
	Responsible Construction Practices	Legally harvested and traded timber - Pre-requisite	Man 03	-	Y	
		Environmental Management		1	1	
		Sustainability Champion		1	1	
		Responsible Construction Management (1 credit mandatory)		2	2	
		Monitoring of Construction Site Impacts		2	2	
	Commissioning and Handover	Commissioning and Testing Schedule and Responsibilities	Man 04	1	1	
		Commissioning Building Services		1	1	
		Testing and Inspecting Building Fabric		1	1	
		Handover (Building User Guide mandatory)		1	1	

	Aftercare	Aftercare Support	Man 05	1	1	
		Commissioning - Implementation		1	1	
		Post Occupancy Evaluation		1	1	
Section Credit Total				21	17	
Weighted Section Total				11%	8.90%	

HEALTH & WELLBEING						
Credit Value 0.78%	Visual Comfort	Glare control	Hea 01	1	1	
		Daylight factors		1	0	
		View Out		1	0	
		Internal and External Lighting Levels		1	1	
	Indoor Air Quality	Indoor Air Quality Pre-Requisite	Hea 02	-	Y	
		Ventilation		1	0	
		Emissions from Construction Products		2	0	
		Post Construction Indoor Air Quality Management		1	1	
		Thermal modelling		1	1	

	Thermal Comfort	Adaptability for projected climate change scenario	Hea 04	1	1	
		Thermal Zoning and Controls		1	1	
	Acoustic Performance	Sound Insulation	Hea 05	2	1	
		Indoor Ambient Noise Levels		1	0	Possible
		Room Acoustics		1	0	Possible
	Security		Hea 06	1	1	
	Safe and Healthy Surroundings	Safe access	Hea 07	1	0	
		Outside Space		1	1	
Section Credit Total				18	9	
Weighted Section Total				14%	7.00%	
ENERGY						

Credit Value 0.73%	Reduction of Energy Use and Carbon Emissions	Energy Performance Ratio	Ene 01	9	1	Possible
		Prediction of Operational Energy Consumption		4	0	Possible
	Energy Monitoring	Sub-metering End-Use Categories	Ene 02	1	1	
	External Lighting		Ene 03	1	1	
	Low Carbon Design	Passive Design Analysis (PDA)	Ene 04	1	1	
		Free Cooling		1	0	
		Low and Zero Carbon Feasibility Study		1	1	

	Energy Efficient Transportation Systems	Energy Consumption	Ene 06	1	1	
		Energy Efficient Features		1	1	
	Energy Efficient Equipment		Ene 08	2	0	
	Section Credit Total			22	7	
Weighted Section Total			16%	5.09%		
TRANSPORT						
Credit Value 0.83%	Transport Assessment and Travel Plan		Tra 01	2	2	
	Sustainable Transport Measures		Tra 02	10	6	
Section Credit Total			12	8		
Weighted Section Total			10.0%	6.67%		
WATER						

Credit Value 0.78%	Water Consumption (1 credit mandatory)	Wat 01	5	3	
	Water Monitoring	Wat 02	1	1	

	Water Leak Detection & Prevention	Leak Detection System	Wat 03	1	1	
		Flow Control Devices		1	1	
	Water Efficient Equipment		Wat 04	1	1	
Section Credit Total				9	7	
Weighted Section Total				7%	5.44%	
MATERIALS						
Credit Value 1.07%	Environmental Impacts from Construction Products - Building Life Cycle Assessment (LCA)		Mat 01	7	7	
	Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)		Mat 02	1	0	
	Responsible Sourcing of Construction Products	Pre-requisite - Legal and Sustainable Timber	Mat 03	-	Y	
		Enabling Sustainable Procurement		1	0	
		Measuring Responsible Sourcing		3	2	
	Designing for Durability and Resilience		Mat 05	1	1	

	Material Efficiency	Mat 06	1	0	
Section Credit Total			14	10	
Weighted Section Total			15.0%	10.71%	

WASTE						
Credit Value 0.60%	Construction Waste Management	Pre-Demolition Audit	Wst 01	1	0	
		Construction Resource Efficiency		3	1	1
		Diversion of Resources from Landfill		1	1	
	Use of Recycled and Sustainably Sourced Aggregates		Wst 02	1	0	0
	Operational Waste		Wst 03	1	1	
	Adaptation to Climate Change		Wst 05	1	1	
	Design for Disassembly and Adaptability		Wst 06	2	2	
Section Credit Total				10	6	
Weighted Section Total				6.0%	3.60%	
LAND USE & ECOLOGY						
Credit Value	Site Selection	Previously Developed Land	LE 01	1	0	0

1.00%		Contaminated Land		1	0	0
	Ecological Risks and Opportunities		LE 02	2	2	
	Managing Negative Impacts on Ecology	Prerequisite - Ecological risks and Opportunities	LE 03	-	Y	
		Planning and Measures On-site		1	1	
		Managing Negative Impacts		2	1	
	Ecological Change and Enhancement	Prerequisite - Managing Negative Impacts on Ecology	LE 04	-	Y	
		Ecological Enhancement		1	1	

	Change and Enhancement of Ecology		3	0	1
	Long Term Ecological Management and Maintenance	LE 05	2	0	0
Section Credit Total			13	5	
Weighted Section Total			13%	5.00%	

POLLUTION						
Credit Value 0.67%	Impact of Refrigerants	Prerequisite	Pol 01	-	Y	
		Impact of Refrigerants		2	0	1
		Leak Detection		1	1	
	Local Air Quality		Pol 02	2	1	1
	Surface Water Run Off	Low Flood Risk	Pol 03	2	2	
		Surface Water Run-Off - Rate		1	1	
		Surface water Run-Off - Volume		1	1	
		Minimise watercourse pollution		1	0	0
	Reduction of Night Time Light Pollution		Pol 04	1	1	

	Reduction of Noise Pollution	Pol 05	1	1	
Section Credit Total			12	8	
Weighted Section Total			8%	5.33%	

INNOVATION				
Credit Value 1.00%	Man 03 Responsible Construction Practices	1	1	
	Hea 01 Visual Comfort	1	0	
	Hea 06 Security	1	0	
	Ene 01 Beyond Zero Net Regulated Carbon	3	0	
	Ene 01 Post Occupancy Stage	2	0	
	Wat 01 Water Consumption	1	0	
	Mat 01 Life Cycle Impacts	3	1	
	Mat 03 Responsible Sourcing of Materials	1	0	
	Wst 01 Construction Waste Management	1	0	
	Wst 02 Recycled Aggregates	1	0	
	Wst 05 Adaptation to climate change	1	0	
	LE 02 Ecological Risks and Opportunities	1	0	
	LE 04 Ecological Change and Enhancement	1	0	
Section Credit Total		18	2	
Weighted Section Total		18%	2%	
Disclaimer	It should be noted therefore that this score is indicative only at this stage and must be reviewed throughout design development as well as audited by the BRE to confirm the final rating.	TARGET RATING		59.75%

Appendix 2 – BRUKL Output for Care Home

Project name

2101 - Cowplain School Development - Be Green

As designed

Date: Tue Aug 09 08:05:18 2022

Administrative information

Building Details

Address: Land at Cowplain Community School, Hart Plain Avenue, Waterloo, PO8 8RY

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.4"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.4

BRUKL compliance check version: v6.1.b.0

Foundation area [m²]: 1086.02The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	16.96
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	16.49
Target primary energy rate (TPER), kWh/m ² annum	111.31
Building primary energy rate (BPER), kWh/m ² annum	108.76
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

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

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.21	0.21	External Wall
Floors	0.18	0.15	0.15	Ground Floor
Pitched roofs	0.16	0.13	0.13	Roof
Flat roofs	0.18	-	-	No flat roofs in project
Windows** and roof windows	1.6	1.45	1.45	ED.05 - 1.022x2.4
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	-	-	No personnel doors in project
Vehicle access & similar large doors	1.3	-	-	No vehicle access or similar large doors in project
High usage entrance doors	3	-	-	No high usage entrance doors in project

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check.

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Rad Heat/Nat vent

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.97	-	-	-	-
Standard value	0.93*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

2- Rad Heat/Extract (88 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.97	-	-	-	-
Standard value	0.93*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

3- VRF/Mech Vent (6 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	-	-	1.1	0.8
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

4- VRF/Nat Vent (4 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	-	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

5- Kitchen (2 - Kitchen 1)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.97	-	-	1	-
Standard value	0.93*	N/A	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

6- laundry (2 - Laundry 1)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0	-	-	1.4	0.8
Standard value	N/A	N/A	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

7- Rad heat/Mech Vent (24 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.97	-	-	1.1	0.8
Standard value	0.93*	N/A	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

1- ASHP Pre heat

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1.52	0
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
0 - Ensuite 1	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 2	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 3	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 4	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 5	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 6	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 7	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 8	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 9	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 10	0.3	-	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 11	0.3	-	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I		
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
0 - Ensuite 12		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 13		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 14		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 15		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 16		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 17		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 18		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 19		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 20		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 21		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 22		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 23		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 24		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Ensuite 25		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Dining Room 1		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Lounge 1		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - WC 1		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - WC 2		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - WC 3		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Nurse Station 1		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Sluice 1		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Assisted Bath 1		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Housekeeping St 1		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Hoist 1		0.3	-	-	-	-	-	-	-	-	-	N/A
0 - Hair 1		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Cafe 1		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Cinema 1		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Corridor 1		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Corridor 2		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Corridor 3		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Corridor 4		-	-	-	1.1	-	-	-	-	-	-	N/A
0 - Corridor 5		-	-	-	1.1	-	-	-	-	-	-	N/A
1 - Ensuite 1		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 2		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 3		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 4		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 5		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 6		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 7		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 8		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 9		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 10		0.3	-	-	-	-	-	-	-	-	-	N/A
1 - Ensuite 11		0.3	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
1 - Ensuite 12	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 13	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 14	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 15	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 16	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 17	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 18	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 19	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 20	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 21	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 22	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 23	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 24	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 25	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 26	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 27	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 28	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Ensuite 29	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Assisted Bath 1	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Dining Room 1	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Lounge/Dining 1	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Lounge/Dining 2	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Assisted WC 1	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Assisted WC 2	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Assisted WC 3	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Sluice 1	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Nurse Base 1	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Housekeeping 1	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Hoist 1	0.3	-	-	-	-	-	-	-	-	-	N/A	
1 - Quiet Lounge 1	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Corridor 1	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Corridor 2	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Corridor 3	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Corridor 4	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Corridor 5	-	-	-	1.1	-	-	-	-	-	-	N/A	
1 - Corridor 6	-	-	-	1.1	-	-	-	-	-	-	N/A	
2 - Ensuite 1	0.3	-	-	-	-	-	-	-	-	-	N/A	
2 - Ensuite 2	0.3	-	-	-	-	-	-	-	-	-	N/A	
2 - Ensuite 3	0.3	-	-	-	-	-	-	-	-	-	N/A	
2 - Ensuite 4	0.3	-	-	-	-	-	-	-	-	-	N/A	
2 - Ensuite 5	0.3	-	-	-	-	-	-	-	-	-	N/A	
2 - Ensuite 6	0.3	-	-	-	-	-	-	-	-	-	N/A	
2 - Ensuite 7	0.3	-	-	-	-	-	-	-	-	-	N/A	

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I		
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
2 - Ensuite 8		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Ensuite 9		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Ensuite 10		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Sluice 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Nurse Base 1		-	-	-	1.1	-	-	-	-	-	-	N/A
2 - Male Change 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Female Change 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Laundry 1		-	-	-	1.4	-	-	-	-	-	-	N/A
2 - Kitchen 1		-	-	-	-	-	-	-	-	1	-	N/A
2 - Housekeeping 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Chef Change 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Chef Office 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Cleaners Store 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Assisted Bath 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Hoist 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Assisted WC 1		0.3	-	-	-	-	-	-	-	-	-	N/A
2 - Dining 1		-	-	-	1.1	-	-	-	-	-	-	N/A
2 - Lounge 1		-	-	-	1.1	-	-	-	-	-	-	N/A
2 - Corridor 1		-	-	-	1.1	-	-	-	-	-	-	N/A
2 - Corridor 2		-	-	-	1.1	-	-	-	-	-	-	N/A
2 - Corridor 3		-	-	-	1.1	-	-	-	-	-	-	N/A
2 - Corridor 4		-	-	-	1.1	-	-	-	-	-	-	N/A
2 - Corridor 5		-	-	-	1.1	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
0 - Bedroom 1		-	-	-
0 - Bedroom 2		-	-	-
0 - Bedroom 3		-	-	-
0 - Bedroom 4		-	-	-
0 - Bedroom 5		-	-	-
0 - Bedroom 6		-	-	-
0 - Bedroom 7		-	-	-
0 - Bedroom 8		-	-	-
0 - Bedroom 9		-	-	-
0 - Bedroom 10		-	-	-
0 - Bedroom 11		-	-	-
0 - Bedroom 12		-	-	-
0 - Bedroom 13		-	-	-
0 - Bedroom 14		-	-	-
0 - Bedroom 15		-	-	-
0 - Bedroom 16		-	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
0 - Bedroom 17		-	-	-
0 - Bedroom 18		-	-	-
0 - Bedroom 19		-	-	-
0 - Bedroom 20		-	-	-
0 - Bedroom 21		-	-	-
0 - Bedroom 22		-	-	-
0 - Bedroom 23		-	-	-
0 - Bedroom 24		-	-	-
0 - Bedroom 25		-	-	-
0 - Ensuite 1		-	-	-
0 - Ensuite 2		-	-	-
0 - Ensuite 3		-	-	-
0 - Ensuite 4		-	-	-
0 - Ensuite 5		-	-	-
0 - Ensuite 6		-	-	-
0 - Ensuite 7		-	-	-
0 - Ensuite 8		-	-	-
0 - Ensuite 9		-	-	-
0 - Ensuite 10		-	-	-
0 - Ensuite 11		-	-	-
0 - Ensuite 12		-	-	-
0 - Ensuite 13		-	-	-
0 - Ensuite 14		-	-	-
0 - Ensuite 15		-	-	-
0 - Ensuite 16		-	-	-
0 - Ensuite 17		-	-	-
0 - Ensuite 18		-	-	-
0 - Ensuite 19		-	-	-
0 - Ensuite 20		-	-	-
0 - Ensuite 21		-	-	-
0 - Ensuite 22		-	-	-
0 - Ensuite 23		-	-	-
0 - Ensuite 24		-	-	-
0 - Ensuite 25		-	-	-
0 - Stairs 1		-	-	-
0 - Stairs 2		-	-	-
0 - Stairs 3		-	-	-
0 - Refuse Store 1		100	-	-
0 - Comms 1		100	-	-
0 - Dining Room 1		-	-	-
0 - Lounge 1		-	-	-
0 - Store 1		100	-	-
0 - Store 2		100	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
0 - Store 3		100	-	-
0 - Store 4		100	-	-
0 - Store 5		100	-	-
0 - Store 6		100	-	-
0 - WC 1		-	-	-
0 - WC 2		-	-	-
0 - WC 3		-	-	-
0 - Med Store 1		100	-	-
0 - Nurse Station 1		100	-	-
0 - Sluice 1		100	-	-
0 - Assisted Bath 1		-	-	-
0 - Housekeeping St 1		100	-	-
0 - Store 7		100	-	-
0 - Hoist 1		100	-	-
0 - Hair 1		-	-	-
0 - Managers Office 1		100	-	-
0 - Cafe 1		-	-	-
0 - Cinema 1		-	-	-
0 - Admin Office 1		100	-	-
0 - Lobby 1		-	-	-
0 - Corridor 1		-	-	-
0 - Corridor 2		-	-	-
0 - Corridor 3		-	-	-
0 - Corridor 4		-	-	-
0 - Corridor 5		-	-	-
1 - Bedroom 1		-	-	-
1 - Bedroom 2		-	-	-
1 - Bedroom 3		-	-	-
1 - Bedroom 4		-	-	-
1 - Bedroom 5		-	-	-
1 - Bedroom 6		-	-	-
1 - Bedroom 7		-	-	-
1 - Bedroom 8		-	-	-
1 - Bedroom 9		-	-	-
1 - Bedroom 10		-	-	-
1 - Bedroom 11		-	-	-
1 - Bedroom 12		-	-	-
1 - Bedroom 13		-	-	-
1 - Bedroom 14		-	-	-
1 - Bedroom 15		-	-	-
1 - Bedroom 16		-	-	-
1 - Bedroom 17		-	-	-
1 - Bedroom 18		-	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
1 - Bedroom 19		-	-	-
1 - Bedroom 20		-	-	-
1 - Bedroom 21		-	-	-
1 - Bedroom 22		-	-	-
1 - Bedroom 23		-	-	-
1 - Bedroom 24		-	-	-
1 - Bedroom 25		-	-	-
1 - Bedroom 26		-	-	-
1 - Bedroom 27		-	-	-
1 - Bedroom 28		-	-	-
1 - Bedroom 29		-	-	-
1 - Ensuite 1		-	-	-
1 - Ensuite 2		-	-	-
1 - Ensuite 3		-	-	-
1 - Ensuite 4		-	-	-
1 - Ensuite 5		-	-	-
1 - Ensuite 6		-	-	-
1 - Ensuite 7		-	-	-
1 - Ensuite 8		-	-	-
1 - Ensuite 9		-	-	-
1 - Ensuite 10		-	-	-
1 - Ensuite 11		-	-	-
1 - Ensuite 12		-	-	-
1 - Ensuite 13		-	-	-
1 - Ensuite 14		-	-	-
1 - Ensuite 15		-	-	-
1 - Ensuite 16		-	-	-
1 - Ensuite 17		-	-	-
1 - Ensuite 18		-	-	-
1 - Ensuite 19		-	-	-
1 - Ensuite 20		-	-	-
1 - Ensuite 21		-	-	-
1 - Ensuite 22		-	-	-
1 - Ensuite 23		-	-	-
1 - Ensuite 24		-	-	-
1 - Ensuite 25		-	-	-
1 - Ensuite 26		-	-	-
1 - Ensuite 27		-	-	-
1 - Ensuite 28		-	-	-
1 - Ensuite 29		-	-	-
1 - Stairs 1		-	-	-
1 - Stairs 2		-	-	-
1 - Stairs 3		-	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
1 - Assisted Bath 1		-	-	-
1 - Dining Room 1		-	-	-
1 - Lounge/Dining 1		-	-	-
1 - Lounge/Dining 2		-	-	-
1 - Store 1		100	-	-
1 - Store 2		100	-	-
1 - Store 3		100	-	-
1 - Store 4		100	-	-
1 - Store 5		100	-	-
1 - Store 6		100	-	-
1 - Assisted WC 1		-	-	-
1 - Assisted WC 2		-	-	-
1 - Assisted WC 3		-	-	-
1 - Med Store 1		100	-	-
1 - Sluice 1		100	-	-
1 - Nurse Base 1		100	-	-
1 - Housekeeping 1		100	-	-
1 - Hoist 1		100	-	-
1 - Quiet Lounge 1		-	-	-
1 - Corridor 1		-	-	-
1 - Corridor 2		-	-	-
1 - Corridor 3		-	-	-
1 - Corridor 4		-	-	-
1 - Corridor 5		-	-	-
1 - Corridor 6		-	-	-
2 - Bedroom 1		-	-	-
2 - Bedroom 2		-	-	-
2 - Bedroom 3		-	-	-
2 - Bedroom 4		-	-	-
2 - Bedroom 5		-	-	-
2 - Bedroom 6		-	-	-
2 - Bedroom 7		-	-	-
2 - Bedroom 8		-	-	-
2 - Bedroom 9		-	-	-
2 - Bedroom 10		-	-	-
2 - Ensuite 1		-	-	-
2 - Ensuite 2		-	-	-
2 - Ensuite 3		-	-	-
2 - Ensuite 4		-	-	-
2 - Ensuite 5		-	-	-
2 - Ensuite 6		-	-	-
2 - Ensuite 7		-	-	-
2 - Ensuite 8		-	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
2 - Ensuite 9		-	-	-
2 - Ensuite 10		-	-	-
2 - Sluice 1		100	-	-
2 - Nurse Base 1		100	-	-
2 - Med Store 1		100	-	-
2 - Male Change 1		-	-	-
2 - Female Change 1		-	-	-
2 - Laundry 1		-	-	-
2 - Kitchen 1		-	-	-
2 - Staircase 1		-	-	-
2 - Staircase 2		-	-	-
2 - Staff Room 1		-	-	-
2 - Housekeeping 1		100	-	-
2 - Chef Change 1		-	-	-
2 - Chef Office 1		100	-	-
2 - Cleaners Store 1		100	-	-
2 - Assisted Bath 1		-	-	-
2 - Hoist 1		100	-	-
2 - Assisted WC 1		-	-	-
2 - Dining 1		-	-	-
2 - Lounge 1		-	-	-
2 - Corridor 1		-	-	-
2 - Corridor 2		-	-	-
2 - Corridor 3		-	-	-
2 - Corridor 4		-	-	-
2 - Corridor 5		-	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
0 - Bedroom 1	NO (-48%)	NO
0 - Bedroom 2	NO (-41%)	NO
0 - Bedroom 3	NO (-29%)	NO
0 - Bedroom 4	NO (-20%)	NO
0 - Bedroom 5	NO (-44%)	NO
0 - Bedroom 6	NO (-66%)	NO
0 - Bedroom 7	NO (-66%)	NO
0 - Bedroom 8	NO (-51%)	NO
0 - Bedroom 9	NO (-44%)	NO
0 - Bedroom 10	NO (-60%)	NO
0 - Bedroom 11	NO (-59%)	NO
0 - Bedroom 12	NO (-45%)	NO
0 - Bedroom 13	NO (-64%)	NO
0 - Bedroom 14	NO (-27%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
0 - Bedroom 15	NO (-23%)	NO
0 - Bedroom 16	NO (-32%)	NO
0 - Bedroom 17	NO (-29%)	NO
0 - Bedroom 18	NO (-20%)	NO
0 - Bedroom 19	NO (-18%)	NO
0 - Bedroom 20	NO (-22%)	NO
0 - Bedroom 21	NO (-15%)	NO
0 - Bedroom 22	NO (-16%)	NO
0 - Bedroom 23	NO (-17%)	NO
0 - Bedroom 24	NO (-17%)	NO
0 - Bedroom 25	NO (-2%)	NO
0 - Comms 1	N/A	N/A
0 - Dining Room 1	NO (-62%)	NO
0 - Lounge 1	NO (-46%)	NO
0 - Med Store 1	N/A	N/A
0 - Nurse Station 1	N/A	N/A
0 - Managers Office 1	NO (-24%)	NO
0 - Cafe 1	NO (-6%)	NO
0 - Cinema 1	NO (-18%)	NO
0 - Admin Office 1	NO (-75%)	NO
1 - Bedroom 1	NO (-81%)	NO
1 - Bedroom 2	NO (-47%)	NO
1 - Bedroom 3	NO (-41%)	NO
1 - Bedroom 4	NO (-27%)	NO
1 - Bedroom 5	NO (-19%)	NO
1 - Bedroom 6	NO (-41%)	NO
1 - Bedroom 7	NO (-44%)	NO
1 - Bedroom 8	NO (-66%)	NO
1 - Bedroom 9	NO (-69%)	NO
1 - Bedroom 10	NO (-75%)	NO
1 - Bedroom 11	NO (-72%)	NO
1 - Bedroom 12	NO (-77%)	NO
1 - Bedroom 13	NO (-78%)	NO
1 - Bedroom 14	NO (-68%)	NO
1 - Bedroom 15	NO (-64%)	NO
1 - Bedroom 16	NO (-59%)	NO
1 - Bedroom 17	NO (-65%)	NO
1 - Bedroom 18	NO (-30%)	NO
1 - Bedroom 19	NO (-18%)	NO
1 - Bedroom 20	NO (-11%)	NO
1 - Bedroom 21	NO (-7%)	NO
1 - Bedroom 22	NO (-21%)	NO
1 - Bedroom 23	NO (-22%)	NO
1 - Bedroom 24	NO (-18%)	NO
1 - Bedroom 25	NO (-18%)	NO
1 - Bedroom 26	NO (-10%)	NO
1 - Bedroom 27	NO (-6%)	NO
1 - Bedroom 28	NO (-36%)	NO
1 - Bedroom 29	NO (-35%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1 - Dining Room 1	NO (-67%)	NO
1 - Lounge/Dining 1	NO (-23%)	NO
1 - Lounge/Dining 2	NO (-4%)	NO
1 - Med Store 1	N/A	N/A
1 - Nurse Base 1	N/A	N/A
1 - Quiet Lounge 1	NO (-70%)	NO
2 - Bedroom 1	NO (-60%)	NO
2 - Bedroom 2	NO (-62%)	NO
2 - Bedroom 3	NO (-58%)	NO
2 - Bedroom 4	NO (-60%)	NO
2 - Bedroom 5	NO (-60%)	NO
2 - Bedroom 6	NO (-60%)	NO
2 - Bedroom 7	NO (-60%)	NO
2 - Bedroom 8	NO (-57%)	NO
2 - Bedroom 9	NO (-59%)	NO
2 - Bedroom 10	NO (-59%)	NO
2 - Nurse Base 1	N/A	N/A
2 - Med Store 1	N/A	N/A
2 - Staff Room 1	NO (-80%)	NO
2 - Chef Office 1	N/A	N/A
2 - Dining 1	NO (-67%)	NO
2 - Lounge 1	NO (-83%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	3258	3258
External area [m ²]	4893	4893
Weather	SOU	SOU
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	1294	1537
Average U-value [W/m ² K]	0.26	0.31
Alpha value* [%]	29.58	14.58

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area Building Type

Retail/Financial and Professional Services
 Restaurants and Cafes/Drinking Establishments/Takeaways
 Offices and Workshop Businesses
 General Industrial and Special Industrial Groups
 Storage or Distribution
 Hotels
100 Residential Institutions: Hospitals and Care Homes
 Residential Institutions: Residential Schools
 Residential Institutions: Universities and Colleges
 Secure Residential Institutions
 Residential Spaces
 Non-residential Institutions: Community/Day Centre
 Non-residential Institutions: Libraries, Museums, and Galleries
 Non-residential Institutions: Education
 Non-residential Institutions: Primary Health Care Building
 Non-residential Institutions: Crown and County Courts
 General Assembly and Leisure, Night Clubs, and Theatres
 Others: Passenger Terminals
 Others: Emergency Services
 Others: Miscellaneous 24hr Activities
 Others: Car Parks 24 hrs
 Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	17.13	14.95
Cooling	1.13	2.37
Auxiliary	11.87	9.93
Lighting	15.25	11.55
Hot water	55.02	63.55
Equipment*	81.95	81.95
TOTAL **	100.4	102.36

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	12.47	11.99
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>12.47</i>	<i>11.99</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	81.43	89.17
Primary energy [kWh/m ²]	108.76	111.31
Total emissions [kg/m ²]	16.49	16.96

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
Actual	87.5	0	26.4	0	3	0.92	0	0.97	0	
Notional	63.7	0	20.6	0	1.9	0.86	0	----	----	
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
Actual	119.6	0	36	0	8.6	0.92	0	0.97	0	
Notional	116.9	0	37.8	0	8.7	0.86	0	----	----	
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	0	172.2	0	9.6	23.9	3.8	5	4	5	
Notional	0	332.4	0	21	14.9	0	4.4	----	----	
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	0.1	160.5	0	8.9	0	3.8	5	4	5	
Notional	0	145	0	9.2	0	0	4.4	----	----	
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
Actual	0.5	0	0.2	0	121.9	0.92	0	0.97	0	
Notional	0.6	0	0.2	0	49.5	0.86	0	----	----	
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
Actual	0	0	0	0	12.6	0	0	0	0	
Notional	0	0	0	0	7.9	0	0	----	----	
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
Actual	10.8	0	3.3	0	17.7	0.92	0	0.97	0	
Notional	10.9	0	3.5	0	21.9	0.86	0	----	----	

Key to terms

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

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