

## **Carbon and Energy Statement**

**(In Accordance with Approved Document Part L1 2021)**

### **Starmount Villa Residential Care Home**

**Site Address:**

Starmount Villa Residential Care Home, Browns Road, Bradley Fold, Bolton, BL2 6RG

**Architect:**

Thorp Design Services Ltd

**Client:**

Mr Harry Swinnerton

**Project Reference:**

2627/035

**Date:**

03<sup>rd</sup> August 2026

**DSM Assessor:**

Matthew Jones (BSc Hons, OCDEA)

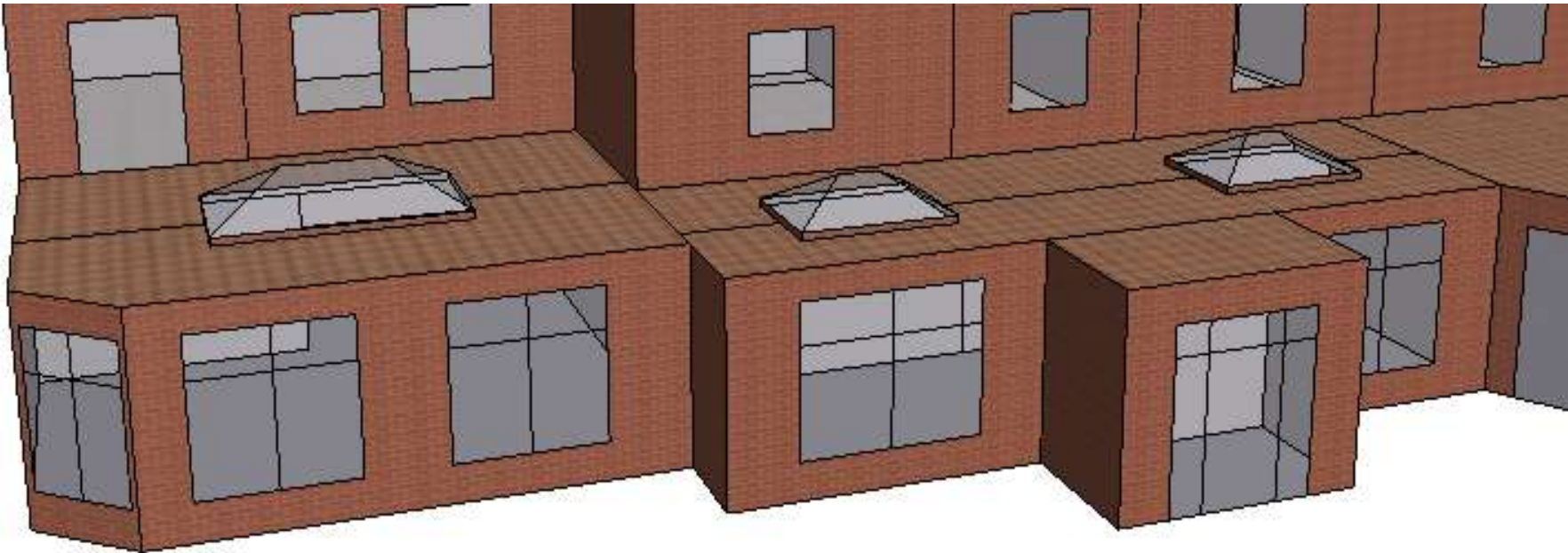
**Robmar Energy Solutions**

Robmar, 321 Manchester Road, Blackrod, Bolton, BL6 5BE

Tel: 07922986981

Email: [info@robmarenergysolutions.co.uk](mailto:info@robmarenergysolutions.co.uk)

DSM Model



Revision Record

| Revision Table |      |          |                    |
|----------------|------|----------|--------------------|
| Rev            | Date | Initials | Summary of Changes |
|                |      |          |                    |
|                |      |          |                    |

| Document Control Sheet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Report Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Starmount Villa</b>    |
| Report Revision                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1                         |
| Issue Purpose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Planning Submission Issue |
| Report Prepared For:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -                         |
| Report Author:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                         |
| Date of Issue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 03.08.2026                |
| Date of Revised Issue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | -                         |
| Disclaimer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |
| <p>The contents of this report are based on drawings, specifications, and information provided, supplemented by assumptions made to achieve compliance.</p> <p>We bear no responsibility to third parties for any use or interpretation of this report. Third parties act on the report's contents at their own risk.</p> <p>The use of this report is exclusively reserved for the named client only, unless accompanied by a signed letter of reliance.</p> <p>This report has been produced to support a Planning Application. It should not be relied upon at construction stage, for Building Control compliance, or to be used in the discharge of Planning Conditions.</p> |                           |

## 1 Executive Summary

We have been commissioned to undertake an Energy and Carbon Statement on a proposed single storey extension to an existing residential home located at Browns Road, Bradley Fold, Bolton BL2 6RG

The description of development is:  
proposed single storey extension to an existing residential home at Starmount Villa Residential Care Home located at Browns Road, Bradley Fold, Bolton BL2 6RG.

This document illustrates a reduction in CO<sub>2</sub> emissions via:

### Energy Efficiency – *Be Lean*

- U-Values have been set to maximise fabric efficiency and reduce energy demand
- Double Glazing has been specified.

### Decentralised Energy – *Be Clean*

A feasibility review for the scheme to connect to decentralised energy sources has been undertaken:

The result of this has identified that the proposed extension will utilise the existing Heating systems which are already in place within the development.

### Renewable Energy – *Be Green*

A review of the most appropriate low and zero carbon technologies has been Conducted, the outcome of this is that the developer will utilise a fabric first Approach and utilise the existing heating and hot water systems to minimize The upfront embodied carbon associated with install and commissioning of new Systems.



Figure: Proposed Site Plan

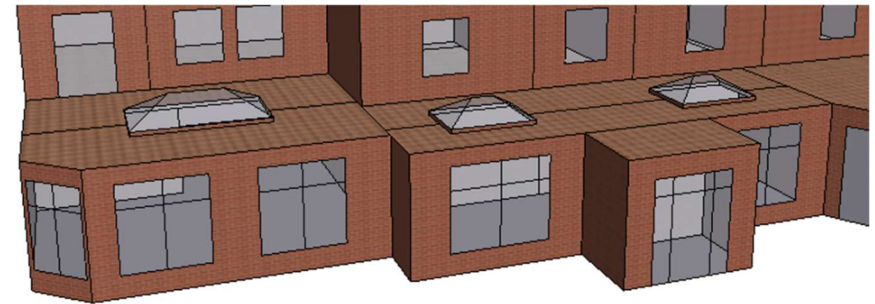


Figure: IES Model

## 2 Policy Framework

The proposed development is classified as a minor development.

### 2.1 National Planning Policy Framework (NPPF) (2024)

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

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

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

**(164)** – New development should be planned for in ways that:

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

**(165)** – To help increase the use and supply of renewable and low carbon energy and heat, plans should:

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

**(166)** – In determining planning applications, local planning authorities should expect new development to:

- a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of

development involved and its design, that this is not feasible or viable; and

b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

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

a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and give significant weight to the benefits associated with renewable and low carbon energy generation and the proposal's contribution to a net zero future;

b) recognise that small-scale and community-led projects provide a valuable contribution to cutting greenhouse gas emissions;

c) in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site.

**(169)** – Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas.

## 2.2 Local Planning Policy Framework

The Development Plan for Bury Council comprises the following key documents:

- Bury Unitary Development Plan – August 1997
- Places for Everyone Plan for Greater Manchester (adopted March 2024)

Together, these documents form the statutory and strategic planning framework guiding sustainable design, energy efficiency, and carbon reduction within the borough. Consideration to the emerging Bury Local Plan (adopted March 2025) is also referenced within this section.

### **Bury Unitary Development Plan – August 1997**

The Bury Unitary Development Plan (UDP) acts as a guide for the future development or protection of land in the Borough and together with other adopted Development Plan Documents its policies and proposals form the basis for the Council's decisions on planning applications.

The current Bury UDP was adopted by the Council on 29th August 1997. The Council is now working to replace the adopted UDP with a new document called the Bury Local Plan. Until the new Local Plan is produced the UDP will continue be used to make planning decisions

### **EN4/2 - Energy Efficiency**

The Council will encourage energy efficiency in development proposals through:

- The promotion of energy-efficient modes of transport such as walking, cycling and public transport;
- Seeking the location of new development in areas easily accessible to public transport and local facilities;
- Promoting the efficient use of energy in the design and layout of development.

Justification:

Land use planning has an important role to play in encouraging energy efficiency by guiding and controlling the location and form of development that takes place.

A main aim of Government advice is to control the level of harmful gas emissions generated by motor vehicles. This policy therefore aims to guide new development to locations which reduce the need for car journeys, and the distances driven, whilst being accessible to public transport. This will involve ensuring that developments make full and effective use of land within the existing urban area, whilst avoiding town cramming, and are located close to the public transport network, including the Metrolink system and bus services. Other forms of transport, such as cycling, are also to be encouraged.

Planning policies can also encourage energy efficiency through the way in which development is designed and built, for example through the orientation of dwellings, the use of energy saving measures in the lighting, heating and insulation of buildings, and the use of environmentally friendly and non-pollutant materials. Whilst the Council is keen to encourage measures which increase energy efficiency, it will also be important to ensure that their design and appearance does not detract from the visual amenity of the surrounding area.

## Places for Everyone Plan for Greater Manchester – Adopted March 2024

The Joint Places for Everyone (PfE) Development Plan Document was adopted by Bury Council with effect from 21 March 2024 and supersedes some of the UDP policies:

**JP-S 1 – Sustainable Development** - Establishes that development across Greater Manchester should contribute to sustainable growth and respond to the climate emergency, promoting energy-efficient, low-carbon, and resilient design.

**JP-S 2 – Carbon and Energy** - Requires all new development to minimise energy demand, maximise energy efficiency, use low-carbon and renewable energy, achieve substantial CO<sub>2</sub> reductions beyond Building Regulations, and support the 2038 Net Zero target.

**JP-S 3 – Infrastructure Provision and Transport** - Promotes energy-efficient transport, sustainable travel, and infrastructure that supports carbon reduction (e.g., EV charging, heat networks).

**JP-S 4 – Green Infrastructure** - Requires integration of green and blue infrastructure to support carbon sequestration, microclimate control, and climate adaptation.

**JP-S 5 – Climate Change and Resource Efficiency** - Requires development to mitigate/adapt to climate change, maximise energy efficiency, and use renewable/low-carbon technologies, sustainable materials, and water efficiency.

**JP-S 6 – Clean Air, Water and Environmental Quality** - Promotes energy-efficient, low-pollution design and aims to reduce emissions while improving environmental quality.

**JP-P 1 – Sustainable Places** - Encourages design and layouts that support sustainable lifestyles, efficient resource use, and reduced carbon footprints.



## Places for Everyone

Joint Development Plan Document for Bolton,  
Bury, Manchester, Oldham, Rochdale, Salford,  
Tameside, Trafford and Wigan  
2022 - 2039

Adopted **21 March 2024**

## **Bury Local Plan – adopted March 2025**

The Council is now working to replace the adopted UDP with a new document called the Bury Local Plan. Extracts of key relevant policies are found below:

### **Policy LP-CC1: Climate change**

The Council will take a proactive approach in ensuring that the Borough is resilient and adaptive to the cause and effects of climate change. In particular, the Council will seek to:

- a. Ensure that new and existing development minimises emissions and maximises the use of renewable energy and resources;
- b. Maximise opportunities to encourage modal shift in transportation from private car use to accessible active travel and sustainable transport such as walking, wheeling, cycling and public transport;
- c. Achieve a step change in new housing development design to deprioritise the car and to prioritise space for pedestrians, safe play and cycling;
- d. Maintain a comprehensive network of green and blue infrastructure and secure the provision of new green infrastructure in association with new development;
- e. Achieve high standards of sustainable design and construction in order to mitigate the effects of climate change;
- f. Reduce energy consumption in new buildings through the promotion of sustainable design and layout;
- g. Recognise the importance of the use of recycled and low embodied carbon materials;
- h. Support opportunities for appropriate renewable and low carbon energy generation;
- i. Ensure that new development is not subject to unacceptable levels of flood risk, does not result in increased flood risk elsewhere and, where possible, achieves reductions in flood risk overall;
- j. Encourage the incorporation of climate change adaptation measures within the design and layout of new development; and
- k. Promote water efficiency

### **Policy LP-W2: Sustainable Drainage**

The Flood and Water Management Act 2010 introduced new responsibilities for the Council relating to the approval of proposed drainage systems in new development redevelopments, subject to certain thresholds and exemptions, having regard to minimum national standards. The following policy should be read in conjunction with these statutory requirements.

All applications must be supported by a strategy for surface and foul water management. Surface water must be discharged in the following order of priority, recognising that a combination of measures within the hierarchy may be required to satisfactorily deal with all surface water:

An adequate soakaway or some other form of infiltration system;

An attenuated discharge to a surface water body;

An attenuated discharge to public surface water sewer, highway drain or another drainage system; and

An attenuated discharge to public combined sewer.

Proposals must be designed to maximise the retention of surface water on-site and minimise the volume, and rate of, surface water discharge offsite. On greenfield sites, any rate of discharge shall be restricted to a greenfield run-off rate. On previously developed land, applicants must also follow the hierarchy for surface water management and target a reduction to a greenfield rate of run-off. Proposals on previously developed land must achieve a minimum reduction in the rate of surface water discharge of 40% rising to a minimum of 55% in any critical drainage area identified by the SFRA. This rate may increase to 70% in areas of higher flood risk. Relaxation of this standard will be at the discretion of the Lead Local Flood Authority

To demonstrate any reduction, applicants must submit clear evidence of existing operational connections from the site with associated calculations on rates of discharge. Where clear evidence of existing connections is not provided, applicants will be required to discharge at a greenfield rate of run-off. All drainage design submissions must include a full set of design calculations and, where appropriate, a plan indicating exceedance flow paths to demonstrate the potential impacts of more extreme storm events on the development.

The design of proposals must assess and respond to the existing hydrological characteristics of a site to ensure a flood resilient design is achieved and water / flooding is not deflected or constricted. Design proposals should comply with “Greater Manchester’s Sustainable Drainage Design Guide for Streets. Streets for All Supplementary Technical Guidance”.

Applications for major development will be required to incorporate sustainable drainage, which is multi-functional, in accordance with the four pillars of sustainable drainage, in preference to underground piped and tanked storage systems, unless there is clear evidence why such techniques are not possible. The sustainable drainage should be integrated with the landscaped environment and the strategy for biodiversity net gain.

For any development proposal which is part of a wider development / allocation, foul and surface water strategies must be part of a holistic sitewide strategy. Pumped drainage systems must be minimised and a proliferation of pumping stations on a phased development will not be acceptable.

Applications must be accompanied by a drainage management and maintenance plan including a plan for any watercourse within the application site or an adjacent watercourse where the application site is afforded riparian rights. Proposals shall be submitted for approval by the Lead Local Flood Authority. It is not acceptable to burden individual property owners with riparian responsibilities. This should be reflected in the management plan for watercourses.

### 3 Energy Calculations – Be Lean

#### 3.1 Energy Calculations

To estimate the CO<sub>2</sub> emissions for the site, SBEM calculations have been carried out by an accredited NDEA Non-Domestic Energy Assessor using IES VE 2025.

The baseline CO<sub>2</sub> emissions covered by Part L 2021 of the Building Regulations are expressed as the Target Emission Rate (TER) and the proposed actual emissions are the Building Emission Rate (BER). These use the unit of measurement of kilograms of CO<sub>2</sub> per square-metre per annum (kg/CO<sub>2</sub>/m<sup>2</sup>). To calculate the overall proposed emissions, these figures can be multiplied by the size of the total floor area and/or site and this figure is presented in tonnes/annum. These are the figures expressed within this report.

This covers regulated carbon emissions from:

- Heating (and Cooling)
- Hot Water
- Lighting
- Auxiliary (Pumps and Fans)

#### 3.2 Passive Design Measures

Passive measures utilised in the concept and development of the design include:

- High levels of insulation more than the Part L 2021 notional values.
- Through good design, air infiltration will be minimised.
- Where possible, orientation and site layout to reduce energy demand.
- Provision of cross-ventilation.
- A high-performance glazing system to reduce heat demand and increase solar gains.

| Element                              | Part L2<br>Limiting U-Vales | Proposed U-Values<br>(W/m²K) |
|--------------------------------------|-----------------------------|------------------------------|
| Walls                                |                             |                              |
| External Wall                        | 0.18 W/m²K                  | 0.16 W/m²K                   |
| Floors                               |                             |                              |
| Ground Floor                         | 0.18 W/m²K                  | 0.16 W/m²K                   |
| Roof                                 |                             |                              |
| Flat Roof                            | 0.15 W/m²K                  | 0.15 W/m²K                   |
| Openings                             |                             |                              |
| Windows / roof windows               | 1.4 W/m²K                   | 1.4 W/m²K                    |
| Front Door                           | 1.4 W/m²K                   | 1.4 W/m²K                    |
| Air Permeability                     |                             |                              |
| N/A                                  |                             |                              |
| Thermal Bridging                     |                             |                              |
| N/A                                  |                             |                              |
| Table: Proposed Fabric Specification |                             |                              |

### 3.3 Active Design (Non- Residential)

The development will incorporate efficient building services to limit carbon emissions, including a zero-NO<sub>x</sub> heating system, smart metering and the following measures:

| Element                                                 | Proposed Details                       |
|---------------------------------------------------------|----------------------------------------|
| Ventilation                                             | Local extract ventilation to wet rooms |
| Ventilation Details                                     | Enhanced SFP                           |
| Heating                                                 | Existing gas boilers to be utilised.   |
| Heating Controls                                        | Programmer and room thermostat         |
| Heat Emitters                                           | Radiators                              |
| Hot Water                                               | Cylinder                               |
| Lighting                                                | LED                                    |
| Cooling                                                 | No                                     |
| WWHRS                                                   | No                                     |
| Table: Proposed Mechanical and Electrical Specification |                                        |

### 3.4 Lighting

In-line with exceeding Part L minimum requirements, all light fittings should be Light Emitting Diodes (LEDs) with a luminous efficiency per circuit watt of at least 120 lumens/Watt.

Occupancy sensors and daylight dimming should be specified in communal areas where appropriate.

### 3.5 Unregulated Emissions (Non-Residential)

Unregulated energy use and their carbon emissions are from systems or processes that are harder to quantify than regulated emissions which are from fixed systems.

Unregulated energy is not counted within SBEM for the purpose of Part L compliance. This is because the emissions from these items are variable and dependent on occupant behavior and specification i.e. different levels of White Good provision and use and amount of small power equipment used.

For the proposed occupants' units, unregulated emissions consist of:

- Equipment (Small Power devices)
- Tea making facilities
- External Lighting
- Appliances

Appliances and white goods can use significant amounts of energy in a building. This energy use becomes relatively more important in low energy buildings where passive design and low-flow fittings have reduced demand from space heating and hot water. High efficiency appliances are recommended to limit total energy consumption and minimise overheating risk from waste energy given off as heat.

## Decentralised Energy – *Be Clean*

In the context of the Bury Local plan and PFE policies, decentralised energy refers to low- and zero-carbon power and/or heat generated and delivered within the local area. This includes on-site heat networks and energy centers, through to large-scale district heat networks.

The national Heat Map displays connections to heat networks within Greater Manchester including both operational and future connections as well as displaying areas designated as Heat Network Priority Areas.



Analysis has found that no existing heat networks are in close proximity to the site.

## Renewable Energy – Be Green

Renewable Energy is typically defined as:

*“Energy derived from a source that is continually replenished, such as wind, wave, solar, hydroelectric and energy from plant material, but not fossil fuels or nuclear energy. Although not strictly renewable, geothermal energy is generally included.”*

As per Renewable Energy Directive (2018/2001/EU) aerothermal and hydrothermal technologies are also officially included within the definition.

Based on recent legislation including the *Clean Air Act* and *The Future Homes and Buildings Standards: 2023 consultation* as well as the location of the scheme, the following technologies have been discounted and are not discussed further:

- Wind Turbines
- Hydropower / Wave Technology
- Biogas / Biofuel / Biomass
- Hydrogen
- Hybrid Heat Pumps

The feasibility of remaining renewable and low carbon technologies has been undertaken based on the following parameters:

1. Practicality of installation of the technology
2. Energy demand profile for the project
3. Environmental impact & land use
4. Economic feasibility and overall payback (including available financial incentives)
5. Planning and regulatory issues i.e. conservation and heritage areas and aspects
6. Noise & aesthetic considerations

It should be noted that due to decarbonisation and the decrease in carbon factors for electricity, factors such as energy security and lowering running costs are deemed equal or more important to that of the offset of CO<sub>2</sub>.

| Non-Chosen Technologies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solar Hot Water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>Solar Hot Water can provide free hot water to a building, mainly during the summer months thus it requires a high hot water demand to be at its most effective and offer a sufficient payback. However, when the building is heated by a renewable source like an ASHP, this reduces the renewable energy generated due to an overlap in provision.</p> <p>To avoid high pipework heat losses, it is recommended that pipe runs are as small as possible so usually the technology is recommended for buildings with low usage patterns. The system requires a dedicated hot water cylinder or a dual cylinder.</p> <p>For this project, while not unviable, other technologies are preferred to achieve higher levels of carbon reduction within a quicker payback period and the height of the building is sensitive.</p>                                                                                                                                                                                                                                  |
| Exhaust Air Heat Pumps & Hot Water Heat Pumps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>Hot Water Heat Pumps (HWHP) are essentially hot water cylinders integrated with a small heat pump to raise the efficiency of the system above the 1 of a standard electric cylinder. This provides domestic hot water at efficiencies above that of an ASHP (as the pump is dedicated for the Hot Water) when it comes to hot water generation.</p> <p>As they do not provide any contribution towards heating, they are best suited for projects where there is both limited external spaces, a higher hot water than heating demand.</p> <p>Exhaust Air Heat Pumps (EAHP) are similar but provide heating, hot water and ventilation in a large all-internal unit. However, these are suited to Passivhaus style developments or small units as the units have a very low heat output (&lt;2kW) so if not, need to be supplemented with electric panel heaters. They also have noise considerations and ease-of-maintenance is unknown as a new technology in England.</p> <p>Based on the proposed scheme neither of these technologies are suitable.</p> |

## Ground Source Heat Pumps

Ground Source Heat Pumps (GSHP) differ from Air Source Heat Pumps in that they draw their heat from the ground rather than the air. This allows for both a more consistent temperature and higher efficiency given that in the winter months, the ground is warmer than the air. This allows the running costs of the system to be lower, although maintenance costs are higher.

To install a GSHP, you either need to install a ground-loop (*slinky*) system or to have deep boreholes installed during the piling phase of the scheme. The introduction of boreholes comes at significant capital cost, especially for schemes where raft or strip foundations are proposed so unless a significant amount of land is available then this can make the capital cost prohibitive.

Ground source heat pumps (GSHPs) are not considered well suited to this development, with variable refrigerant flow (VRF) systems being the preferred technology. GSHPs are typically better suited to larger buildings with higher heating demands, as they offer greater kW output than air source heat pumps. They are also generally more appropriate for secluded, detached properties where the associated external infrastructure and visual impact can be more easily accommodated. Given the nature and layout of the proposed development, VRF systems and other alternative technologies are considered more appropriate.

*Table: Renewable Energy Feasibility*



Figure: Proposed Elevations

### Air Source Heat Pumps (VRF)

Variable Refrigerant Flow (VRF) systems are highly efficient heat pump systems that transfer heat between indoor and outdoor units using refrigerant. Rather than generating heat directly,

VRF systems move heat from the external air into the building during heating mode and remove heat from the building during cooling mode. A compressor circulates refrigerant through a network of pipes to multiple indoor units, with the amount of refrigerant supplied to each unit varying according to the heating or cooling demand of individual spaces. The refrigerant readily changes between liquid and gaseous states, absorbing heat during evaporation and releasing heat during condensation. This enables the system to provide efficient, responsive heating and cooling while allowing independent temperature control across different zones within a building.

*Table: Renewable Energy Feasibility*

### Solar PV

- A PV system can generate a significant amount of electricity, estimated at around 900 – 1,000 kWh annually (based on average UK solar irradiance). This can offset a large portion of the running costs and based on current UK energy prices would be circa £250 per year per kWp.
- Landlords can take advantage of the Smart Export Guarantee (SEG) for kWh of energy generated that is not used on-site. Under the SEG, a monetary payment is earned per kWh by exporting surplus solar energy generated back to the grid, especially during the summer months where-by there will be high generation and low demand.
- Installing a PV system actively contributes to the UK's renewable energy targets and reduces its carbon footprint, helping to combat climate change in-line with the UK's commitment to reach net-zero emissions by 2050.

*Table: Renewable Energy Feasibility*

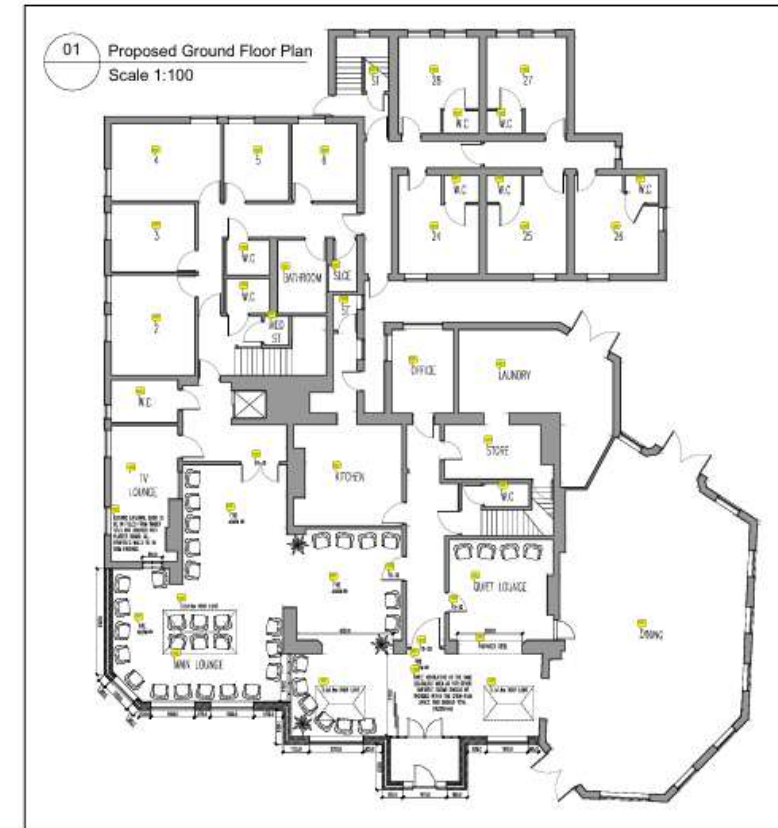


Figure: Proposed GF Plan

### Feasibility Conclusion

A review of the most appropriate low and zero carbon technologies has been Conducted, the outcome of this is that the developer with utilise a fabric first approach and utilise the existing heating and hot water systems to minimise the upfront embodied carbon associated with install and commissioning of new systems.

4 Results

| Starmount Villa Residential Care Home - Browns Road, Bradley Fold, Bolton BL2 6RG |                                                                                   |                                    |                                                        |                                    |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------|------------------------------------|
|                                                                                   | Carbon Dioxide Emissions for Non-Residential building (Kg CO <sub>2</sub> / year) | Percentage improvement on Part L2A | Building Emission KgCO <sub>2</sub> /yr/m <sup>2</sup> | Percentage improvement on Part L2A |
| Part L 2021<br>Baseline Assessment                                                | 89,888                                                                            | -                                  | 82.24                                                  | -                                  |
| Part L 2021<br>Proposed Assessment                                                | 89,779                                                                            | 2 %                                | 82.14                                                  | 2 %                                |
|                                                                                   |                                                                                   | 2 %                                |                                                        | 2%                                 |

Overall, the proposed extension at Starmount Residential Home demonstrates a measurable improvement in carbon performance when compared with the notional building model. Enhanced fabric performance through improved U-values, together with the specification of highly efficient LED lighting that exceeds the minimum limiting standards, contributes to further reductions in operational carbon emissions. As a result, the development represents a sustainable and energy-efficient design that aligns with the objectives of current Building Regulations and supports wider environmental and planning policy aspirations, and the scheme should be received favorably by the Local Planning Authority.

## 5 Sustainability Measures

### 5.1 Materials

#### Green Guide to Specification

When considering minimising the environmental impact of materials, this requires the specification of materials with a low environmental impact across their lifetime. The BRE's Green Guide rating system focuses on the major building element build ups of the roof, external walls, internal walls, upper and ground floor and windows and rates each element from A+ to E across a range of environmental factors.

#### Main Construction Materials & Timber – Responsible Sourcing

All timber products used on the project, including site as well as construction timber, will be legally harvested and traded timber. No products used in the development should be included on the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) list. These should be procured from suppliers and manufacturers who can provide full Chain of Custody certification for their corresponding products, i.e. PEFC or FSC.

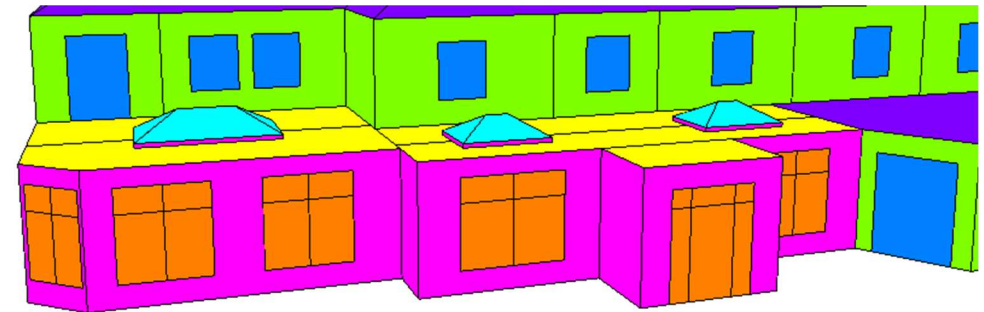
For all other materials, BES:6001 and ISO:14001 certification will be sought.

#### Insulation

The insulation for the scheme has been generally specified as Mineral Wool or such based variants. Benefits of such insulation is:

- Offers ever decreasing thermal conductivity with new product launches.
- Achieves an A+ rating as per the BRE Green Guide.
- All major manufacturers are ISO:14001 and BES:6001 compliant.
- Has zero ozone depletion potential (ODP) and global warming potential (GWP).
- Possesses BBA certification and;
- Compliant with Part B of the Building Regulations.

- Extension Floor (STD\_FLO2)
- Extension Roof (STD\_ROO1)
- Extension Roof Windows (STD\_RFLT)
- Extension Walls (STD\_WAL2)
- Extension Windows (STD\_EXT1)



*IES – Model image of proposed construction areas for the extension*



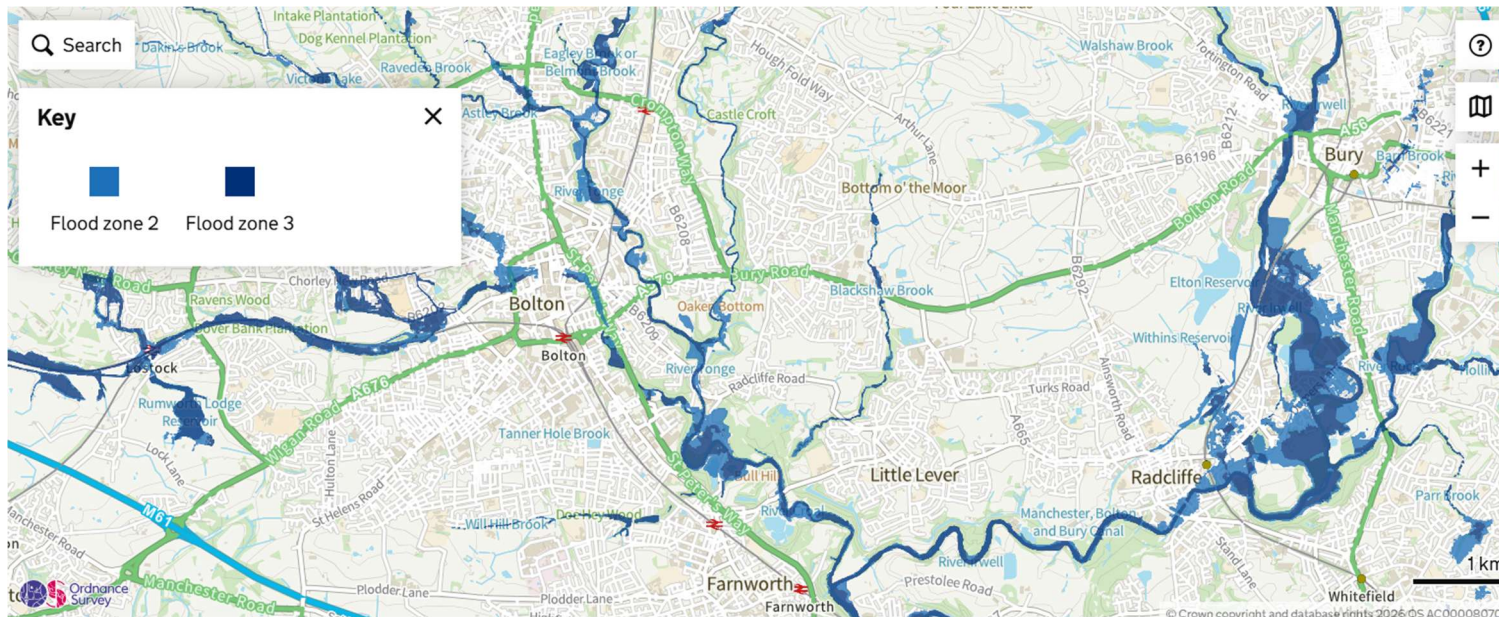
The proposed development comprises the extension to an existing building. The proposed extension would sit within the existing site boundary and therefore a SUDS assessment is not Deemed necessary.

As the development is wholly contained within the existing site boundary, there will be no changes to the existing surface water drainage arrangements, foul drainage network, ground levels, or site layout. The proposed works will not result in any increase in surface water runoff or alter the rate or volume of discharge from the site.

Given the nature of the proposals, there is no requirement for new Sustainable Drainage Systems (SuDS) to be incorporated, as no additional hard standing or impermeable surfaces are being created. The existing drainage infrastructure serving the building will remain in place and continue to operate as existing, with no adverse impact on the capacity or performance of the local drainage network.

Similarly, the proposals do not alter the site's flood risk characteristics. The development will not increase flood risk on-site or elsewhere, nor will it affect overland flow paths, flood storage capacity, or existing drainage infrastructure. As such, the proposal is considered to have a neutral impact in terms of flood risk and drainage.

In light of the above, it is considered that a site-specific Flood Risk Assessment and a Sustainable Drainage Strategy are not required for this application. The proposals represent the reuse of an existing building with no material changes to the site's drainage characteristics or flood risk profile. Consequently, the development is consistent with national planning guidance and local planning policy objectives relating to flood risk and sustainable drainage, as it neither increases flood risk nor necessitates new drainage infrastructure.



Existing flood data for surrounding areas –  
 (<https://flood-map-forplanning.service.gov.uk/map?cz=374000.2,408983.4,13.602559>)

7 Conclusion

An energy assessment has been undertaken of the proposed scheme in-line with the energy hierarchy. These calculations illustrate a reduction in CO<sub>2</sub> emissions over the baseline of Part L via:

Energy Efficiency Measures (*Be Lean*)

- Thermal insulation is specified to achieve U-Values lower than the Part L 2021 notional.
- LED Lighting with high luminous efficacy (lm/W) will be provided to all fittings.
- Double Glazing

Decentralised Energy (*Be Clean*)

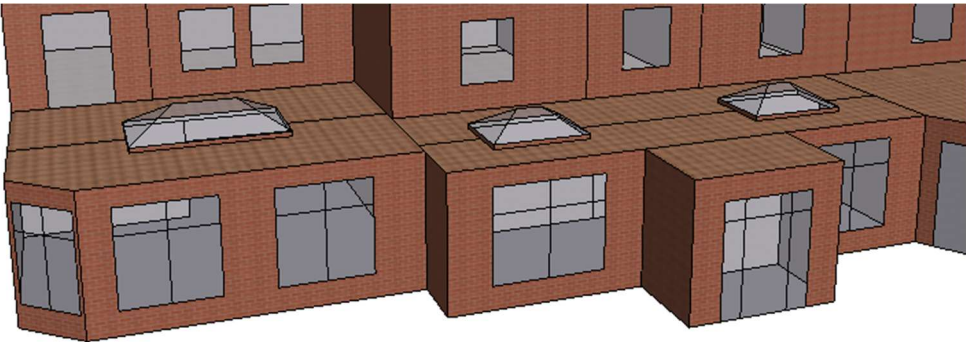
Following a review of the scheme, individual heating is proposed via the existing gas boilers.

Renewable Technologies (*Be Green*)

A feasibility analysis on renewable technologies has been undertaken, and the following systems are proposed for the scheme:

A review of the most appropriate low and zero carbon technologies has been Conducted, the outcome of this is that the developer with utilise a fabric first Approach and utilise the existing heating and hot water systems to minimize The upfront embodied carbon associated with install and commissioning of new Systems.

Overall, the proposed extension at Starmount Residential Home demonstrates a measurable improvement in carbon performance when compared with the notional building model. Enhanced fabric performance through improved U-values, together with the specification of highly efficient LED lighting that exceeds the minimum limiting standards, contributes to further reductions in operational carbon emissions. As a result, the development represents a sustainable and energy-efficient design that aligns with the objectives of current Building Regulations and supports wider environmental and planning policy aspirations, and the scheme should be received favorably by the Local Planning Authority.



IES – Model image of proposed extension

| Starmount Villa Residential Care Home - Browns Road, Bradley Fold, Bolton BL2 6RG |                                                                                   |                                    |                                                        |                                    |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------|------------------------------------|
|                                                                                   | Carbon Dioxide Emissions for Non-Residential building (Kg CO <sub>2</sub> / year) | Percentage improvement on Part L2A | Building Emission KgCO <sub>2</sub> /yr/m <sup>2</sup> | Percentage improvement on Part L2A |
| Part L 2021 Baseline Assessment                                                   | 89,888                                                                            | -                                  | 82.24                                                  | -                                  |
| Part L 2021 Proposed Assessment                                                   | 89,779                                                                            | 2 %                                | 82.14                                                  | 2 %                                |
|                                                                                   |                                                                                   | 2 %                                |                                                        | 2%                                 |

IES – Summary of results (Via SBEM calculations)

## Project name

**As Proposed****As designed**

Date: Sun Jul 26 17:37:43 2026

## Administrative information

## Building Details

Address: Starmount Villa Residential Care Home, Bolton,  
BL2 6RG

## Certifier details

Name: Northern Compliance

Telephone number: -

Address: -, -, -

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.31

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.31

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 546.54The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

|                                                                                       |                          |
|---------------------------------------------------------------------------------------|--------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum   | 39.71                    |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | 82.14                    |
| Target primary energy rate (TPER), kWh <sub>PE</sub> /m <sup>2</sup> annum            | 212.5                    |
| Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum          | 456.58                   |
| 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 <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.26                  | 1.46                 | 1.6                  | 00000000:Surf[3]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.18                  | 1.01                 | 1.2                  | 00000000:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.16                  | 0.74                 | 0.74                 | 01000000:Surf[4]                         |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.18                  | 1.14                 | 2                    | 00000011:Surf[1]                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.6                   | 2.08                 | 2.2                  | 00000000:Surf[1]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.2                   | 1.5                  | 1.5                  | 00000018:Surf[15]                        |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3                     | -                    | -                    | No high usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check.      *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m <sup>2</sup> K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |

| Air permeability                             | Limiting standard | This building |
|----------------------------------------------|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 8                 | 25            |

## Building services

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

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

### 1- Vaillant Eco Tec\_Rads\_Nat

|                                                                                                                                                                                                                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                           | 0.94               | -                  | 0.2                | -             | -             |
| 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                                                                                                                             |                    |                    |                    |               | NO            |
| * 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- Vaillant Eco Tec\_Rads\_Extract

|                                                                                                                                                                                                                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                           | 0.94               | -                  | 0.2                | -             | -             |
| 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                                                                                                                             |                    |                    |                    |               | NO            |
| * 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. |                    |                    |                    |               |               |

"No HWS in project, or hot water is provided by HVAC system"

### 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   |               |          |
| 00_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_Bathroom |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_Kitchen  |                   | 1.1 | -   | -   | -   | - | -   | -   | -   | 1.1 | -             | N/A      |
| 00_Laundry  |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_Bathroom |                   | 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 |
| 01_WC             | 0.3           | -   | -   | -   | - | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_Ensuite Bedroom 1                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 2                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 3                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 4                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 5                  |                | 50                | -                    | -                    |
| 00_Bedroom 1                          |                | 50                | -                    | -                    |
| 00_Bedroom 2                          |                | 50                | -                    | -                    |
| 00_Bedroom 3                          |                | 50                | -                    | -                    |
| 00_Bedroom 4                          |                | 50                | -                    | -                    |
| 00_Bedroom 5                          |                | 50                | -                    | -                    |
| 00_WC                                 |                | 50                | -                    | -                    |
| 00_WC                                 |                | 50                | -                    | -                    |
| 00_WC                                 |                | 50                | -                    | -                    |
| 00_Bathroom                           |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Stairs                             |                | 50                | -                    | -                    |
| 00_Stairs                             |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_TV Lounge                          |                | 50                | -                    | -                    |
| 00_Main Lounge                        |                | 50                | -                    | -                    |
| 00_Kitchen                            |                | 50                | -                    | -                    |
| 00_Quiet Lounge                       |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Office                             |                | 50                | -                    | -                    |
| 00_Store                              |                | 50                | -                    | -                    |
| 00_Laundry                            |                | 50                | -                    | -                    |
| 00_Dining                             |                | 50                | -                    | -                    |
| 00_Entrance                           |                | 120               | -                    | -                    |
| 00_Main Lounge                        |                | 120               | -                    | -                    |
| 00_Main Lounge                        |                | 120               | -                    | -                    |
| 01_Ensuite Bedroom 1                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 2                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 3                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 4                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 5                  |                | 50                | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                                   |
|---------------------------------------|----------------|-------------------|----------------------|-----------------------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m <sup>2</sup> ] |
|                                       | Standard value | 95                | 80                   | 0.3                               |
| 01_Bedroom 1                          |                | 50                | -                    | -                                 |
| 01_Bedroom 2                          |                | 50                | -                    | -                                 |
| 01_Bedroom 3                          |                | 50                | -                    | -                                 |
| 01_Bedroom 4                          |                | 50                | -                    | -                                 |
| 01_Bedroom 5                          |                | 50                | -                    | -                                 |
| 01_Bedroom 6                          |                | 50                | -                    | -                                 |
| 01_Bedroom 7                          |                | 50                | -                    | -                                 |
| 01_Bedroom 8                          |                | 50                | -                    | -                                 |
| 01_Bedroom 9                          |                | 50                | -                    | -                                 |
| 01_Bedroom 10                         |                | 50                | -                    | -                                 |
| 01_Bedroom 11                         |                | 50                | -                    | -                                 |
| 01_Bedroom 12                         |                | 50                | -                    | -                                 |
| 01_Bedroom 13                         |                | 50                | -                    | -                                 |
| 01_Bedroom 14                         |                | 50                | -                    | -                                 |
| 01_Bedroom 15                         |                | 50                | -                    | -                                 |
| 01_WC                                 |                | 50                | -                    | -                                 |
| 01_WC                                 |                | 50                | -                    | -                                 |
| 01_WC                                 |                | 50                | -                    | -                                 |
| 01_Office                             |                | 50                | -                    | -                                 |
| 01_Bathroom                           |                | 50                | -                    | -                                 |
| 01_WC                                 |                | 50                | -                    | -                                 |
| 01_Stairs                             |                | 50                | -                    | -                                 |
| 01_Stairs                             |                | 50                | -                    | -                                 |
| 01_Circ                               |                | 50                | -                    | -                                 |
| 01_Circ                               |                | 50                | -                    | -                                 |
| 01_Circ                               |                | 50                | -                    | -                                 |
| 01_Circ                               |                | 50                | -                    | -                                 |
| 01_Circ                               |                | 50                | -                    | -                                 |

**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? |
|----------------------|--------------------------------|-----------------------|
| 00_Ensuite Bedroom 1 | NO (-63.7%)                    | NO                    |
| 00_Ensuite Bedroom 2 | NO (-22.7%)                    | NO                    |
| 00_Ensuite Bedroom 3 | NO (-84.2%)                    | NO                    |
| 00_Ensuite Bedroom 4 | NO (-82.5%)                    | NO                    |
| 00_Ensuite Bedroom 5 | NO (-84.9%)                    | NO                    |
| 00_Bedroom 1         | NO (-41.9%)                    | NO                    |
| 00_Bedroom 2         | NO (-54.9%)                    | NO                    |
| 00_Bedroom 3         | NO (-65.9%)                    | NO                    |
| 00_Bedroom 4         | NO (-54.7%)                    | NO                    |
| 00_Bedroom 5         | NO (-38%)                      | NO                    |
| 00_TV Lounge         | NO (-55.4%)                    | NO                    |
| 00_Main Lounge       | N/A                            | N/A                   |

| Zone                 | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------|--------------------------------|-----------------------|
| 00_Quiet Lounge      | NO (-99.7%)                    | NO                    |
| 00_Office            | NO (-88.8%)                    | NO                    |
| 00_Dining            | NO (-27.6%)                    | NO                    |
| 00_Main Lounge       | YES (+59.6%)                   | NO                    |
| 00_Main Lounge       | YES (+30.9%)                   | NO                    |
| 01_Ensuite Bedroom 1 | NO (-19.4%)                    | NO                    |
| 01_Ensuite Bedroom 2 | NO (-62.2%)                    | NO                    |
| 01_Ensuite Bedroom 3 | NO (-81.1%)                    | NO                    |
| 01_Ensuite Bedroom 4 | NO (-73.8%)                    | NO                    |
| 01_Ensuite Bedroom 5 | NO (-74.9%)                    | NO                    |
| 01_Bedroom 1         | NO (-30.5%)                    | NO                    |
| 01_Bedroom 2         | NO (-51.4%)                    | NO                    |
| 01_Bedroom 3         | NO (-64.3%)                    | NO                    |
| 01_Bedroom 4         | NO (-52.8%)                    | NO                    |
| 01_Bedroom 5         | NO (-35.3%)                    | NO                    |
| 01_Bedroom 6         | NO (-60.5%)                    | NO                    |
| 01_Bedroom 7         | NO (-48.3%)                    | NO                    |
| 01_Bedroom 8         | NO (-83.9%)                    | NO                    |
| 01_Bedroom 9         | NO (-56.1%)                    | NO                    |
| 01_Bedroom 10        | NO (-68.9%)                    | NO                    |
| 01_Bedroom 11        | NO (-70.2%)                    | NO                    |
| 01_Bedroom 12        | NO (-75.9%)                    | NO                    |
| 01_Bedroom 13        | NO (-75.1%)                    | NO                    |
| 01_Bedroom 14        | NO (-82.9%)                    | NO                    |
| 01_Bedroom 15        | NO (-68.7%)                    | NO                    |
| 01_Office            | NO (-89.8%)                    | 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?                                 | NO  |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Floor area [m <sup>2</sup> ]                          | 1093.1  | 1093.1   |
| External area [m <sup>2</sup> ]                       | 2131    | 2057.9   |
| Weather                                               | MAN     | MAN      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 25      | 3        |
| Average conductance [W/K]                             | 3144.18 | 714.72   |
| Average U-value [W/m <sup>2</sup> K]                  | 1.48    | 0.35     |
| Alpha value* [%]                                      | 22.08   | 10       |

\* 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/m<sup>2</sup>]

|                 | Actual        | Notional     |
|-----------------|---------------|--------------|
| Heating         | 247.85        | 61.65        |
| Cooling         | 0             | 0            |
| Auxiliary       | 4.63          | 3.46         |
| Lighting        | 16.48         | 11.54        |
| Hot water       | 129.14        | 127.05       |
| Equipment*      | 59.62         | 59.62        |
| <b>TOTAL **</b> | <b>398.09</b> | <b>203.7</b> |

\* 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/m<sup>2</sup>]

|                              | Actual   | Notional  |
|------------------------------|----------|-----------|
| Photovoltaic systems         | 0        | 15        |
| Wind turbines                | 0        | 0         |
| CHP generators               | 0        | 0         |
| Solar thermal systems        | 0        | 0         |
| <i>Displaced electricity</i> | <i>0</i> | <i>15</i> |

## Energy & CO<sub>2</sub> Emissions Summary

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 748.41 | 200.92   |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 456.58 | 212.51   |
| Total emissions [kg/m <sup>2</sup> ]                | 82.14  | 39.71    |

| HVAC Systems Performance                                                                            |                   |                   |                    |                    |                   |               |               |                  |                  |  |
|-----------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|--|
| System Type                                                                                         | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |  |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 741.6             | 0                 | 245.6              | 0                  | 3.9               | 0.84          | 0             | 0.94             | 0                |  |
| Notional                                                                                            | 197.9             | 0                 | 60.7               | 0                  | 1.9               | 0.91          | 0             | ----             | ----             |  |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 823.3             | 0                 | 272.6              | 0                  | 12.1              | 0.84          | 0             | 0.94             | 0                |  |
| Notional                                                                                            | 234.3             | 0                 | 71.9               | 0                  | 8.1               | 0.91          | 0             | ----             | ----             |  |
| [ST] No Heating or Cooling                                                                          |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |  |
| Notional                                                                                            | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 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                                                                                   |

## Project name

As Notional

As designed

Date: Sun Jul 26 17:43:04 2026

## Administrative information

## Building Details

Address: Starmount Villa Residential Care Home, Bolton,  
BL2 6RG

## Certifier details

Name: Northern Compliance

Telephone number: -

Address: -, -, -

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.31

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.31

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 546.54The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

|                                                                                       |                          |
|---------------------------------------------------------------------------------------|--------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum   | 39.6                     |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | 82.24                    |
| Target primary energy rate (TPER), kWh <sub>PE</sub> /m <sup>2</sup> annum            | 211.21                   |
| Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum          | 458.41                   |
| 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 <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
|--------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Walls*                               | 0.26                  | 1.46                 | 1.6                  | 00000000:Surf[3]                         |
| Floors                               | 0.18                  | 1.02                 | 1.2                  | 00000000:Surf[0]                         |
| Pitched roofs                        | 0.16                  | 0.74                 | 0.74                 | 01000000:Surf[4]                         |
| Flat roofs                           | 0.18                  | 1.14                 | 2                    | 00000011:Surf[1]                         |
| Windows** and roof windows           | 1.6                   | 2.08                 | 2.2                  | 00000000:Surf[1]                         |
| Rooflights***                        | 2.2                   | 2.23                 | 2.23                 | 00000018:Surf[15]                        |
| Personnel doors^                     | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors            | 3                     | -                    | -                    | No high usage entrance doors in building |

U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

\* 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/m<sup>2</sup>K

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

| Air permeability                             | Limiting standard | This building |
|----------------------------------------------|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 8                 | 25            |

## Building services

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

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

### 1- Vaillant Eco Tec\_Rads\_Nat

|                                                                                                                                                                                                                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                           | 0.94               | -                  | 0.2                | -             | -             |
| 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                                                                                                                             |                    |                    |                    |               | NO            |
| * 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- Vaillant Eco Tec\_Rads\_Extract

|                                                                                                                                                                                                                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                           | 0.94               | -                  | 0.2                | -             | -             |
| 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                                                                                                                             |                    |                    |                    |               | NO            |
| * 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. |                    |                    |                    |               |               |

"No HWS in project, or hot water is provided by HVAC system"

### 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   |               |          |
| 00_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_Bathroom |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 00_Kitchen  |                   | 1.1 | -   | -   | -   | - | -   | -   | -   | 1.1 | -             | N/A      |
| 00_Laundry  |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_WC       |                   | 0.3 | -   | -   | -   | - | -   | -   | -   | -   | -             | N/A      |
| 01_Bathroom |                   | 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 |
| 01_WC             | 0.3           | -   | -   | -   | - | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_Ensuite Bedroom 1                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 2                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 3                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 4                  |                | 50                | -                    | -                    |
| 00_Ensuite Bedroom 5                  |                | 50                | -                    | -                    |
| 00_Bedroom 1                          |                | 50                | -                    | -                    |
| 00_Bedroom 2                          |                | 50                | -                    | -                    |
| 00_Bedroom 3                          |                | 50                | -                    | -                    |
| 00_Bedroom 4                          |                | 50                | -                    | -                    |
| 00_Bedroom 5                          |                | 50                | -                    | -                    |
| 00_WC                                 |                | 50                | -                    | -                    |
| 00_WC                                 |                | 50                | -                    | -                    |
| 00_WC                                 |                | 50                | -                    | -                    |
| 00_Bathroom                           |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Stairs                             |                | 50                | -                    | -                    |
| 00_Stairs                             |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_TV Lounge                          |                | 50                | -                    | -                    |
| 00_Main Lounge                        |                | 50                | -                    | -                    |
| 00_Kitchen                            |                | 50                | -                    | -                    |
| 00_Quiet Lounge                       |                | 50                | -                    | -                    |
| 00_Circ                               |                | 50                | -                    | -                    |
| 00_Office                             |                | 50                | -                    | -                    |
| 00_Store                              |                | 50                | -                    | -                    |
| 00_Laundry                            |                | 50                | -                    | -                    |
| 00_Dining                             |                | 50                | -                    | -                    |
| 00_Entrance                           |                | 95                | -                    | -                    |
| 00_Main Lounge                        |                | 95                | -                    | -                    |
| 00_Main Lounge                        |                | 95                | -                    | -                    |
| 01_Ensuite Bedroom 1                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 2                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 3                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 4                  |                | 50                | -                    | -                    |
| 01_Ensuite Bedroom 5                  |                | 50                | -                    | -                    |

| General lighting and display lighting |                       | General luminaire | Display light source |                                   |
|---------------------------------------|-----------------------|-------------------|----------------------|-----------------------------------|
| Zone name                             |                       | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m <sup>2</sup> ] |
|                                       | <b>Standard value</b> | 95                | 80                   | 0.3                               |
| 01_Bedroom 1                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 2                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 3                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 4                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 5                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 6                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 7                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 8                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 9                          |                       | 50                | -                    | -                                 |
| 01_Bedroom 10                         |                       | 50                | -                    | -                                 |
| 01_Bedroom 11                         |                       | 50                | -                    | -                                 |
| 01_Bedroom 12                         |                       | 50                | -                    | -                                 |
| 01_Bedroom 13                         |                       | 50                | -                    | -                                 |
| 01_Bedroom 14                         |                       | 50                | -                    | -                                 |
| 01_Bedroom 15                         |                       | 50                | -                    | -                                 |
| 01_WC                                 |                       | 50                | -                    | -                                 |
| 01_WC                                 |                       | 50                | -                    | -                                 |
| 01_WC                                 |                       | 50                | -                    | -                                 |
| 01_Office                             |                       | 50                | -                    | -                                 |
| 01_Bathroom                           |                       | 50                | -                    | -                                 |
| 01_WC                                 |                       | 50                | -                    | -                                 |
| 01_Stairs                             |                       | 50                | -                    | -                                 |
| 01_Stairs                             |                       | 50                | -                    | -                                 |
| 01_Circ                               |                       | 50                | -                    | -                                 |
| 01_Circ                               |                       | 50                | -                    | -                                 |
| 01_Circ                               |                       | 50                | -                    | -                                 |
| 01_Circ                               |                       | 50                | -                    | -                                 |
| 01_Circ                               |                       | 50                | -                    | -                                 |

**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? |
|----------------------|--------------------------------|-----------------------|
| 00_Ensuite Bedroom 1 | NO (-63.7%)                    | NO                    |
| 00_Ensuite Bedroom 2 | NO (-22.7%)                    | NO                    |
| 00_Ensuite Bedroom 3 | NO (-84.2%)                    | NO                    |
| 00_Ensuite Bedroom 4 | NO (-82.5%)                    | NO                    |
| 00_Ensuite Bedroom 5 | NO (-84.9%)                    | NO                    |
| 00_Bedroom 1         | NO (-41.9%)                    | NO                    |
| 00_Bedroom 2         | NO (-54.9%)                    | NO                    |
| 00_Bedroom 3         | NO (-65.9%)                    | NO                    |
| 00_Bedroom 4         | NO (-54.7%)                    | NO                    |
| 00_Bedroom 5         | NO (-38%)                      | NO                    |
| 00_TV Lounge         | NO (-55.4%)                    | NO                    |
| 00_Main Lounge       | N/A                            | N/A                   |

| Zone                 | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------|--------------------------------|-----------------------|
| 00_Quiet Lounge      | NO (-99.7%)                    | NO                    |
| 00_Office            | NO (-88.8%)                    | NO                    |
| 00_Dining            | NO (-27.6%)                    | NO                    |
| 00_Main Lounge       | YES (+59.8%)                   | NO                    |
| 00_Main Lounge       | YES (+31%)                     | NO                    |
| 01_Ensuite Bedroom 1 | NO (-19.4%)                    | NO                    |
| 01_Ensuite Bedroom 2 | NO (-62.2%)                    | NO                    |
| 01_Ensuite Bedroom 3 | NO (-81.1%)                    | NO                    |
| 01_Ensuite Bedroom 4 | NO (-73.8%)                    | NO                    |
| 01_Ensuite Bedroom 5 | NO (-74.9%)                    | NO                    |
| 01_Bedroom 1         | NO (-30.5%)                    | NO                    |
| 01_Bedroom 2         | NO (-51.4%)                    | NO                    |
| 01_Bedroom 3         | NO (-64.3%)                    | NO                    |
| 01_Bedroom 4         | NO (-52.8%)                    | NO                    |
| 01_Bedroom 5         | NO (-35.3%)                    | NO                    |
| 01_Bedroom 6         | NO (-60.5%)                    | NO                    |
| 01_Bedroom 7         | NO (-48.3%)                    | NO                    |
| 01_Bedroom 8         | NO (-83.9%)                    | NO                    |
| 01_Bedroom 9         | NO (-56.1%)                    | NO                    |
| 01_Bedroom 10        | NO (-68.9%)                    | NO                    |
| 01_Bedroom 11        | NO (-70.2%)                    | NO                    |
| 01_Bedroom 12        | NO (-75.9%)                    | NO                    |
| 01_Bedroom 13        | NO (-75.1%)                    | NO                    |
| 01_Bedroom 14        | NO (-82.9%)                    | NO                    |
| 01_Bedroom 15        | NO (-68.7%)                    | NO                    |
| 01_Office            | NO (-89.8%)                    | 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?                                 | NO  |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Floor area [m <sup>2</sup> ]                          | 1093.1  | 1093.1   |
| External area [m <sup>2</sup> ]                       | 2131    | 2057.9   |
| Weather                                               | MAN     | MAN      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 25      | 3        |
| Average conductance [W/K]                             | 3158.32 | 714.72   |
| Average U-value [W/m <sup>2</sup> K]                  | 1.48    | 0.35     |
| Alpha value* [%]                                      | 22.13   | 10       |

\* 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/m<sup>2</sup>]

|                 | Actual        | Notional     |
|-----------------|---------------|--------------|
| Heating         | 247.2         | 61.65        |
| Cooling         | 0             | 0            |
| Auxiliary       | 4.63          | 3.46         |
| Lighting        | 18.16         | 11.54        |
| Hot water       | 129.14        | 127.05       |
| Equipment*      | 59.62         | 59.62        |
| <b>TOTAL **</b> | <b>399.13</b> | <b>203.7</b> |

\* 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/m<sup>2</sup>]

|                              | Actual   | Notional     |
|------------------------------|----------|--------------|
| Photovoltaic systems         | 0        | 15.88        |
| Wind turbines                | 0        | 0            |
| CHP generators               | 0        | 0            |
| Solar thermal systems        | 0        | 0            |
| <i>Displaced electricity</i> | <i>0</i> | <i>15.88</i> |

## Energy & CO<sub>2</sub> Emissions Summary

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 746.46 | 200.92   |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 458.41 | 211.21   |
| Total emissions [kg/m <sup>2</sup> ]                | 82.24  | 39.6     |

| HVAC Systems Performance                                                                            |                   |                   |                    |                    |                   |               |               |                  |                  |  |
|-----------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|--|
| System Type                                                                                         | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |  |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 739.5             | 0                 | 244.9              | 0                  | 3.9               | 0.84          | 0             | 0.94             | 0                |  |
| Notional                                                                                            | 197.9             | 0                 | 60.7               | 0                  | 1.9               | 0.91          | 0             | ----             | ----             |  |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 823               | 0                 | 272.5              | 0                  | 12.1              | 0.84          | 0             | 0.94             | 0                |  |
| Notional                                                                                            | 234.3             | 0                 | 71.9               | 0                  | 8.1               | 0.91          | 0             | ----             | ----             |  |
| [ST] No Heating or Cooling                                                                          |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |  |
| Notional                                                                                            | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 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                                                                                   |