



**HODKINSON**



**Energy Statement**

Highgate Care Ltd

# **Former Mary Feilding Guild Care Home**

Final

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## DOCUMENT CONTROL RECORD

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Our emphasis is to provide innovative and cost-effective solutions that respond to increasing demands for quality and construction efficiency.

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## Executive Summary

The proposed development is to redevelop the Former Mary Feilding Guild Care Home to provide a new nursing and well-being and physiotherapy centre. The development is located in the London Borough of Haringey.

The Energy Strategy for the development has been formulated following The London Plan Energy Hierarchy: *Be Lean, Be Clean, Be Green* and *Be Seen*. The overriding objective in the formulation of the strategy is to maximise the reductions in CO<sub>2</sub> emissions through the application of this Hierarchy with a cost-effective, viable and technically appropriate approach and to minimise the emission of other pollutants. The energy strategy has been developed in consultation with London Borough of Haringey throughout the pre-application process.

The proposed development has been assessed under Part L 2013, utilising the SAP 10 carbon factors.

The development has achieved a 29.3% reduction in regulated CO<sub>2</sub> emissions through energy efficiency measures at the *Be Lean* stage.

In line with The London Plan, the feasibility of decentralised energy production as a *Be Clean* measure has been assessed. There are no existing or proposed heat networks for the development to connect to. A heat network has been proposed for the development, supplying heat from air source heat pumps and gas boilers. The specification of communal air source heat pump led heating system was agreed in principle with the Council's Climate Change Officer in pre-application discussions.

The full spectrum of *Be Green* renewable energy generating technologies has been considered. Solar photovoltaics and air source heat pumps are considered the most appropriate technologies. The development achieves a further 32.8% reduction in regulated CO<sub>2</sub> emission through the application of air source heat pumps and photovoltaics at the *Be Clean* and *Be Green* stages.

The proposed development is predicted to achieve an overall reduction of onsite regulated CO<sub>2</sub> emissions of 62.2%. This exceeds the 35% reduction in regulated CO<sub>2</sub> emissions required by the London Plan policy. This represents a high level of sustainable design and construction.

**Summary Table i: Mary Feilding Guild Care Home Carbon Dioxide Emissions and Savings after each stage of the Energy Hierarchy**

|                                       | Regulated CO <sub>2</sub> Emissions (kg/yr) | Unregulated CO <sub>2</sub> Emissions (kg/yr) | Savings Regulated CO <sub>2</sub> Emissions (kg/yr) | Reduction in CO <sub>2</sub> Emissions Achieved (%) |
|---------------------------------------|---------------------------------------------|-----------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| <b>Baseline</b>                       | 375,468                                     | 69,074                                        | -                                                   | -                                                   |
| <b>After <i>Be Lean</i> Measures</b>  | 265,270                                     | 69,074                                        | 110,198                                             | 29.3 %                                              |
| <b>After <i>Be Clean</i> Measures</b> | 144,280                                     | 69,074                                        | 120,990                                             | 32.2%                                               |
| <b>After <i>Be Green</i> Measures</b> | 142,008                                     | 69,074                                        | 2,272                                               | 0.6%                                                |
| <b>Cumulative On-Site</b>             | -                                           | -                                             | 233,460                                             | <b>62.2%</b>                                        |

In line with the GLA guidelines, a carbon offset payment is required achieve the Zero Carbon target. A regulated CO<sub>2</sub> emission of 142 tCO<sub>2</sub> emission will need to be offset over a 30-year period. The table below shows the estimated carbon offset payment for the development is expected to be £404,721

| <b>Table ii: Carbon Offset</b>                        |          |
|-------------------------------------------------------|----------|
| <b>Residual CO<sub>2</sub> (tCO<sub>2</sub>/year)</b> | 142.0    |
| <b>Carbon Price (£/t)</b>                             | £95      |
| <b>Carbon Offset Payment (£)</b>                      | £404,721 |

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## 1. INTRODUCTION

- 1.1** This Energy Statement has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, appointed by Highgate Care Ltd.
- 1.2** The Energy Strategy for the development has been formulated following The London Plan Energy Hierarchy: *Be Lean*, *Be Clean*, *Be Green* and *Be Seen*. The overriding objective in the formulation of the strategy is to maximise the reductions in CO<sub>2</sub> emissions through the application of this hierarchy with a cost-effective, viable and technically appropriate approach and to minimise the emission of other pollutants. This includes:
- > A *Be Lean* reduction with improved building fabric efficiency and M&E services;
  - > Considering *Be Clean* options;
  - > Providing renewable energy generation for the *Be Green* measures.
- 1.3** This statement first establishes a baseline assessment of the energy demands and associated CO<sub>2</sub> emissions for the development based on current Building Regulations Part L 2013. The report will then address sustainable energy measures that help achieve the project targets. The proposed measures are considered appropriate at this stage of the design, it would be expected that through detailed design subtle variations could be implemented to achieve the same goal.

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## 2. DEVELOPMENT OVERVIEW

- 2.1 The proposed development site at 103-107 North Hill in the London Borough of Haringey is located at Highgate, London N6 4DP, as shown in Figure 1 below.



Figure 1: Site Location – Map data © 2021 Google

- 2.2 The site measures 0.374 hectares and it is occupied by a series of five interlinked buildings which wrap around the site in an L shape. The current Mary Feilding Guid Care Home is a registered care home for the elderly. The building has the main frontage on to North Hill to the east and a back entrance with parking spaces on to View Road to the south-east.

## Proposed Development

### 2.3 The proposed development is described as follows:

*"Demolition of existing buildings and redevelopment to provide a new care home (Class C2 - Residential Institution), together with a well-being and physiotherapy centre. The proposed care home includes up to 70 bedrooms, a hydrotherapy pool, steam room, sauna, gym, treatment/medical rooms, hairdressing and beauty salon, restaurant, cafe, lounge, bar, well-being shop, general shop, car and cycle parking, refuse/recycling storage, mechanical and electrical plant, landscaping and associated works."*



Figure 2: Proposed Ground Floor Layout (DWA Architects, 2021)

### 3. RELEVANT PLANNING POLICY

- 3.1 The following planning policies and requirements have informed the sustainable design of the proposed development.

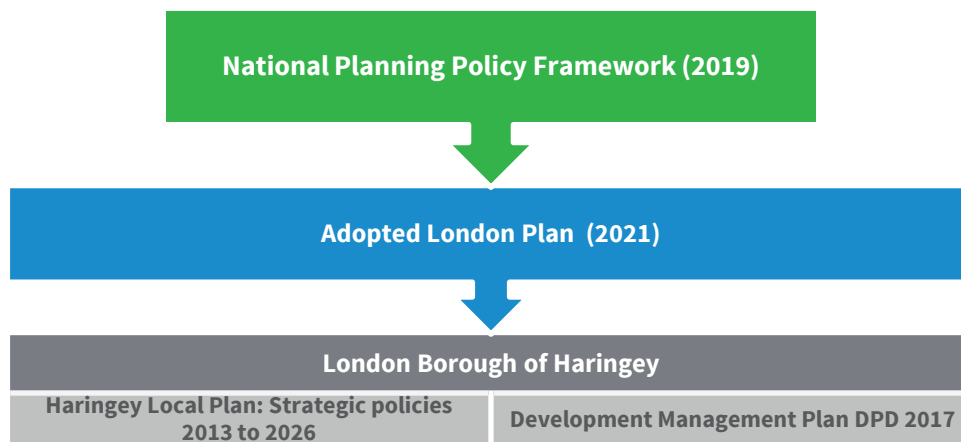


Figure 3: Relevant Planning Policy Documents

### National Policy: NPPF

- 3.2 The revised National Planning Policy Framework (NPPF) was published on the 20<sup>th</sup> July 2021 and sets out the Government's planning policies for England.
- 3.3 The NPPF provides a framework for achieving sustainable development, which has been summarised as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Resolution 42/187 of the United National General Assembly). At the heart of the framework is a presumption in favour of sustainable development.
- 3.4 The document states that the planning system has three overarching objectives which are interdependent and need to be pursued in mutually supportive ways:
- 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; and

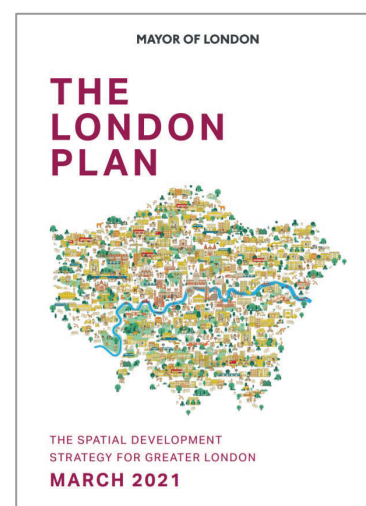
- c) **An environmental objective** – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate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

## Regional Policy: The London Plan

### The London Plan (2021)

- 3.5 The London Plan sets out an integrated economic, environmental, transport and social framework for the development of London. The following policies are considered relevant to the proposed development and this Statement:
- 3.6 Policy SI1 Improving Air Quality states that development should seek opportunities to identify and deliver further improvements to air quality. Where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site.
- 3.7 Policy SI2 Minimising Greenhouse Gas Emissions states that major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand. This means reducing greenhouse gas emissions in operation, and minimising both annual and peak energy demand in accordance with the following energy hierarchy:
- > *Be Lean*: Use less energy and manage demand during operation;
  - > *Be Clean*: Exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly;
  - > *Be Green*: Maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.
  - > *Be Seen*: Monitoring and reporting of the actual operational energy performance of major developments for at least five years.

A minimum on-site reduction of at least 35% beyond Building Regulations is required for major development. Residential development should achieve 10%, and non-residential development should achieve 15% through energy efficiency measures.'



**3.8 Policy SI3 Energy Infrastructure** states major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system. The heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

- a) Connect to local existing or planned heat networks;
- b) Use zero-emission or local secondary heat sources (in conjunction with heat pump, if required);
- c) Use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network);
- d) Use ultra-low NOx gas boilers.

**3.9 Policy SI4 Managing Heat Risk** states that major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the cooling hierarchy.

## GLA Energy Assessment Guidance

**3.10** The GLA Energy Assessment Guidance published April 2020 provides advice on how the energy statement can demonstrate compliance with the London Plan. The following key points have been taken from the document:

- > The GLA requires the use of SAP 10 carbon factors for referable schemes;
- > The London Plan, and requires the reduction in regulated CO<sub>2</sub> emissions of 10% for residential development and 15% for non-domestic development to be achieved at the *Be Lean* stage;
- > There is a requirement to report energy demands and improvements in carbon emissions.

## Local Policy: London Borough of Haringey

### Strategic Policies

**3.11** The London Borough of Haringey's Local Plan was adopted in 2013. The following policies are considered relevant to this Statement:

**3.12 Policy SP4- Working towards a low carbon Haringey** indicates that the following measures will be promoted to reduce carbon emissions from new and existing buildings.

- > All new residential development will achieve a minimum 25% reduction in total (regulated) CO<sub>2</sub> emissions. All new residential development shall be zero carbon from 2016 onwards;

- > From 2011 onwards all new non-residential development shall be built to at least BREEAM “very good” standard and should aim to achieve BREEAM “excellent”. All new non-residential development shall be zero carbon from 2019;
- > All developments should identify and implement, where viable, site-wide and area-wide decentralised energy facilities including the potential to link into a wider network;
- > Establish local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible;
- > All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from on-site renewable energy generation, which can include connections to local sources of decentralised renewable energy.

## Development Management DPD

- 3.13** This document gives effect to Haringey’s spatial strategy and the key objectives of the Strategic Policies Local Plan by supporting proposals that contribute to the delivery of sustainable development in accordance with the strategy. The following are the relevant policies:
- 3.14 Policy DM21- Sustainable Design, Layout and Construction** states that all new development will be expected to consider and implement sustainable design, layout and construction techniques. Proposal should apply the energy and cooling hierarchies to minimize energy use; maximise opportunities to enhance biodiversity on-site including via SuDS, living roofs and green walls; use building materials with high environmental performance ratings; and seek opportunities for locally sourced labour. Consideration will be given to the use of carbon offset payments.
- 3.15 Policy DM22- Decentralised Energy** states that subject to other policy requirements, proposals that contribute to the provision and use of Decentralised Energy network infrastructure will be supported.

## New Local Plan

- 3.16** The council has begun the process of preparing a New Local Plan which will replace the existing Local Plan documents adopted in July 2017. However, this plan is still in the early stages of consultation and a structured framework of guidance policies is yet to be developed.

## Summary of Planning Targets

- 3.17** The non-residential areas will aim to achieve a 15% reduction in regulated CO<sub>2</sub> emissions over Part L 2013, through energy efficiency measures in accordance with the New London Plan. This is calculated using SAP 10 carbon factor.
  - 3.18** The Development will target a 35% reduction in regulated CO<sub>2</sub> emissions over Part L 2013 for the residential and non-residential areas. In line with the energy hierarchy depicted in the London Plan.
  - 3.19** If possible the development will aim to achieve a 20% reduction in regulated CO<sub>2</sub> emissions with onsite renewable technologies, in line with the London Borough of Haringey policy.
  - 3.20** In line with the GLA guidelines, the development will need meet the zero carbon target. The shortfall in achieving the zero carbon target will be met through a cash-in-lieu payment. The London Borough of Haringey increased the carbon offset payment to £95 per tonne of CO<sub>2</sub> in January 2020.
  - 3.21** The BREEAM Very Good energy credits will be targeted.
- 

## 4. BUILDING REGULATIONS BASELINE

### Methodology

- 4.1** This statement first establishes a baseline assessment of the energy demands and associated CO<sub>2</sub> emissions for the development based on Part L Building Regulations (2013). The London Plan Energy Hierarchy (Be Lean, Be Clean and Be Green) has been followed to demonstrate compliance with the planning requirement.
- 4.2** There are no self-contained dwellings in this development, therefore it will be assessed as non-domestic building using the Simplified Building Energy Model (SBEM) software. This approach has been approved by planning officer from London Borough of Haringey.
- 4.3** The estimated annual energy demand of the development has been calculated using Simplified Building Energy Model (SBEM) software, developed using the National Calculation Method (NCM 2013 Edition). SBEM calculates the Regulated energy demands associated with hot water, space heating and fixed electrical items, as well as the unregulated energy demands.
- 4.4** The results from the SBEM calculations are entered in the GLA's Carbon Emissions Reporting Spreadsheet, to convert the energy demands from current carbon factors into SAP 10.0 carbon factors. This approach is in line with the GLA Energy Assessment Guidance.

## Building Regulations Baseline

- 4.5 Table 1 shows the regulated CO<sub>2</sub> emissions for the baseline model of the development using the SAP 10 carbon factors.

Table 1: Part L (2013) Baseline Regulated and unregulated CO<sub>2</sub> Emissions for the development.

|                               | Regulated<br>(kg CO <sub>2</sub> /year) | Unregulated (kg<br>CO <sub>2</sub> /year) |
|-------------------------------|-----------------------------------------|-------------------------------------------|
| Mary Feilding Guild Care Home | 375,468                                 | 69,074                                    |

- 4.6 The BRUKL and the GLA Carbon Emissions Spreadsheet for the baseline case are presented in Appendix A and Appendix B respectively.

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## 5. BE LEAN : ENERGY EFFICIENCY MEASURES

- 5.1 The first stage of the London Plan Energy Hierarchy is demand reduction through energy efficiency measures. The energy efficiency strategy will aim to go above and beyond baseline Part L 2013 CO<sub>2</sub> emission reduction requirements and aim for the London Plan target of 15% CO<sub>2</sub> reduction through energy efficiency measures.
- 5.2 This section outlines the currently proposed strategies for achieving these targets. These measures, or alternatives, can be provided to achieve the policy requirements.
- 5.3 The energy efficiency strategy should be reviewed at each detailed stage of the development, to ensure the most recent policy targets are being achieved.

### Building Envelope

- 5.4 This development will incorporate enhanced insulation in the building envelope (walls, roofs, floors and windows) with aims to achieve average U-values better than those required by Part L2A (2013) of the Building Regulations. These are likely to include the following targets which will be further refined at detailed design stage:
- > High Performance Double Glazing with a U-value of 1.3 W/m<sup>2</sup>.K (soft low E-coating, G-value of 0.30 and light transmittance of 0.60) .
  - > Solid door U-value of 1.80W/m<sup>2</sup>K;
  - > External walls with a U-value of 0.18W/m<sup>2</sup>.K;
  - > Wall to car park U value of 0.25W/m<sup>2</sup>K;

- > Basement floor U-value of 0.10 W/m<sup>2</sup>.K;
- > Ground floor above car park u-value of 0.15W/m<sup>2</sup>.K;
- > Pitched and flat roof U-value of 0.15 W/m<sup>2</sup>.K

## Air Tightness and Ventilation

- 5.5 All the bedrooms, circulation spaces, store rooms and nurse station will be naturally ventilated.
- 5.6 Intermittent extract fans are expected to be specified for the wet rooms such as ensuites, WCs, laundry, and changing rooms. Extract fans will achieve a specific fan power of 0.3W/l/s, or lower as specified in the Non-Domestic Building Services Compliance Guide.
- 5.7 The kitchen located in the basement will have a dedicated supply and extract fans which will achieve specific fan powers of 1.0W/l/s and 0.80 respectively.
- 5.8 A mechanical ventilation unit with heat recovery is proposed for all areas excluding transitory areas and spaces mentioned above. The assessment has considered a specific fan power of no more than 1.0 W/l/s and heat recovery efficiency greater than 85%, with the inclusion of a summer bypass. Ventilation is expected to be demand controlled using variable speed control and CO<sub>2</sub> sensors.
- 5.9 The proposed development is expected to achieve an air permeability of 5 m<sup>3</sup>/hr.m<sup>2</sup> or less, thus further reducing space heating demands.

## Space Heating

- 5.10 The space heating requirement will be reduced by the fabric and air tightness measures detailed above. A gas boiler with an efficiency of 96% is utilised for space heating at the *Be Lean* stage.
- 5.11 Further details of the proposed heating strategy are presented in *Be Clean*.
- 5.12 It is expected that underfloor heating and ducted ceiling cassettes emitters will be specified.

## Hot Water

- 5.13 The hot water provisions will be provided by the communal air source heat pumps and gas boilers. A low heat loss storage cylinder will cover will be specified to cover the required hot water demand.
- 5.14 A gas boiler with an efficiency of 96% is utilised for hot water provisions at the *Be Lean* stage.

- 5.15 Hot water is contributing to most of the energy demand of the development, this is due the large number of shower rooms. Therefore, the use of wastewater heat recovery system will benefit the development, as it will reduce energy usage and running costs.
- 5.16 A wastewater heat recovery system (WWHR) extracts heat from wastewater from showers through a heat exchanger. This process provides free heat to the system reducing the requirement from the heating system.
- 5.17 WWHR has been specified for the 70 ensembles, assisted bathroom and further 4 shower rooms in the changing rooms and spas located on the first and second floors.
- 5.18 The WWHR will be installed on individual shower cubicle and be gravity feed system. The WWHR is expected to achieve an efficiency of 54% based on 8 litres/minute flow rate. This flow rate is in line with the requirements of the WAT 01 BREEAM credits.

## Lighting

- 5.19 Energy efficient LED light fittings are to be installed for all areas. Lighting in all areas is expected to exceed 110 lamp lumens per circuit-watt with light output ratio of 1. The light output ratio is the percentage of light emitted from the light source.
- 5.20 Appropriate demand reducing light controls are to be installed in most areas. This will be achieved through the use of occupancy sensors and photoelectric controls for the highly glazed areas.

## Metering

- 5.21 Lighting, heating, hot water and cooling are to be separately sub-metered.

## BREEAM

- 5.22 The proposed energy strategy above is expected some energy credits to enable the development to achieve the BREEAM Very Good requirement.

## Limiting the Risk of Summer Overheating & Cooling

- 5.23 Minimising the risk of summer overheating is important so as to ensure that buildings are adapted to climate change and remains comfortable to the occupants in the future.
- 5.24 All principal spaces, such as bedrooms and communal spaces have been assessed against CIBSE TM59 overheating criteria as per the Haringey request. The risk of overheating has been minimized as much as possible using passive design measures (from the London Plan Cooling Hierarchy) and by prioritizing natural ventilation in order to avoid the need for active cooling in those spaces. The details of the assessment are presented in a dedicated overheating report (Dynamic Overheating Assessment, Hodkinson Consultancy, December 2022).

- 5.25** It is anticipated that a G-Value of 0.30 will be required to comply with the Part L Criterion 3 limiting the effects of heat gains in summer. The initial SBEM calculation showing compliance with the Part L Criterion 3.
- 5.26** Cooling has not been specified for majority of the development, this includes bedrooms, transitory spaces and generally unoccupied spaces. Where cooling is specified is for specialist rooms which require controlled indoor temperatures.
- 5.27** Cooling will be provided by a dedicated air source heat pump. The air source heat pump will have a cooling Energy Efficiency Ratio (EER) of 4.0 and Seasonal Energy Efficiency Ratio SEER of 6.5.
- 5.28** Table 2 below shows the cooling demand for the development is small and significantly less than the notional cooling demand.

**Table 2: Cooling Demands**

|                 | <b>Area weighted cooling demand (MJ/m<sup>2</sup>)</b> | <b>Total area weighted cooling demand (MJ/year)</b> |
|-----------------|--------------------------------------------------------|-----------------------------------------------------|
| <b>Actual</b>   | 12                                                     | 69,936                                              |
| <b>Notional</b> | 21                                                     | 119,014                                             |

## **CO<sub>2</sub> Emissions Following *Be Lean* Measures**

- 5.29** Table 3 shows the development achieves a 29.3% reduction in CO<sub>2</sub> emissions through the application of energy efficiency measures, the development exceeds the required 15% reduction in regulated CO<sub>2</sub> at the *Be Lean* stage.

**Table 3: Reduction in regulated CO<sub>2</sub> emissions using SAP 10 carbon factors following *Be Lean* measures.**

| <b>Part L 2013</b>                   | <b>Baseline (kg CO<sub>2</sub>/year)</b> | <b><i>Be Lean</i> (kg CO<sub>2</sub>/year)</b> | <b>Reduction in CO<sub>2</sub> Emissions Achieved Over the Baseline (%)</b> |
|--------------------------------------|------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Mary Feilding Guild Care Home</b> | 375,468                                  | 265,274                                        | <b>29.3%</b>                                                                |

- 5.30** The GLA Carbon Emissions Spreadsheet for the *Be Lean* are shown in Appendix C. The other supporting documents are shown in Appendix D.

## 6. BE CLEAN : DECENTRALISED ENERGY

6.1 In line with the London Plan Policy SI3 Energy Infrastructure, the heat source for the onsite communal heat network has been considered in line with the following hierarchy:

- a. *connect to local existing or planned heat networks;*
- b. *use zero-emission or local secondary heat sources (in conjunction with heat pump, if required);*
- c. *use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network);*
- d. *use ultra-low NOx gas boilers.*

### Connect to Local Existing or Planned Heat Networks

6.2 Figure, 3 below, shows the development (green) on the London Heat Map. Figure 3 shows there are no current or proposed networks in place for the development to connect to.

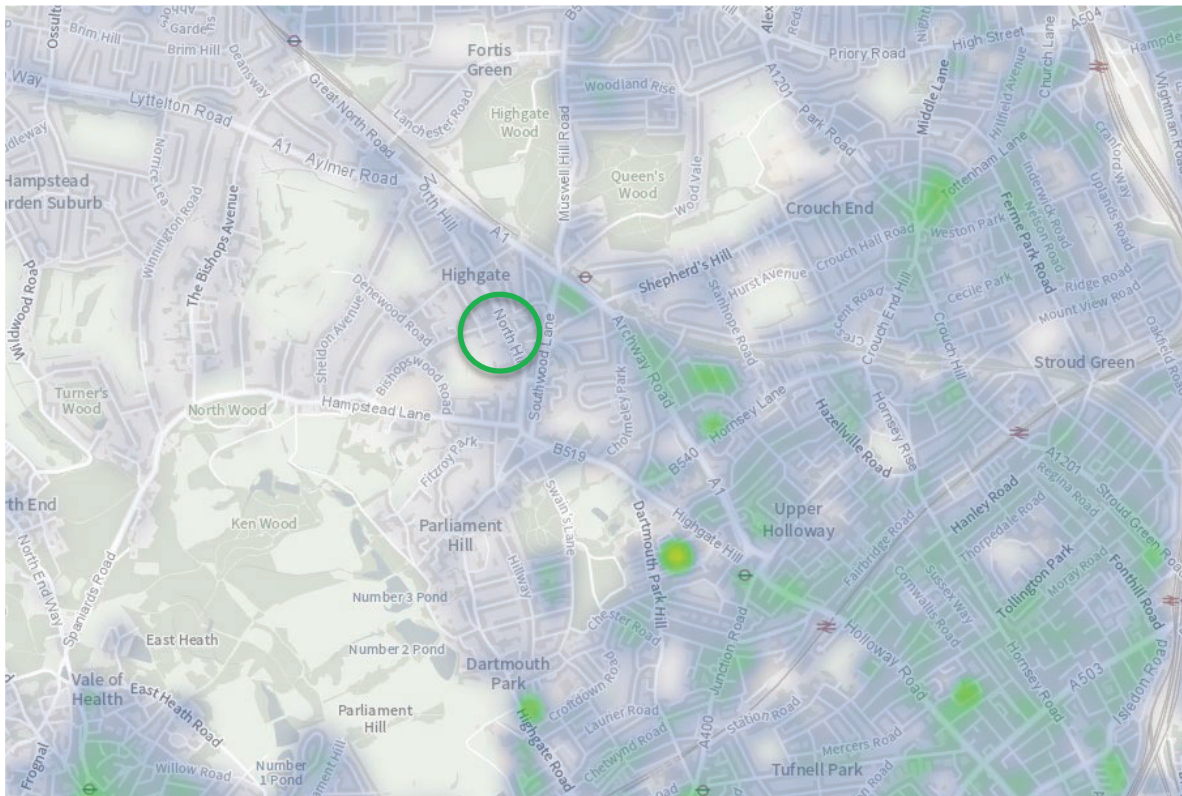


Figure 3: London Heat Map

## **Zero-Emission or Local Secondary Heat Sources (with Heat Pumps)**

- 6.3** A low carbon heat network is proposed for the development. This will consist of air source heat pumps which will act as the lead heat source for the network. Gas boilers will assist in providing hot water provisions during periods of high demand, such as weekday mornings and evenings.
- 6.4** It is expected that across a given year the proportion of hot water delivered from each technology would be as follows:
- > Air source heat pumps: 70% (primary source, baseload supply);
  - > Gas boilers: 30% (delivery of peak and backup supply).
- 6.5** The use of ground source heat pumps was considered for this development, further information is provided in the *Be Green* chapter.
- 6.6** The air source heat pumps will have Seasonal Coefficient of Performance (SCOP) of 3.15 and the gas boilers are to have an efficiency of 96%.
- 6.7** The heat network is expected to run on a primary operating temperatures of 55/47°C.
- 6.8** The development will adhere to the requirements CIBSE Heat Networks Code of Practice for design and construction.
- 6.9** A roof plan indicating where the external heat pumps could be located is shown in Appendix E. It is anticipated that the heat pump units are to be installed on the second floor roof. The rooftop heat pump units will be connected to the plant room and where the heat distribution will be led from.
- 6.10** In addition to the heat pump internal units and gas boilers, the plant room will also contain thermal stores and other ancillary plant. The plant room has been sized at 102 m<sup>2</sup>, with a floor to ceiling height of 3.96m. An indicative plant room layout is shown in the Appendix F.
- 6.11** To achieve the required annual contribution for space heating and hot water, the following installed plant capacities are currently estimated to be:
- > 204kW of Air Source Heat Pumps;
  - > 102kW of Gas Boilers;
  - > Appropriate Thermal storage.

## CO<sub>2</sub> Emissions Following *Be Clean* Measures

6.12 Table 4 below, shows there is a further 32.2% reduction in CO<sub>2</sub> emissions following the *Be Clean* stage of the energy hierarchy.

Table 4: Reduction in regulated CO<sub>2</sub> emissions using SAP 10 carbon factors following *Be Clean* measures.

| Part L 2013                   | Baseline<br>(kg CO <sub>2</sub> /year) | <i>Be Lean</i><br>(kg CO <sub>2</sub> /year) | <i>Be Clean</i><br>(kg CO <sub>2</sub> /year) | Reduction in CO <sub>2</sub><br>Emissions Achieved<br>Over the <i>Be Lean</i><br>(%) |
|-------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------|
| Mary Feilding Guild Care Home | 375,468                                | 265,270                                      | 144,280                                       | 32.2%                                                                                |

6.13 BRUKL and the GLA Carbon Emissions Reporting Spreadsheet following the *Be Clean* measures are shown in Appendix G. The other supporting documents are shown in Appendix H.

## BE GREEN: RENEWABLE ENERGY TECHNOLOGIES

6.14 The third part of the London Plan Energy Hierarchy is *Be Green* which examines the feasibility of renewable energy technologies.

6.15 In line with the Energy Hierarchy and the planning requirement to achieve a 20% reduction in CO<sub>2</sub> emissions from onsite renewable energy technologies, an assessment of the feasibility of renewable energy technologies is undertaken and presented in this section.

6.16 The results of the feasibility study of low carbon and renewable energy technologies are summarised in Appendix I.

### Wind Turbines

6.17 Small rooftop wind turbines are designed to generate electricity from the wind.

6.18 Urban rooftop wind turbines do not generally perform sufficiently well to warrant their installation, due to the low and turbulent wind conditions present. They are therefore likely to remain technically unfeasible.

6.19 It has therefore been concluded that wind turbines are not a suitable technology for this site.

### Ground Source Heat Pumps (GSHPs)

6.20 Heat Pumps upgrade energy from the ground and utilise it for space heating and hot water.

- 6.21** Ground Source Heat Pumps (GSHPs) are able to provide substantial reductions in energy. However, it will require extensive work on the current site to carry out ground excavation works to bury coils, or boreholes. This will be very difficult and expensive to undertake.
- 6.22** It has therefore been concluded that ground source heat pumps are not a suitable technology for this development.

### **Air Source Heat Pumps (ASHPs)**

- 6.23** Air Source Heat Pumps are a more economical alternative to GSHPs as they do not require ground works.
- 6.24** Air source heat pump utilise the ambient air temperature to generate heat. Communal air source heat pumps are proposed for the development and have been considered in the *Be Clean* section of the report.
- 6.25** In cases where cooling is required it is more efficient for the heat pump to simultaneously to provide heating. A dedicated air source heat pump will be provided for the areas that require cooling. The unit which is specified is expected to have SCOP of 4.2.

### **Solar Thermal Panels**

- 6.26** Solar thermal panels use the sun's energy to generate hot water. Solar thermal panels are generally installed on the roofs, with panels facing as close to south as possible to maximise their efficiency.
- 6.27** Whilst there is adequate hot water demand, wastewater heat recovery system and photovoltaics have been determined to be more suitable technologies to enable the development to comply with the planning requirements. This is due to the lack roof space available for sufficient solar thermal system to be specified because large proportion roof available space has been allocated to house the external heat pump units.

### **Photovoltaics (PV)**

- 6.28** PV panels generate electricity from solar radiation. The generating potential of PV panels is not dependent on development demand, but only on available roof space for installation and ensuring that they are not over shaded. PV panels have the potential to offset a considerable amount of CO<sub>2</sub> emissions they represent a suitable measure for generating renewable energy.
- 6.29** It is estimated that a total PV output of 14kWp, with a south-east/south-west orientation and a pitch of 15 degrees would be required for the development.
- 6.30** It is expected that the PV will be installed on the 3rd floor flat roof, this roof has been determined to be the most suitable location for the PV panels. The PV has been maximised on the roof space

available. PV could not be allocated to the second-floor flat roof because the external heat pump units will be located there and because of shading from the 3rd floor above. In addition, PV could not be specified on the pitched roof because the development is located in a conservation area.

**6.31** An indicative roof plan showing the PV layout is shown in the Appendix J.

## CO<sub>2</sub> Emissions Following *Be Green* Measures

**6.32** Table 5, below, outlines there is further 0.6% reduction in CO<sub>2</sub> emissions following the inclusion of PV for the proposed development.

**Table 5: Reduction in regulated CO<sub>2</sub> emissions using SAP 10 carbon factors, following *Be Green* measures**

|                                  | Baseline<br>(kg CO <sub>2</sub> /year) | <i>Be Lean</i><br>(kgCO <sub>2</sub> /year) | <i>Be Clean</i><br>(kg CO <sub>2</sub> /year) | <i>Be Green</i><br>(kgCO <sub>2</sub> /year) | Reduction in CO <sub>2</sub><br>Emissions<br>Achieved Over<br>the <i>Be Clean</i> (%) |
|----------------------------------|----------------------------------------|---------------------------------------------|-----------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------|
| Mary Feilding<br>Guild Care Home | 375,468                                | 265,270                                     | 144,280                                       | 142,008                                      | 0.6%                                                                                  |

**6.33** The development achieves a 32.8% reduction in regulated CO<sub>2</sub> emission through the use of onsite renewable energy technologies of air source heat pumps and PV at the *Be Clean* and *Be Green* stages.

**6.34** BRUKL and the GLA Carbon Emissions Reporting Spreadsheet following the *Be Green* measures are shown in Appendix K. The other supporting documents are shown in Appendix L.

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## **7. BE SEEN : ENERGY MONITORING**

- 7.1** The London Plan introduces a fourth stage to the energy hierarchy; the ‘be seen’ stage, which requires monitoring and reporting of the actual operational energy performance of major developments for at least five years.
- 7.2** An effectively implemented post-construction monitoring regime can have a number of benefits including environmental (e.g. reduced grid infrastructure strain, carbon emissions reduction) and socio-economic (e.g. reduced occupants’ bills, raised awareness around energy usage).
- 7.3** It is widely accepted that a gap exists between the estimated performance of a building at design stage and the actual building performance post-construction. The aim is to bridge the gap to ensure buildings are operating as efficiently as they are designed to.

### **Planning Stage**

- 7.4** In line with the policy requirements for this stage. The following tasks shall be undertaken:
- > The necessary data will be uploaded to the 'be seen' portal when it becomes available.
  - > Following planning approval, the different reporting stages and target dates for submission will be reviewed and agreed with the design team.
  - > All affected parties (e.g. developer, building owner, landlord, or occupier) will be made aware of their responsibilities at subsequent reporting stages.
  - > The metering and controls strategy is to be developed in the detail design but is expected to include the information listed in the next section.

### **Metering and Controls**

- 7.5** Meters are to be installed in accordance with the requirements of the Heat Networks (Metering and Billing) Regulations 2014. This includes meters measuring fuel input and heat output of plant, block/building level meters and final customers meters
- 7.6** Standard monitoring of the plant room and heat network will be undertaken during operation. As a minimum, the following will be metered:
- > Gas, electricity, and water used in the plant room;
  - > Heat and electricity leaving the plant room;
  - > Heat entering each building;

> Final customer heat consumption.

## 8. ZERO CARBON

- 8.1** In line with the GLA guidelines, non-residential areas will need achieve the zero carbon target. Therefore, the development is subject to an additional offset payment to meet a 100% reduction in Regulated CO<sub>2</sub> emissions to achieve zero carbon target. This offset payment to the London borough of Haringey is expected to be allocated to carbon reductions savings elsewhere in the borough
- 8.2** After the inclusion of *Be Lean, Be Clean* and *Be Green* measures as specified above, it is estimated that the remaining regulated CO<sub>2</sub> emissions are expected to be 142.0 Tonnes CO<sub>2</sub> per annum.
- 8.3** In line with the London Borough of Haringey's carbon offsetting policy, a carbon offset fee of £95 per tonne of Regulated CO<sub>2</sub> per year, for a period of 30 years, has been used to calculate the "Zero Carbon" contribution
- 8.4** Table 6 below shows the calculation for the carbon offset payment, which is estimated to be £404,721 for the development.

**Table 6: Carbon Offset Payment Required to Achieve Zero Carbon**

| Carbon Offset                                     |          |
|---------------------------------------------------|----------|
| Residual CO <sub>2</sub> (tCO <sub>2</sub> /year) | 142.0    |
| Carbon Price (£/t)                                | £95      |
| Carbon Offset Payment (£)                         | £404,721 |

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## 9. SUMMARY

- 9.1 The proposed development is to redevelop the Former Mary Feilding Guild Care Home to provide a new nursing and well-being and physiotherapy centre. The development is located in the London Borough of Haringey.
- 9.2 The Energy Strategy for the development has been formulated following The London Plan Energy Hierarchy: *Be Lean*, *Be Clean*, *Be Green* and *Be Seen*. The overriding objective in the formulation of the strategy is to maximise the reductions in CO<sub>2</sub> emissions through the application of this Hierarchy with a cost-effective, viable and technically appropriate approach and to minimise the emission of other pollutants. The energy strategy has been developed in consultation with London Borough of Haringey throughout the pre-application process.
- 9.3 The proposed development has been assessed under Part L 2013, utilising the SAP 10 carbon factors.
- 9.4 The development has achieved a 29.3% reduction in regulated CO<sub>2</sub> emissions through the use of energy efficiency measures at the *Be Lean* stage.
- 9.5 In line with The London Plan, the feasibility of decentralised energy production as a *Be Clean* measure has been assessed. There are no existing or proposed heat networks for the development to connect to. A heat network has been proposed for the development, supplying heat from air source heat pumps and gas boilers. The specification of communal air source heat pump led heating system was agreed in principle with the Council's Climate Change Officer in pre-application discussions.
- 9.6 The full spectrum of *Be Green* renewable energy generating technologies has been considered. Solar photovoltaics and air source heat pumps are considered the most appropriate technologies. The development achieves a 32.8% reduction in regulated CO<sub>2</sub> emission through the application of air source heat pumps and photovoltaics at the *Be Clean* and *Be Green* stages.
- 9.7 The proposed development is predicted to achieve an overall reduction of onsite regulated CO<sub>2</sub> emissions of 62.2%. This exceeds the 35% reduction in regulated CO<sub>2</sub> emissions required by the London Plan policy. This represents a high level of sustainable design and construction.

**Summary Table 7 Mary Feilding Guild Care Home Carbon Dioxide Emissions and Savings after each stage of the Energy Hierarchy**

|                                | Regulated CO <sub>2</sub> Emissions (kg/yr) | Unregulated CO <sub>2</sub> Emissions (kg/yr) | Savings Regulated CO <sub>2</sub> Emissions (kg/yr) | Reduction in Regulated CO <sub>2</sub> Emissions Achieved (%) |
|--------------------------------|---------------------------------------------|-----------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|
| <b>Baseline</b>                | 375,468                                     | 69,074                                        | -                                                   | -                                                             |
| <b>After Be Lean Measures</b>  | 265,270                                     | 69,074                                        | 110,198                                             | 29.3%                                                         |
| <b>After Be Clean Measures</b> | 144,280                                     | 69,074                                        | 120,990                                             | 32.2                                                          |
| <b>After Be Green Measures</b> | 142,008                                     | 69,074                                        | 2,272                                               | 0.6%                                                          |
| <b>Cumulative On-Site</b>      | -                                           | -                                             | 233,460                                             | <b>62.2%</b>                                                  |

- 9.8** In line with the GLA guidelines, a carbon offset payment is required achieve the Zero Carbon target. A regulated CO<sub>2</sub> emission of 127.8 tCO<sub>2</sub> emission will need to be offset over a 30-year period. The table below shows the estimated carbon offset payment for the development is expected to be £404,721.

| <b>Table 8: Carbon Offset</b>                         |          |
|-------------------------------------------------------|----------|
| <b>Residual CO<sub>2</sub> (tCO<sub>2</sub>/year)</b> | 142.0    |
| <b>Carbon Price (£/t)</b>                             | £95      |
| <b>Carbon Offset Payment (£)</b>                      | £404,721 |

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## **APPENDICES**

### **Appendix A**

BRUKL – *Be Lean*

### **Appendix B**

GLA Carbon Emission Reporting - *Baseline*

### **Appendix C**

GLA Carbon Emission Reporting – *Be Lean*

### **Appendix D**

CO<sub>2</sub> Emissions Summary – *Be Lean*

### **Appendix E**

Roof Layout Showing Heat Pumps

### **Appendix F**

Plant Room Layout

### **Appendix G**

BRUKL – *Be Clean* & GLA Carbon Emission Reporting

## **Appendix H**

CO<sub>2</sub> Emissions Summary – *Be Clean*

## **Appendix I**

Renewable and Low Carbon Technology Feasibility

## **Appendix J**

PV Layout

## **Appendix K**

BRUKL – *Be Green* & GLA Carbon Emission Reporting

## **Appendix L**

CO<sub>2</sub> Emissions Summary – *Be Green*

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## **APPENDIX A: BRUKL – *BE LEAN***

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## Project name

**Highgate Care Home****As designed****Date:** Thu Nov 18 13:59:34 2021**Administrative information****Building Details****Address:** N6, London**Certification tool****Calculation engine:** SBEM**Calculation engine version:** v5.6.b.0**Interface to calculation engine:** DesignBuilder SBEM**Interface to calculation engine version:** v6.1.8**BRUKL compliance check version:** v5.6.b.0**Certifier details****Name:****Telephone number:****Address:** , ,**Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target**

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 77.3                |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 77.3                |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 55.3                |
| Are emissions from the building less than or equal to the target?                                  | BER =< TER          |
| Are as built details the same as used in the BER calculations?                                     | Separate submission |

**Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency**

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

**Building fabric**

| Element                                                                                                                                                                                                                                                                                                                                                                                                                                      | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | Surface where the maximum value occurs* |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|-----------------------------------------|
| Wall**                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.35                  | 0.19                 | 0.25                 | "00 Basement - Hair & Beauty Salon_P_7" |
| Floor                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.25                  | 0.12                 | 0.12                 | "00 Basement - Gym_S_3"                 |
| Roof                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.25                  | 0.15                 | 0.15                 | "04 Second Floor - Lounge_R_5"          |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                                                                                                                                                                                     | 2.2                   | 1.3                  | 1.3                  | "00 Basement - Gym_G_11"                |
| Personnel doors                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.2                   | 1.8                  | 1.8                  | "01 Ground Floor - Corridor_D_18"       |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                         | 1.5                   | -                    | -                    | "No external vehicle access doors"      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.5                   | -                    | -                    | "No external high usage entrance doors" |
| 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)]                                                                                                                                                            |                       |                      |                      |                                         |
| * There might be more than one surface where the maximum U-value occurs.<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.<br>N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                         |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 5             |

## Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

### 1- Gas Boiler & Heat Pump

|                                                                                                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                                                       | 0.96               | 4                  | -                  | -             | -             |
| Standard value                                                                                                                                                                                                                                    | 0.91*              | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system                                                                                                                                                         |                    |                    |                    |               | YES           |
| * Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82. |                    |                    |                    |               |               |

### 2- Gas Boiler

|                                                                                                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                                                       | 0.96               | -                  | -                  | -             | -             |
| Standard value                                                                                                                                                                                                                                    | 0.91*              | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system                                                                                                                                                         |                    |                    |                    |               | YES           |
| * Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82. |                    |                    |                    |               |               |

### 1- Project DHW

|                | Water heating efficiency          | Storage loss factor [kWh/litre per day] |
|----------------|-----------------------------------|-----------------------------------------|
| This building  | Hot water provided by HVAC system | 0                                       |
| Standard value | N/A                               | N/A                                     |

### Local mechanical ventilation, exhaust, and terminal units

| ID | System type in Non-domestic Building Services Compliance Guide                                          |
|----|---------------------------------------------------------------------------------------------------------|
| A  | Local supply or extract ventilation units serving a single area                                         |
| 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 supply and extract ventilation units serving a single room or zone with heating and heat recovery |
| E  | Local supply and extract ventilation system serving a single area with heating and heat recovery        |
| F  | Other local ventilation units                                                                           |
| G  | Fan-assisted terminal VAV unit                                                                          |
| H  | Fan coil units                                                                                          |
| I  | Zonal extract system where the fan is remote from the zone with grease filter                           |

| 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 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone | Standard      |  |
| 00 Basement - Gym                 | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Chefs Office        | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Consult             | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Cinema room         | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Office              | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Hair & Beauty Salon | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Barbers             | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Wellness Shop       | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |

| 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 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone | Standard      |  |
| 02 First Floor - Treatment & Medical Room  | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Treatment & Medical Rooms | 2             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Treatment & Medical Rooms | 1             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Staff Room                | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Lounge                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Dinning                   | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 04 Second Floor - Lounge                   | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 04 Second Floor - Dining                   | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Meet & Greet             | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Cafe                     | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Admin                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Restaurant               | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Manager                  | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Male Changing room           | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Female Change                | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Reception                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Laundry                      | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Kitchen                      | -             | -   | -   | -   | -   | -   | -   | -   | 1 | -    | N/A           |  |
| 00 Basement - Kitchen Staff Change         | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - WC                           | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Change                       | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - WC                           | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Change                       | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Kosher Kitchen               | -             | -   | -   | -   | -   | -   | -   | -   | 1 | -    | N/A           |  |
| 00 Basement - Reception                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Ensuite 1                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 2                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 3                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - WC 1                      | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 4                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Spa                       | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Staff Change              | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 6                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 7                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 8                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 9                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 10                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 11                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 12                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 13                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 14                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 15                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |

[illegible]

| General lighting and display lighting        |                | Luminous efficacy [lm/W] |      |              |                      |
|----------------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                                    |                | Luminaire                | Lamp | Display lamp | General lighting [W] |
|                                              | Standard value | 60                       | 60   | 22           |                      |
| 00 Basement - Gym                            |                | -                        | 110  | -            | 381                  |
| 00 Basement - Chefs Office                   |                | 110                      | -    | -            | 63                   |
| 00 Basement - Consult                        |                | 110                      | -    | -            | 445                  |
| 00 Basement - Cinema room                    |                | -                        | 110  | -            | 185                  |
| 00 Basement - Office                         |                | 110                      | -    | -            | 107                  |
| 00 Basement - Comms                          |                | 110                      | -    | -            | 39                   |
| 00 Basement - Hair & Beauty Salon            |                | -                        | 110  | 110          | 286                  |
| 00 Basement - Barbers                        |                | -                        | 110  | 110          | 284                  |
| 00 Basement - Wellness Shop                  |                | -                        | 110  | 110          | 215                  |
| 02 First Floor - Treatment & Medical Room    |                | 110                      | -    | -            | 127                  |
| 02 First Floor - Treatment & Medical Rooms 2 |                | 110                      | -    | -            | 221                  |
| 02 First Floor - Treatment & Medical Rooms 1 |                | 110                      | -    | -            | 152                  |
| 02 First Floor - Staff Room                  |                | -                        | 110  | -            | 57                   |
| 02 First Floor - Lounge                      |                | -                        | 110  | -            | 238                  |
| 02 First Floor - Dinning                     |                | -                        | 110  | -            | 105                  |
| 04 Second Floor - Lounge                     |                | -                        | 110  | -            | 181                  |
| 04 Second Floor - Dining                     |                | -                        | 110  | -            | 118                  |
| 01 Ground Floor - Meet & Greet               |                | 110                      | -    | -            | 81                   |
| 01 Ground Floor - Cafe                       |                | -                        | 110  | -            | 122                  |
| 01 Ground Floor - Admin                      |                | 110                      | -    | -            | 151                  |
| 01 Ground Floor - Restaurant                 |                | -                        | 110  | -            | 198                  |
| 01 Ground Floor - Servery                    |                | -                        | 110  | 110          | 44                   |
| 01 Ground Floor - Manager                    |                | 110                      | -    | -            | 102                  |
| 00 Basement - Corridor                       |                | -                        | 110  | -            | 252                  |
| 00 Basement - Lift & Stairs                  |                | -                        | 110  | -            | 58                   |
| 00 Basement - Male Changing room             |                | -                        | 110  | -            | 30                   |
| 00 Basement - Female Change                  |                | -                        | 110  | -            | 40                   |
| 00 Basement - Stairs & Lobby                 |                | -                        | 110  | -            | 73                   |
| 00 Basement - Corridor                       |                | -                        | 110  | -            | 89                   |
| 00 Basement - Lobby                          |                | -                        | 110  | -            | 120                  |
| 00 Basement - Maintenance Store              |                | 110                      | -    | -            | 36                   |
| 00 Basement - Hydro plant room               |                | 110                      | -    | -            | 54                   |
| 00 Basement - Sauna                          |                | 110                      | -    | -            | 118                  |
| 00 Basement - Hydro Pool                     |                | -                        | 110  | -            | 214                  |
| 00 Basement - Reception                      |                | -                        | 110  | 110          | 132                  |
| 00 Basement - Plant Room                     |                | 110                      | -    | -            | 168                  |
| 00 Basement - Handyman                       |                | 110                      | -    | -            | 135                  |
| 00 Basement - Stair & Lift                   |                | -                        | 110  | -            | 62                   |
| 00 Basement - Laundry                        |                | -                        | 110  | -            | 330                  |
| 00 Basement - Kitchen                        |                | -                        | 110  | -            | 293                  |
| 00 Basement - Kitchen Staff Change           |                | -                        | 110  | -            | 28                   |
| 00 Basement - WC                             |                | -                        | 110  | -            | 33                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 00 Basement - Lobby                   |                | -                        | 100  | -            | 38                   |
| 00 Basement - Change                  |                | -                        | 110  | -            | 31                   |
| 00 Basement - WC                      |                | -                        | 110  | -            | 30                   |
| 00 Basement - Change                  |                | -                        | 110  | -            | 32                   |
| 00 Basement - Equipment Store         |                | 110                      | -    | -            | 46                   |
| 00 Basement - Kosher Kitchen          |                | -                        | 110  | -            | 111                  |
| 00 Basement - Kitchen Store           |                | 110                      | -    | -            | 37                   |
| 00 Basement - Reception               |                | -                        | 110  | 110          | 85                   |
| 02 First Floor - Corridor             |                | -                        | 110  | -            | 479                  |
| 02 First Floor - Bedroom              |                | -                        | 110  | -            | 316                  |
| 02 First Floor - Ensuite 1            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 2            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 3            |                | -                        | 110  | -            | 40                   |
| 02 First Floor - Linen                |                | 110                      | -    | -            | 11                   |
| 02 First Floor - Linen                |                | 110                      | -    | -            | 11                   |
| 02 First Floor - Store                |                | 110                      | -    | -            | 49                   |
| 02 First Floor - WC 1                 |                | -                        | 110  | -            | 34                   |
| 02 First Floor - Nurse Station        |                | 110                      | -    | -            | 81                   |
| 02 First Floor - Stairs & Lift        |                | -                        | 110  | -            | 56                   |
| 02 First Floor - Ensuite 4            |                | -                        | 110  | -            | 24                   |
| 02 First Floor - Medication Store     |                | 110                      | -    | -            | 27                   |
| 02 First Floor - Spa                  |                | -                        | 110  | -            | 52                   |
| 02 First Floor - Hoist                |                | 110                      | -    | -            | 31                   |
| 02 First Floor - Staff Change         |                | -                        | 110  | -            | 32                   |
| 02 First Floor - Bedrooms 2           |                | -                        | 110  | -            | 189                  |
| 02 First Floor - Bedrooms 3           |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 6            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Bedrooms 4           |                | -                        | 110  | -            | 216                  |
| 02 First Floor - Ensuite 7            |                | -                        | 110  | -            | 20                   |
| 02 First Floor - Ensuite 8            |                | -                        | 110  | -            | 24                   |
| 02 First Floor - Store & Linen        |                | 110                      | -    | -            | 35                   |
| 02 First Floor - Ensuite 9            |                | -                        | 110  | -            | 26                   |
| 02 First Floor - Bedrooms 5           |                | -                        | 110  | -            | 140                  |
| 02 First Floor - Ensuite 10           |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Bedrooms 6           |                | -                        | 110  | -            | 129                  |
| 02 First Floor - Bedrooms 7           |                | -                        | 110  | -            | 43                   |
| 02 First Floor - Ensuite 11           |                | -                        | 110  | -            | 30                   |
| 02 First Floor - Ensuite 12           |                | -                        | 110  | -            | 22                   |
| 02 First Floor - Ensuite 13           |                | -                        | 110  | -            | 23                   |
| 02 First Floor - Bedrooms 8           |                | -                        | 110  | -            | 51                   |
| 02 First Floor - Ensuite 14           |                | -                        | 110  | -            | 34                   |
| 02 First Floor - Bedrooms 9           |                | -                        | 110  | -            | 50                   |
| 02 First Floor - Bedrooms             |                | -                        | 110  | -            | 62                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 02 First Floor - Ensuite 15           |                | -                        | 110  | -            | 21                   |
| 02 First Floor - Stairs & Lift        |                | -                        | 110  | -            | 58                   |
| 02 First Floor - Ensuite              |                | -                        | 110  | -            | 37                   |
| 02 First Floor - WC 2                 |                | -                        | 110  | -            | 29                   |
| 02 First Floor - WC                   |                | -                        | 110  | -            | 29                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 99                   |
| 03 Second Floor - Stairs & Lift       |                | -                        | 110  | -            | 64                   |
| 03 Second Floor - Corridor            |                | -                        | 110  | -            | 29                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 54                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 91                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 23                   |
| 05 Third Floor - Stair & Lift         |                | -                        | 110  | -            | 60                   |
| 05 Third Floor - Lobby                |                | -                        | 110  | -            | 28                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 63                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 41                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 19                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 71                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 20                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 19                   |
| 04 Second Floor - Bedroom             |                | -                        | 110  | -            | 142                  |
| 04 Second Floor - Corridor            |                | -                        | 110  | -            | 365                  |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 166                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Stair & Lift        |                | -                        | 110  | -            | 58                   |
| 04 Second Floor - Nurse station       |                | 110                      | -    | -            | 89                   |
| 04 Second Floor - Medical Store       |                | 110                      | -    | -            | 30                   |
| 04 Second Floor - Spa                 |                | -                        | 110  | -            | 62                   |
| 04 Second Floor - Hoist               |                | 110                      | -    | -            | 33                   |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 423                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 23                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Store               |                | 110                      | -    | -            | 15                   |
| 04 Second Floor - WC                  |                | -                        | 110  | -            | 35                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 28                   |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 153                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Stair & Lift        |                | -                        | 110  | -            | 59                   |

| General lighting and display lighting   |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|-----------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                               |                | Luminaire                | Lamp | Display lamp |                      |
|                                         | Standard value | 60                       | 60   | 22           |                      |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 24                   |
| 04 Second Floor - Bedroom               |                | -                        | 110  | -            | 73                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 33                   |
| 04 Second Floor - Bedroom               |                | -                        | 110  | -            | 49                   |
| 04 Second Floor - WC                    |                | -                        | 110  | -            | 35                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 38                   |
| 04 Second Floor - Bedrooms              |                | -                        | 110  | -            | 56                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 53                   |
| 01 Ground Floor - Cafe Store            |                | 110                      | -    | -            | 10                   |
| 01 Ground Floor - Reception             |                | -                        | 110  | 110          | 148                  |
| 01 Ground Floor - Foyer & Central Hub 1 |                | -                        | 110  | -            | 86                   |
| 01 Ground Floor - Bedroom 1             |                | -                        | 110  | -            | 310                  |
| 01 Ground Floor - Ensuite 1             |                | -                        | 110  | -            | 24                   |
| 01 Ground Floor - Stair & lift 1        |                | -                        | 110  | -            | 64                   |
| 01 Ground Floor - Ensuite 2             |                | -                        | 110  | -            | 40                   |
| 01 Ground Floor - Linen                 |                | 110                      | -    | -            | 12                   |
| 01 Ground Floor - Corridor              |                | -                        | 110  | -            | 352                  |
| 01 Ground Floor - Linen                 |                | 110                      | -    | -            | 11                   |
| 01 Ground Floor - WC 1                  |                | -                        | 110  | -            | 35                   |
| 01 Ground Floor - Foyer & Central Hub 2 |                | -                        | 110  | -            | 232                  |
| 01 Ground Floor - Lobby                 |                | -                        | 110  | -            | 16                   |
| 01 Ground Floor - Bedrooms 1            |                | -                        | 110  | -            | 193                  |
| 01 Ground Floor - Ensuite 3             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Bin Store             |                | 110                      | -    | -            | 52                   |
| 01 Ground Floor - Medication Store      |                | 110                      | -    | -            | 26                   |
| 01 Ground Floor - Stair & lift 2        |                | -                        | 110  | -            | 61                   |
| 01 Ground Floor - Nurse                 |                | 110                      | -    | -            | 81                   |
| 01 Ground Floor - Ensuite 4             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Ensuite 5             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Store                 |                | 110                      | -    | -            | 33                   |
| 01 Ground Floor - WCs 2                 |                | -                        | 110  | -            | 68                   |
| 01 Ground Floor - Ensuite 6             |                | -                        | 110  | -            | 32                   |
| 01 Ground Floor - Bedrooms 2            |                | -                        | 110  | -            | 43                   |
| 01 Ground Floor - Bedrooms 3            |                | -                        | 110  | -            | 219                  |
| 01 Ground Floor - Ensuite 7             |                | -                        | 110  | -            | 23                   |
| 01 Ground Floor - Ensuite 8             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Ensuite 9             |                | -                        | 110  | -            | 23                   |
| 01 Ground Floor - Ensuite 10            |                | -                        | 110  | -            | 26                   |
| 01 Ground Floor - Ensuite               |                | -                        | 110  | -            | 38                   |
| 01 Ground Floor - Stair & Lift          |                | -                        | 110  | -            | 57                   |
| 01 Ground Floor - WC                    |                | -                        | 110  | -            | 28                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              |
|---------------------------------------|----------------|--------------------------|------|--------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |
|                                       | Standard value | 60                       | 60   | 22           |
| 01 Ground Floor - Bedroom             |                | -                        | 110  | -            |
|                                       |                |                          |      | 52           |

### Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

| Zone                                         | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------------------|--------------------------------|-----------------------|
| 00 Basement - Gym                            | NO (-58.2%)                    | NO                    |
| 00 Basement - Chefs Office                   | N/A                            | N/A                   |
| 00 Basement - Consult                        | N/A                            | N/A                   |
| 00 Basement - Cinema room                    | N/A                            | N/A                   |
| 00 Basement - Office                         | N/A                            | N/A                   |
| 00 Basement - Comms                          | N/A                            | N/A                   |
| 00 Basement - Hair & Beauty Salon            | N/A                            | N/A                   |
| 00 Basement - Barbers                        | N/A                            | N/A                   |
| 00 Basement - Wellness Shop                  | N/A                            | N/A                   |
| 02 First Floor - Treatment & Medical Room    | NO (-70.8%)                    | NO                    |
| 02 First Floor - Treatment & Medical Rooms 2 | NO (-71.8%)                    | NO                    |
| 02 First Floor - Treatment & Medical Rooms 1 | NO (-64.6%)                    | NO                    |
| 02 First Floor - Staff Room                  | NO (-76.7%)                    | NO                    |
| 02 First Floor - Lounge                      | NO (-50.6%)                    | NO                    |
| 02 First Floor - Dinning                     | NO (-65.1%)                    | NO                    |
| 04 Second Floor - Lounge                     | NO (-39.4%)                    | NO                    |
| 04 Second Floor - Dining                     | NO (-83.7%)                    | NO                    |
| 01 Ground Floor - Meet & Greet               | NO (-87%)                      | NO                    |
| 01 Ground Floor - Cafe                       | NO (-72.8%)                    | NO                    |
| 01 Ground Floor - Admin                      | NO (-61.5%)                    | NO                    |
| 01 Ground Floor - Restaurant                 | NO (-53%)                      | NO                    |
| 01 Ground Floor - Servery                    | N/A                            | N/A                   |
| 01 Ground Floor - Manager                    | NO (-12.3%)                    | NO                    |
| 00 Basement - Sauna                          | N/A                            | N/A                   |
| 00 Basement - Hydro Pool                     | N/A                            | N/A                   |
| 00 Basement - Reception                      | N/A                            | N/A                   |
| 00 Basement - Handyman                       | N/A                            | N/A                   |
| 00 Basement - Reception                      | N/A                            | N/A                   |
| 02 First Floor - Bedroom                     | NO (-66.7%)                    | NO                    |
| 02 First Floor - Ensuite 1                   | N/A                            | N/A                   |
| 02 First Floor - Ensuite 2                   | N/A                            | N/A                   |
| 02 First Floor - Ensuite 3                   | N/A                            | N/A                   |
| 02 First Floor - Nurse Station               | N/A                            | N/A                   |
| 02 First Floor - Ensuite 4                   | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 2                  | NO (-74%)                      | NO                    |
| 02 First Floor - Bedrooms 3                  | N/A                            | N/A                   |
| 02 First Floor - Ensuite 6                   | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 4                  | NO (-68.9%)                    | NO                    |
| 02 First Floor - Ensuite 7                   | N/A                            | N/A                   |

| Zone                            | Solar gain limit exceeded? (%) | Internal blinds used? |
|---------------------------------|--------------------------------|-----------------------|
| 02 First Floor - Ensuite 8      | N/A                            | N/A                   |
| 02 First Floor - Ensuite 9      | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 5     | NO (-52.1%)                    | NO                    |
| 02 First Floor - Ensuite 10     | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 6     | NO (-67.9%)                    | NO                    |
| 02 First Floor - Bedrooms 7     | NO (-86%)                      | NO                    |
| 02 First Floor - Ensuite 11     | NO (-87.3%)                    | NO                    |
| 02 First Floor - Ensuite 12     | N/A                            | N/A                   |
| 02 First Floor - Ensuite 13     | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 8     | NO (-53.8%)                    | NO                    |
| 02 First Floor - Ensuite 14     | NO (-85.7%)                    | NO                    |
| 02 First Floor - Bedrooms 9     | NO (-80.3%)                    | NO                    |
| 02 First Floor - Bedrooms       | NO (-70.7%)                    | NO                    |
| 02 First Floor - Ensuite 15     | N/A                            | N/A                   |
| 02 First Floor - Ensuite        | N/A                            | N/A                   |
| 03 Second Floor - Bedroom       | NO (-71.7%)                    | NO                    |
| 03 Second Floor - Bedroom       | NO (-70.7%)                    | NO                    |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 03 Second Floor - Bedroom       | NO (-83%)                      | NO                    |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 05 Third Floor - Bedroom        | NO (-83%)                      | NO                    |
| 05 Third Floor - Bedroom        | NO (-86.2%)                    | NO                    |
| 05 Third Floor - Ensuite        | NO (-73.9%)                    | NO                    |
| 05 Third Floor - Bedroom        | NO (-76.7%)                    | NO                    |
| 05 Third Floor - Ensuite        | NO (-72%)                      | NO                    |
| 05 Third Floor - Ensuite        | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-78.5%)                    | NO                    |
| 04 Second Floor - Bedrooms      | NO (-83%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Nurse station | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-77%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-79%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-82.4%)                    | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-90.1%)                    | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-81.2%)                    | NO                    |

| Zone                         | Solar gain limit exceeded? (%) | Internal blinds used? |
|------------------------------|--------------------------------|-----------------------|
| 04 Second Floor - Ensuite    | NO (-90.7%)                    | NO                    |
| 01 Ground Floor - Reception  | NO (-71%)                      | NO                    |
| 01 Ground Floor - Bedroom 1  | NO (-42.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 1  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 2  | N/A                            | N/A                   |
| 01 Ground Floor - Bedrooms 1 | NO (-75.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 3  | N/A                            | N/A                   |
| 01 Ground Floor - Nurse      | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 4  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 5  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 6  | NO (-82.6%)                    | NO                    |
| 01 Ground Floor - Bedrooms 2 | NO (-92.1%)                    | NO                    |
| 01 Ground Floor - Bedrooms 3 | NO (-62.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 7  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 8  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 9  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 10 | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite    | N/A                            | N/A                   |
| 01 Ground Floor - Bedroom    | NO (-52.4%)                    | NO                    |

#### Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

#### Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

#### EPBD (Recast): Consideration of alternative energy systems

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Area [m <sup>2</sup> ]                                | 5680.3  | 5680.3   |
| External area [m <sup>2</sup> ]                       | 6680.4  | 6680.4   |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 5       | 3        |
| Average conductance [W/K]                             | 1852.68 | 3500.88  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.28    | 0.52     |
| Alpha value* [%]                                      | 17.79   | 14       |

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

## Building Use

| % Area | Building Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2      | <b>A1/A2 Retail/Financial and Professional services</b><br>A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways<br>B1 Offices and Workshop businesses<br>B2 to B7 General Industrial and Special Industrial Groups<br>B8 Storage or Distribution<br>C1 Hotels                                                                                                                                                                                                                          |
| 90     | <b>C2 Residential Institutions: Hospitals and Care Homes</b>                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3      | <b>C2 Residential Institutions: Residential schools</b><br>C2 Residential Institutions: Universities and colleges<br>C2A Secure Residential Institutions<br>Residential spaces<br>D1 Non-residential Institutions: Community/Day Centre<br>D1 Non-residential Institutions: Libraries, Museums, and Galleries<br>D1 Non-residential Institutions: Education<br>D1 Non-residential Institutions: Primary Health Care Building<br>D1 Non-residential Institutions: Crown and County Courts |
| 4      | <b>D2 General Assembly and Leisure, Night Clubs, and Theatres</b><br>Others: Passenger terminals<br>Others: Emergency services<br>Others: Miscellaneous 24hr activities<br>Others: Car Parks 24 hrs<br>Others: Stand alone utility block                                                                                                                                                                                                                                                 |

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

|                 | Actual        | Notional      |
|-----------------|---------------|---------------|
| Heating         | 29.18         | 44.4          |
| Cooling         | 3.42          | 5.82          |
| Auxiliary       | 11.24         | 9.89          |
| Lighting        | 12.03         | 18.3          |
| Hot water       | 164.17        | 233.65        |
| Equipment*      | 52.48         | 52.48         |
| <b>TOTAL **</b> | <b>220.05</b> | <b>312.06</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      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 258.24 | 381.3    |
| Primary energy* [kWh/m <sup>2</sup> ]         | 315.79 | 441.02   |
| Total emissions [kg/m <sup>2</sup> ]          | 55.3   | 77.3     |

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

| 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>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |      |
| [ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity            |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                     | Actual            | 9                 | 308.9              | 2.7                | 17.7              | 11.6          | 0.94          | 4.86             | 0.96             | 6.5  |
|                                                                                                     | Notional          | 25                | 389.6              | 8.5                | 30.1              | 10.5          | 0.82          | 3.6              | ----             | ---- |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Natural Gas |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                     | Actual            | 115.4             | 128.5              | 35.6               | 0                 | 11.1          | 0.9           | 0                | 0.96             | 0    |
|                                                                                                     | Notional          | 156.3             | 217                | 53                 | 0                 | 9.8           | 0.82          | 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                                                                                   |

# Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

## Building fabric

| Element                                                                  | U <sub>i-Typ</sub> | U <sub>i-Min</sub>                                                 | Surface where the minimum value occurs* |
|--------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|-----------------------------------------|
| Wall                                                                     | 0.23               | 0.18                                                               | "00 Basement - Gym_W_10"                |
| Floor                                                                    | 0.2                | 0.12                                                               | "00 Basement - Gym_S_3"                 |
| Roof                                                                     | 0.15               | 0.15                                                               | "04 Second Floor - Lounge_R_5"          |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.3                                                                | "00 Basement - Gym_G_11"                |
| Personnel doors                                                          | 1.5                | 1.8                                                                | "01 Ground Floor - Corridor_D_18"       |
| Vehicle access & similar large doors                                     | 1.5                | -                                                                  | "No external vehicle access doors"      |
| High usage entrance doors                                                | 1.5                | -                                                                  | "No external high usage entrance doors" |
| U <sub>i-Typ</sub> = Typical individual element U-values [W/(m²K)]       |                    | U <sub>i-Min</sub> = Minimum individual element U-values [W/(m²K)] |                                         |
| * There might be more than one surface where the minimum U-value occurs. |                    |                                                                    |                                         |

| Air Permeability   | Typical value | This building |
|--------------------|---------------|---------------|
| m³/(h.m²) at 50 Pa | 5             | 5             |

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## **APPENDIX B: GLA CARBON EMISSION REPORTING - BASELINE**

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The applicant should complete all the light blue cells including information on the modelled units, the area per unit, the number of units, the baseline energy consumption figures, the TER and the TFE.

## DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS

[illegible]

## NON-DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS

| Building Use    |  | Area per unit<br>(m <sup>2</sup> ) | Number of<br>units | Total area<br>occupied<br>(m <sup>2</sup> ) | Validation Check                                                 |                                                             | REGULATED ENERGY CONSUMPTION BY END USE (kWh/m <sup>2</sup> p.a.) TIER - SOURCE BRUAL OUTPUT |                            |                       |                                    |          |           | REGULATED ENERGY CONSUMPTION BY FUEL TYPE (kWh/m <sup>2</sup> p.a.) TIER - SOURCE BRUAL INP or "SHACS" FILE |             |                  |                                                               | REGULATED ENERGY CONSUMPTION BY FUEL TYPE (kWh/m <sup>2</sup> p.a.) - TIER BRUAL |                  | REGULATED CO <sub>2</sub> EMISSIONS                            |                                                     |
|-----------------|--|------------------------------------|--------------------|---------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------|-----------------------|------------------------------------|----------|-----------|-------------------------------------------------------------------------------------------------------------|-------------|------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------|------------------|----------------------------------------------------------------|-----------------------------------------------------|
|                 |  |                                    |                    |                                             | Calculated<br>TIER 2012<br>(kgCO <sub>2</sub> / m <sup>2</sup> ) | BRUAL<br>TIER 2012<br>(kgCO <sub>2</sub> / m <sup>2</sup> ) | Space Heating                                                                                | Fuel Type<br>Space Heating | Domestic Hot<br>Water | Fuel Type<br>Domestic Hot<br>Water | Lighting | Auxiliary | Cooling                                                                                                     | Natural Gas | Grid Electricity | 2012 CO <sub>2</sub><br>emissions<br>(kgCO <sub>2</sub> p.a.) | Natural Gas                                                                      | Grid Electricity | SAP10 CO <sub>2</sub><br>emissions<br>(kgCO <sub>2</sub> p.a.) | TIER SAP10<br>(kgCO <sub>2</sub> / m <sup>2</sup> ) |
| North hall gate |  | 5706.4                             | 1                  | 5680.3                                      | 77.3                                                             | 77.3                                                        | 44.4                                                                                         | Natural Gas                | 233.65                | Natural Gas                        | 18.3     | 9.88      | 5.62                                                                                                        | 278         | 33               | 440,897                                                       | 278                                                                              | 33               | 377,275                                                        | 66.1                                                |



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## **APPENDIX C: GLA CARBON EMISSION REPORTING – *BE LEAN***

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## **APPENDIX D: CO<sub>2</sub> EMISSIONS SUMMARY – *BE LEAN***

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CO<sub>2</sub> Emissions at Be Lean Stage

Table 1: Regulated CO<sub>2</sub> Emissions Using SAP 2012 Carbon Factors

| Unit Type Description         | Unit Floor Area | Dwelling/Building Emissions Rate         | Target Emissions Rate                    | Dwelling/Building Emissions Rate | Target Emissions Rate    | Emissions Rate Improvement Over the Baseline |
|-------------------------------|-----------------|------------------------------------------|------------------------------------------|----------------------------------|--------------------------|----------------------------------------------|
| Non-Domestic                  | m <sup>2</sup>  | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /year         | kg CO <sub>2</sub> /year |                                              |
| Mary Feilding Guild Care Home | 5,680           | 55.3                                     | 77.3                                     | 314,121                          | 439,087                  | 28.5%                                        |

Table 2: Regulated CO<sub>2</sub> Emissions Using SAP 10 Carbon Factors

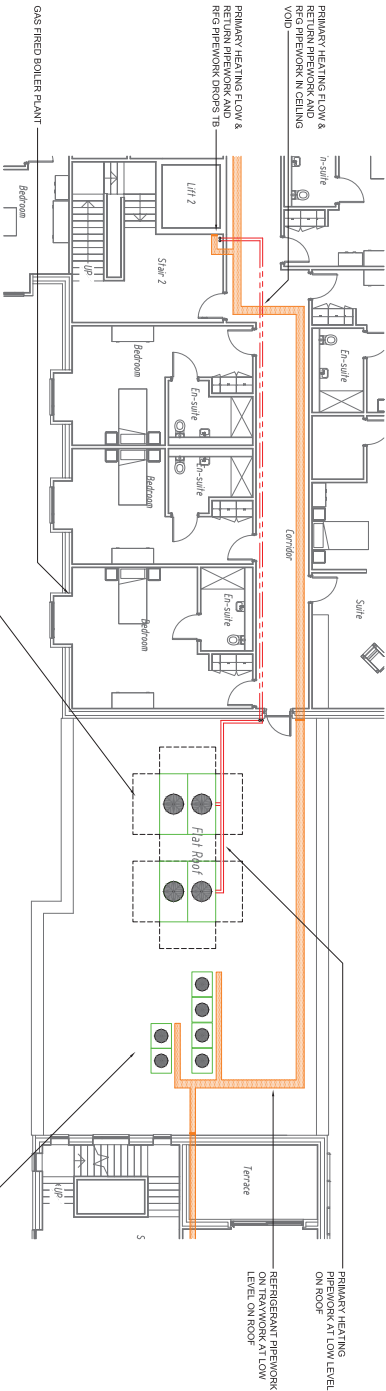
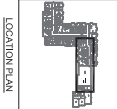
| Unit Type Description         | Unit Floor Area | Dwelling/Building Emissions Rate         | Target Emissions Rate                    | Dwelling/Building Emissions Rate | Target Emissions Rate    | Emissions Rate Improvement Over the Baseline |
|-------------------------------|-----------------|------------------------------------------|------------------------------------------|----------------------------------|--------------------------|----------------------------------------------|
| Non-Domestic                  | m <sup>2</sup>  | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /year         | kg CO <sub>2</sub> /year |                                              |
| Mary Feilding Guild Care Home | 5,680           | 46.70                                    | 66.10                                    | 265,270                          | 375,468                  | 29.3%                                        |

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## **APPENDIX E: ROOF LAYOUT SHOWING HEAT PUMPS**

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The drawings to accompany and must not be reproduced without the written permission of the author. All dimensions and locations should be checked on site. The drawings are for information only. The client is responsible for any changes and is subject to change.



2 IN AIR COOLED AIR SOURCE HEAT PUMPS PROVIDING PRIMARY HEATING TO RESIDENTS AND BACK OF HOUSE AREAS AND HOT WATER GENERATION  
EACH UNIT:  
2275L x 2100D x 1330H  
1020kg



EXTERNAL AIR COOLED VEV CONDENSERS PROVIDING HEATING AND COOLING TO COMMUNAL AND STAFF AREAS  
EACH CONDENSER:  
1660H x 530W x 765D  
230kg

Project No. 1629  
Drawing No. 1629-02  
Drawing Title: SECOND FLOOR ROOF PLANT LAYOUT  
Drawing Date: 15/10/21  
Drawing Scale: A1  
Drawing Status: PRELIMINARY  
Drawing No. SKM004  
Revision: P

Highgate Care Ltd

PROJECT

Highgate Care Home

DRAWING TITLE

SECOND FLOOR ROOF PLANT LAYOUT

DRAWN BY: A.M.W.

CHECKED BY: A.M.W.

DATE: 15/10/21

SCALE: A1

SIZE: A1

STATUS: PRELIMINARY

DRAWING NO. SKM004

REVISION: P

Project No. 1629  
Drawing No. 1629-02  
Drawing Title: SECOND FLOOR ROOF PLANT LAYOUT  
Drawing Date: 15/10/21  
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Revision: P

Highgate Care Ltd

PROJECT

Highgate Care Home

DRAWING TITLE

SECOND FLOOR ROOF PLANT LAYOUT

DRAWN BY: A.M.W.

CHECKED BY: A.M.W.

DATE: 15/10/21

SCALE: A1

SIZE: A1

STATUS: PRELIMINARY

DRAWING NO. SKM004

REVISION: P

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## **APPENDIX F: PLANT ROOM LAYOUT**

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## **APPENDIX G: BRUKL – *BE CLEAN* & GLA CARBON EMISSION REPORTING**

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The applicant should complete all the light blue cells including information on the 'best' energy consumption figures and the 'best' CO<sub>2</sub>e.

[illegible]

## Project name

**Highgate Care Home****As designed****Date:** Thu Nov 18 13:53:51 2021**Administrative information****Building Details****Address:** N6, London**Certification tool****Calculation engine:** SBEM**Calculation engine version:** v5.6.b.0**Interface to calculation engine:** DesignBuilder SBEM**Interface to calculation engine version:** v6.1.8**BRUKL compliance check version:** v5.6.b.0**Certifier details****Name:****Telephone number:****Address:** , ,**Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target**

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 67.8                |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 67.8                |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 44.9                |
| Are emissions from the building less than or equal to the target?                                  | BER =< TER          |
| Are as built details the same as used in the BER calculations?                                     | Separate submission |

**Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency**

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

**Building fabric**

| Element                                                                                                                                                                                                                                                                                                                                                                                                                                      | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | Surface where the maximum value occurs* |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|-----------------------------------------|
| Wall**                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.35                  | 0.19                 | 0.25                 | "00 Basement - Hair & Beauty Salon_P_7" |
| Floor                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.25                  | 0.12                 | 0.12                 | "00 Basement - Gym_S_3"                 |
| Roof                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.25                  | 0.15                 | 0.15                 | "04 Second Floor - Lounge_R_5"          |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                                                                                                                                                                                     | 2.2                   | 1.3                  | 1.3                  | "00 Basement - Gym_G_11"                |
| Personnel doors                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.2                   | 1.8                  | 1.8                  | "01 Ground Floor - Corridor_D_18"       |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                         | 1.5                   | -                    | -                    | "No external vehicle access doors"      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.5                   | -                    | -                    | "No external high usage entrance doors" |
| 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)]                                                                                                                                                            |                       |                      |                      |                                         |
| * There might be more than one surface where the maximum U-value occurs.<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.<br>N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                         |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 5             |

## Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

### 1- VRF

|                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                | 4.2                | 4                  | -                  | -             | -             |
| <b>Standard value</b>                                                                                                                                             | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                                              |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards. |                    |                    |                    |               |               |

### 2- Communal ASHP

|                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                | 3.15               | -                  | -                  | -             | -             |
| <b>Standard value</b>                                                                                                                                             | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                                              |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards. |                    |                    |                    |               |               |

### 1- Project DHW

|                                                                                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|--------------------------------------------------------------------------------|--------------------------|-----------------------------------------|
| <b>This building</b>                                                           | 1.87                     | 0                                       |
| <b>Standard value</b>                                                          | 2*                       | N/A                                     |
| * Standard shown is for all types except absorption and gas engine heat pumps. |                          |                                         |

## Local mechanical ventilation, exhaust, and terminal units

| ID | System type in Non-domestic Building Services Compliance Guide                                          |
|----|---------------------------------------------------------------------------------------------------------|
| A  | Local supply or extract ventilation units serving a single area                                         |
| 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 supply and extract ventilation units serving a single room or zone with heating and heat recovery |
| E  | Local supply and extract ventilation system serving a single area with heating and heat recovery        |
| F  | Other local ventilation units                                                                           |
| G  | Fan-assisted terminal VAV unit                                                                          |
| H  | Fan coil units                                                                                          |
| I  | Zonal extract system where the fan is remote from the zone with grease filter                           |

| 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 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 |  | Zone          | Standard |
| 00 Basement - Gym                 | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Chefs Office        | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Consult             | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Cinema room         | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Office              | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Hair & Beauty Salon | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Barbers             | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |

| 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 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| 00 Basement - Wellness Shop                | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 02 First Floor - Treatment & Medical Room  | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 02 First Floor - Treatment & Medical Rooms | 2             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 02 First Floor - Treatment & Medical Rooms | 1             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 02 First Floor - Staff Room                | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 02 First Floor - Lounge                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 02 First Floor - Dinning                   | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 04 Second Floor - Lounge                   | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 04 Second Floor - Dining                   | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 01 Ground Floor - Meet & Greet             | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 01 Ground Floor - Cafe                     | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 01 Ground Floor - Admin                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 01 Ground Floor - Restaurant               | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 01 Ground Floor - Manager                  | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 00 Basement - Male Changing room           | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - Female Change                | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - Reception                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 00 Basement - Laundry                      | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - Kitchen                      | -             | -   | -   | -   | -   | -   | -   | -   | 1 | -             | N/A      |
| 00 Basement - Kitchen Staff Change         | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - WC                           | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - Change                       | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - WC                           | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - Change                       | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 00 Basement - Kosher Kitchen               | -             | -   | -   | -   | -   | -   | -   | -   | 1 | -             | N/A      |
| 00 Basement - Reception                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85          | 0.5      |
| 02 First Floor - Ensuite 1                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 2                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 3                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - WC 1                      | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 4                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Spa                       | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Staff Change              | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 6                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 7                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 8                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 9                 | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 10                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 11                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 12                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 13                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 14                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |
| 02 First Floor - Ensuite 15                | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -             | N/A      |

[illegible]

| General lighting and display lighting        |                | Luminous efficacy [lm/W] |      |              |                      |
|----------------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                                    |                | Luminaire                | Lamp | Display lamp | General lighting [W] |
|                                              | Standard value | 60                       | 60   | 22           |                      |
| 00 Basement - Gym                            |                | -                        | 110  | -            | 381                  |
| 00 Basement - Chefs Office                   |                | 110                      | -    | -            | 63                   |
| 00 Basement - Consult                        |                | 110                      | -    | -            | 445                  |
| 00 Basement - Cinema room                    |                | -                        | 110  | -            | 185                  |
| 00 Basement - Office                         |                | 110                      | -    | -            | 107                  |
| 00 Basement - Comms                          |                | 110                      | -    | -            | 39                   |
| 00 Basement - Hair & Beauty Salon            |                | -                        | 110  | 110          | 286                  |
| 00 Basement - Barbers                        |                | -                        | 110  | 110          | 284                  |
| 00 Basement - Wellness Shop                  |                | -                        | 110  | 110          | 215                  |
| 02 First Floor - Treatment & Medical Room    |                | 110                      | -    | -            | 127                  |
| 02 First Floor - Treatment & Medical Rooms 2 |                | 110                      | -    | -            | 221                  |
| 02 First Floor - Treatment & Medical Rooms 1 |                | 110                      | -    | -            | 152                  |
| 02 First Floor - Staff Room                  |                | -                        | 110  | -            | 57                   |
| 02 First Floor - Lounge                      |                | -                        | 110  | -            | 238                  |
| 02 First Floor - Dinning                     |                | -                        | 110  | -            | 105                  |
| 04 Second Floor - Lounge                     |                | -                        | 110  | -            | 181                  |
| 04 Second Floor - Dining                     |                | -                        | 110  | -            | 118                  |
| 01 Ground Floor - Meet & Greet               |                | 110                      | -    | -            | 81                   |
| 01 Ground Floor - Cafe                       |                | -                        | 110  | -            | 122                  |
| 01 Ground Floor - Admin                      |                | 110                      | -    | -            | 151                  |
| 01 Ground Floor - Restaurant                 |                | -                        | 110  | -            | 198                  |
| 01 Ground Floor - Servery                    |                | -                        | 110  | 110          | 44                   |
| 01 Ground Floor - Manager                    |                | 110                      | -    | -            | 102                  |
| 00 Basement - Corridor                       |                | -                        | 110  | -            | 252                  |
| 00 Basement - Lift & Stairs                  |                | -                        | 110  | -            | 58                   |
| 00 Basement - Male Changing room             |                | -                        | 110  | -            | 30                   |
| 00 Basement - Female Change                  |                | -                        | 110  | -            | 40                   |
| 00 Basement - Stairs & Lobby                 |                | -                        | 110  | -            | 73                   |
| 00 Basement - Corridor                       |                | -                        | 110  | -            | 89                   |
| 00 Basement - Lobby                          |                | -                        | 110  | -            | 120                  |
| 00 Basement - Maintenance Store              |                | 110                      | -    | -            | 36                   |
| 00 Basement - Hydro plant room               |                | 110                      | -    | -            | 54                   |
| 00 Basement - Sauna                          |                | 110                      | -    | -            | 118                  |
| 00 Basement - Hydro Pool                     |                | -                        | 110  | -            | 214                  |
| 00 Basement - Reception                      |                | -                        | 110  | 110          | 132                  |
| 00 Basement - Plant Room                     |                | 110                      | -    | -            | 168                  |
| 00 Basement - Handyman                       |                | 110                      | -    | -            | 135                  |
| 00 Basement - Stair & Lift                   |                | -                        | 110  | -            | 62                   |
| 00 Basement - Laundry                        |                | -                        | 110  | -            | 330                  |
| 00 Basement - Kitchen                        |                | -                        | 110  | -            | 293                  |
| 00 Basement - Kitchen Staff Change           |                | -                        | 110  | -            | 28                   |
| 00 Basement - WC                             |                | -                        | 110  | -            | 33                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 00 Basement - Lobby                   |                | -                        | 100  | -            | 38                   |
| 00 Basement - Change                  |                | -                        | 110  | -            | 31                   |
| 00 Basement - WC                      |                | -                        | 110  | -            | 30                   |
| 00 Basement - Change                  |                | -                        | 110  | -            | 32                   |
| 00 Basement - Equipment Store         |                | 110                      | -    | -            | 46                   |
| 00 Basement - Kosher Kitchen          |                | -                        | 110  | -            | 111                  |
| 00 Basement - Kitchen Store           |                | 110                      | -    | -            | 37                   |
| 00 Basement - Reception               |                | -                        | 110  | 110          | 85                   |
| 02 First Floor - Corridor             |                | -                        | 110  | -            | 479                  |
| 02 First Floor - Bedroom              |                | -                        | 110  | -            | 316                  |
| 02 First Floor - Ensuite 1            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 2            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 3            |                | -                        | 110  | -            | 40                   |
| 02 First Floor - Linen                |                | 110                      | -    | -            | 11                   |
| 02 First Floor - Linen                |                | 110                      | -    | -            | 11                   |
| 02 First Floor - Store                |                | 110                      | -    | -            | 49                   |
| 02 First Floor - WC 1                 |                | -                        | 110  | -            | 34                   |
| 02 First Floor - Nurse Station        |                | 110                      | -    | -            | 81                   |
| 02 First Floor - Stairs & Lift        |                | -                        | 110  | -            | 56                   |
| 02 First Floor - Ensuite 4            |                | -                        | 110  | -            | 24                   |
| 02 First Floor - Medication Store     |                | 110                      | -    | -            | 27                   |
| 02 First Floor - Spa                  |                | -                        | 110  | -            | 52                   |
| 02 First Floor - Hoist                |                | 110                      | -    | -            | 31                   |
| 02 First Floor - Staff Change         |                | -                        | 110  | -            | 32                   |
| 02 First Floor - Bedrooms 2           |                | -                        | 110  | -            | 189                  |
| 02 First Floor - Bedrooms 3           |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 6            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Bedrooms 4           |                | -                        | 110  | -            | 216                  |
| 02 First Floor - Ensuite 7            |                | -                        | 110  | -            | 20                   |
| 02 First Floor - Ensuite 8            |                | -                        | 110  | -            | 24                   |
| 02 First Floor - Store & Linen        |                | 110                      | -    | -            | 35                   |
| 02 First Floor - Ensuite 9            |                | -                        | 110  | -            | 26                   |
| 02 First Floor - Bedrooms 5           |                | -                        | 110  | -            | 140                  |
| 02 First Floor - Ensuite 10           |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Bedrooms 6           |                | -                        | 110  | -            | 129                  |
| 02 First Floor - Bedrooms 7           |                | -                        | 110  | -            | 43                   |
| 02 First Floor - Ensuite 11           |                | -                        | 110  | -            | 30                   |
| 02 First Floor - Ensuite 12           |                | -                        | 110  | -            | 22                   |
| 02 First Floor - Ensuite 13           |                | -                        | 110  | -            | 23                   |
| 02 First Floor - Bedrooms 8           |                | -                        | 110  | -            | 51                   |
| 02 First Floor - Ensuite 14           |                | -                        | 110  | -            | 34                   |
| 02 First Floor - Bedrooms 9           |                | -                        | 110  | -            | 50                   |
| 02 First Floor - Bedrooms             |                | -                        | 110  | -            | 62                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 02 First Floor - Ensuite 15           |                | -                        | 110  | -            | 21                   |
| 02 First Floor - Stairs & Lift        |                | -                        | 110  | -            | 58                   |
| 02 First Floor - Ensuite              |                | -                        | 110  | -            | 37                   |
| 02 First Floor - WC 2                 |                | -                        | 110  | -            | 29                   |
| 02 First Floor - WC                   |                | -                        | 110  | -            | 29                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 99                   |
| 03 Second Floor - Stairs & Lift       |                | -                        | 110  | -            | 64                   |
| 03 Second Floor - Corridor            |                | -                        | 110  | -            | 29                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 54                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 91                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 23                   |
| 05 Third Floor - Stair & Lift         |                | -                        | 110  | -            | 60                   |
| 05 Third Floor - Lobby                |                | -                        | 110  | -            | 28                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 63                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 41                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 19                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 71                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 20                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 19                   |
| 04 Second Floor - Bedroom             |                | -                        | 110  | -            | 142                  |
| 04 Second Floor - Corridor            |                | -                        | 110  | -            | 365                  |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 166                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Stair & Lift        |                | -                        | 110  | -            | 58                   |
| 04 Second Floor - Nurse station       |                | 110                      | -    | -            | 89                   |
| 04 Second Floor - Medical Store       |                | 110                      | -    | -            | 30                   |
| 04 Second Floor - Spa                 |                | -                        | 110  | -            | 62                   |
| 04 Second Floor - Hoist               |                | 110                      | -    | -            | 33                   |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 423                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 23                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Store               |                | 110                      | -    | -            | 15                   |
| 04 Second Floor - WC                  |                | -                        | 110  | -            | 35                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 28                   |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 153                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Stair & Lift        |                | -                        | 110  | -            | 59                   |

| General lighting and display lighting   |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|-----------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                               |                | Luminaire                | Lamp | Display lamp |                      |
|                                         | Standard value | 60                       | 60   | 22           |                      |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 24                   |
| 04 Second Floor - Bedroom               |                | -                        | 110  | -            | 73                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 33                   |
| 04 Second Floor - Bedroom               |                | -                        | 110  | -            | 49                   |
| 04 Second Floor - WC                    |                | -                        | 110  | -            | 35                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 38                   |
| 04 Second Floor - Bedrooms              |                | -                        | 110  | -            | 56                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 53                   |
| 01 Ground Floor - Cafe Store            |                | 110                      | -    | -            | 10                   |
| 01 Ground Floor - Reception             |                | -                        | 110  | 110          | 148                  |
| 01 Ground Floor - Foyer & Central Hub 1 |                | -                        | 110  | -            | 86                   |
| 01 Ground Floor - Bedroom 1             |                | -                        | 110  | -            | 310                  |
| 01 Ground Floor - Ensuite 1             |                | -                        | 110  | -            | 24                   |
| 01 Ground Floor - Stair & lift 1        |                | -                        | 110  | -            | 64                   |
| 01 Ground Floor - Ensuite 2             |                | -                        | 110  | -            | 40                   |
| 01 Ground Floor - Linen 1               |                | 110                      | -    | -            | 12                   |
| 01 Ground Floor - Corridor              |                | -                        | 110  | -            | 352                  |
| 01 Ground Floor - Linen                 |                | 110                      | -    | -            | 11                   |
| 01 Ground Floor - WC 1                  |                | -                        | 110  | -            | 35                   |
| 01 Ground Floor - Foyer & Central Hub 2 |                | -                        | 110  | -            | 232                  |
| 01 Ground Floor - Lobby                 |                | -                        | 110  | -            | 16                   |
| 01 Ground Floor - Bedrooms 1            |                | -                        | 110  | -            | 193                  |
| 01 Ground Floor - Ensuite 3             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Bin Store             |                | 110                      | -    | -            | 52                   |
| 01 Ground Floor - Medication Store      |                | 110                      | -    | -            | 26                   |
| 01 Ground Floor - Stair & lift 2        |                | -                        | 110  | -            | 61                   |
| 01 Ground Floor - Nurse                 |                | 110                      | -    | -            | 81                   |
| 01 Ground Floor - Ensuite 4             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Ensuite 5             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Store                 |                | 110                      | -    | -            | 33                   |
| 01 Ground Floor - WCs 2                 |                | -                        | 110  | -            | 68                   |
| 01 Ground Floor - Ensuite 6             |                | -                        | 110  | -            | 32                   |
| 01 Ground Floor - Bedrooms 2            |                | -                        | 110  | -            | 43                   |
| 01 Ground Floor - Bedrooms 3            |                | -                        | 110  | -            | 219                  |
| 01 Ground Floor - Ensuite 7             |                | -                        | 110  | -            | 23                   |
| 01 Ground Floor - Ensuite 8             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Ensuite 9             |                | -                        | 110  | -            | 23                   |
| 01 Ground Floor - Ensuite 10            |                | -                        | 110  | -            | 26                   |
| 01 Ground Floor - Ensuite               |                | -                        | 110  | -            | 38                   |
| 01 Ground Floor - Stair & Lift          |                | -                        | 110  | -            | 57                   |
| 01 Ground Floor - WC                    |                | -                        | 110  | -            | 28                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              |
|---------------------------------------|----------------|--------------------------|------|--------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |
|                                       | Standard value | 60                       | 60   | 22           |
| 01 Ground Floor - Bedroom             |                | -                        | 110  | -            |
|                                       |                |                          |      | 52           |

### Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

| Zone                                         | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------------------|--------------------------------|-----------------------|
| 00 Basement - Gym                            | NO (-58.2%)                    | NO                    |
| 00 Basement - Chefs Office                   | N/A                            | N/A                   |
| 00 Basement - Consult                        | N/A                            | N/A                   |
| 00 Basement - Cinema room                    | N/A                            | N/A                   |
| 00 Basement - Office                         | N/A                            | N/A                   |
| 00 Basement - Comms                          | N/A                            | N/A                   |
| 00 Basement - Hair & Beauty Salon            | N/A                            | N/A                   |
| 00 Basement - Barbers                        | N/A                            | N/A                   |
| 00 Basement - Wellness Shop                  | N/A                            | N/A                   |
| 02 First Floor - Treatment & Medical Room    | NO (-70.8%)                    | NO                    |
| 02 First Floor - Treatment & Medical Rooms 2 | NO (-71.8%)                    | NO                    |
| 02 First Floor - Treatment & Medical Rooms 1 | NO (-64.6%)                    | NO                    |
| 02 First Floor - Staff Room                  | NO (-76.7%)                    | NO                    |
| 02 First Floor - Lounge                      | NO (-50.6%)                    | NO                    |
| 02 First Floor - Dinning                     | NO (-65.1%)                    | NO                    |
| 04 Second Floor - Lounge                     | NO (-39.4%)                    | NO                    |
| 04 Second Floor - Dining                     | NO (-83.7%)                    | NO                    |
| 01 Ground Floor - Meet & Greet               | NO (-87%)                      | NO                    |
| 01 Ground Floor - Cafe                       | NO (-72.8%)                    | NO                    |
| 01 Ground Floor - Admin                      | NO (-61.5%)                    | NO                    |
| 01 Ground Floor - Restaurant                 | NO (-53%)                      | NO                    |
| 01 Ground Floor - Servery                    | N/A                            | N/A                   |
| 01 Ground Floor - Manager                    | NO (-12.3%)                    | NO                    |
| 00 Basement - Sauna                          | N/A                            | N/A                   |
| 00 Basement - Hydro Pool                     | N/A                            | N/A                   |
| 00 Basement - Reception                      | N/A                            | N/A                   |
| 00 Basement - Handyman                       | N/A                            | N/A                   |
| 00 Basement - Reception                      | N/A                            | N/A                   |
| 02 First Floor - Bedroom                     | NO (-66.7%)                    | NO                    |
| 02 First Floor - Ensuite 1                   | N/A                            | N/A                   |
| 02 First Floor - Ensuite 2                   | N/A                            | N/A                   |
| 02 First Floor - Ensuite 3                   | N/A                            | N/A                   |
| 02 First Floor - Nurse Station               | N/A                            | N/A                   |
| 02 First Floor - Ensuite 4                   | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 2                  | NO (-74%)                      | NO                    |
| 02 First Floor - Bedrooms 3                  | N/A                            | N/A                   |
| 02 First Floor - Ensuite 6                   | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 4                  | NO (-68.9%)                    | NO                    |
| 02 First Floor - Ensuite 7                   | N/A                            | N/A                   |

| Zone                            | Solar gain limit exceeded? (%) | Internal blinds used? |
|---------------------------------|--------------------------------|-----------------------|
| 02 First Floor - Ensuite 8      | N/A                            | N/A                   |
| 02 First Floor - Ensuite 9      | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 5     | NO (-52.1%)                    | NO                    |
| 02 First Floor - Ensuite 10     | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 6     | NO (-67.9%)                    | NO                    |
| 02 First Floor - Bedrooms 7     | NO (-86%)                      | NO                    |
| 02 First Floor - Ensuite 11     | NO (-87.3%)                    | NO                    |
| 02 First Floor - Ensuite 12     | N/A                            | N/A                   |
| 02 First Floor - Ensuite 13     | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 8     | NO (-53.8%)                    | NO                    |
| 02 First Floor - Ensuite 14     | NO (-85.7%)                    | NO                    |
| 02 First Floor - Bedrooms 9     | NO (-80.3%)                    | NO                    |
| 02 First Floor - Bedrooms       | NO (-70.7%)                    | NO                    |
| 02 First Floor - Ensuite 15     | N/A                            | N/A                   |
| 02 First Floor - Ensuite        | N/A                            | N/A                   |
| 03 Second Floor - Bedroom       | NO (-71.7%)                    | NO                    |
| 03 Second Floor - Bedroom       | NO (-70.7%)                    | NO                    |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 03 Second Floor - Bedroom       | NO (-83%)                      | NO                    |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 05 Third Floor - Bedroom        | NO (-83%)                      | NO                    |
| 05 Third Floor - Bedroom        | NO (-86.2%)                    | NO                    |
| 05 Third Floor - Ensuite        | NO (-73.9%)                    | NO                    |
| 05 Third Floor - Bedroom        | NO (-76.7%)                    | NO                    |
| 05 Third Floor - Ensuite        | NO (-72%)                      | NO                    |
| 05 Third Floor - Ensuite        | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-78.5%)                    | NO                    |
| 04 Second Floor - Bedrooms      | NO (-83%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Nurse station | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-77%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-79%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-82.4%)                    | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-90.1%)                    | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-81.2%)                    | NO                    |

| Zone                         | Solar gain limit exceeded? (%) | Internal blinds used? |
|------------------------------|--------------------------------|-----------------------|
| 04 Second Floor - Ensuite    | NO (-90.7%)                    | NO                    |
| 01 Ground Floor - Reception  | NO (-71%)                      | NO                    |
| 01 Ground Floor - Bedroom 1  | NO (-42.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 1  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 2  | N/A                            | N/A                   |
| 01 Ground Floor - Bedrooms 1 | NO (-75.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 3  | N/A                            | N/A                   |
| 01 Ground Floor - Nurse      | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 4  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 5  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 6  | NO (-82.6%)                    | NO                    |
| 01 Ground Floor - Bedrooms 2 | NO (-92.1%)                    | NO                    |
| 01 Ground Floor - Bedrooms 3 | NO (-62.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 7  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 8  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 9  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 10 | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite    | N/A                            | N/A                   |
| 01 Ground Floor - Bedroom    | NO (-52.4%)                    | NO                    |

#### Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

#### Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

#### EPBD (Recast): Consideration of alternative energy systems

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Area [m <sup>2</sup> ]                                | 5680.3  | 5680.3   |
| External area [m <sup>2</sup> ]                       | 6680.4  | 6680.4   |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 5       | 3        |
| Average conductance [W/K]                             | 1852.68 | 3500.88  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.28    | 0.52     |
| Alpha value* [%]                                      | 17.79   | 14       |

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

## Building Use

| % Area | Building Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2      | <b>A1/A2 Retail/Financial and Professional services</b><br>A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways<br>B1 Offices and Workshop businesses<br>B2 to B7 General Industrial and Special Industrial Groups<br>B8 Storage or Distribution<br>C1 Hotels                                                                                                                                                                                                                          |
| 90     | <b>C2 Residential Institutions: Hospitals and Care Homes</b>                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3      | <b>C2 Residential Institutions: Residential schools</b><br>C2 Residential Institutions: Universities and colleges<br>C2A Secure Residential Institutions<br>Residential spaces<br>D1 Non-residential Institutions: Community/Day Centre<br>D1 Non-residential Institutions: Libraries, Museums, and Galleries<br>D1 Non-residential Institutions: Education<br>D1 Non-residential Institutions: Primary Health Care Building<br>D1 Non-residential Institutions: Crown and County Courts |
| 4      | <b>D2 General Assembly and Leisure, Night Clubs, and Theatres</b><br>Others: Passenger terminals<br>Others: Emergency services<br>Others: Miscellaneous 24hr activities<br>Others: Car Parks 24 hrs<br>Others: Stand alone utility block                                                                                                                                                                                                                                                 |

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

|                 | Actual        | Notional     |
|-----------------|---------------|--------------|
| Heating         | 8.86          | 14.96        |
| Cooling         | 3.42          | 5.82         |
| Auxiliary       | 11.24         | 9.89         |
| Lighting        | 12.03         | 18.3         |
| Hot water       | 80.06         | 125.22       |
| Equipment*      | 52.48         | 52.48        |
| <b>TOTAL **</b> | <b>115.61</b> | <b>174.2</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      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 258.24 | 381.3    |
| Primary energy* [kWh/m <sup>2</sup> ]         | 263.09 | 397.11   |
| Total emissions [kg/m <sup>2</sup> ]          | 44.9   | 67.8     |

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

| 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>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |      |
| [ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity            |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                          | Actual            | 9                 | 308.9              | 0.6                | 17.7              | 11.6          | 4.12          | 4.86             | 4.2              | 6.5  |
|                                                                                                                          | Notional          | 25                | 389.6              | 2.9                | 30.1              | 10.5          | 2.43          | 3.6              | ----             | ---- |
| [ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Natural Gas |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                          | Actual            | 115.4             | 128.5              | 10.8               | 0                 | 11.1          | 2.96          | 0                | 3.15             | 0    |
|                                                                                                                          | Notional          | 156.3             | 217                | 17.9               | 0                 | 9.8           | 2.43          | 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                                                                                   |

# Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

## Building fabric

| Element                                                                  | U <sub>i-Typ</sub> | U <sub>i-Min</sub>                                                 | Surface where the minimum value occurs* |
|--------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|-----------------------------------------|
| Wall                                                                     | 0.23               | 0.18                                                               | "00 Basement - Gym_W_10"                |
| Floor                                                                    | 0.2                | 0.12                                                               | "00 Basement - Gym_S_3"                 |
| Roof                                                                     | 0.15               | 0.15                                                               | "04 Second Floor - Lounge_R_5"          |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.3                                                                | "00 Basement - Gym_G_11"                |
| Personnel doors                                                          | 1.5                | 1.8                                                                | "01 Ground Floor - Corridor_D_18"       |
| Vehicle access & similar large doors                                     | 1.5                | -                                                                  | "No external vehicle access doors"      |
| High usage entrance doors                                                | 1.5                | -                                                                  | "No external high usage entrance doors" |
| U <sub>i-Typ</sub> = Typical individual element U-values [W/(m²K)]       |                    | U <sub>i-Min</sub> = Minimum individual element U-values [W/(m²K)] |                                         |
| * There might be more than one surface where the minimum U-value occurs. |                    |                                                                    |                                         |

| Air Permeability   | Typical value | This building |
|--------------------|---------------|---------------|
| m³/(h.m²) at 50 Pa | 5             | 5             |

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## **APPENDIX H: CO<sub>2</sub> EMISSIONS SUMMARY – BE CLEAN**

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CO<sub>2</sub> Emissions at Be Clean StageTable 1: Regulated CO<sub>2</sub> Emissions Using SAP 2012 Carbon Factors

| Unit Type Description         | Unit Floor Area | Building Emissions Rate                  | Target Emissions Rate                    | Building Emissions Rate  | Target Emissions Rate    | Emissions Rate Improvement Over <i>Be Lean</i> |
|-------------------------------|-----------------|------------------------------------------|------------------------------------------|--------------------------|--------------------------|------------------------------------------------|
| Non-Domestic                  | m <sup>2</sup>  | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /year | kg CO <sub>2</sub> /year |                                                |
| Mary Feilding Guild Care Home | 5,680           | 44.90                                    | 77.30                                    | 255,045                  | 439,087                  | 13.5%                                          |

Table 2: Regulated CO<sub>2</sub> Emissions Using SAP 10 Carbon Factors

| Unit Type Description         | Unit Floor Area | Building Emissions Rate                  | Target Emissions Rate                    | Building Emissions Rate  | Target Emissions Rate    | Emissions Rate Improvement Over <i>Be Lean</i> |
|-------------------------------|-----------------|------------------------------------------|------------------------------------------|--------------------------|--------------------------|------------------------------------------------|
| Non-Domestic                  | m <sup>2</sup>  | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /year | kg CO <sub>2</sub> /year |                                                |
| Mary Feilding Guild Care Home | 5,680           | 25.40                                    | 66.10                                    | 144,280                  | 375,468                  | 32.2%                                          |

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## **APPENDIX I: RENEWABLE AND LOW CARBON TECHNOLOGY FEASIBILITY**

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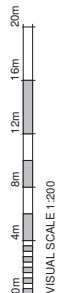
# Appendix I - Low Carbon and Renewable Energy Technology Feasibility Study

| Feasibility Study Table                 |                              |           |                                                    |                                         |               |                |                                        |          |                                                                                              |
|-----------------------------------------|------------------------------|-----------|----------------------------------------------------|-----------------------------------------|---------------|----------------|----------------------------------------|----------|----------------------------------------------------------------------------------------------|
| Technology                              | Sufficient Energy Generated? | Payback   | Land Use Issues                                    | Local Planning Requirements             | Noise         | Carbon Payback | Available Grants                       | Feasible | Reason not Feasible or Selected                                                              |
| <b>Combined Heat &amp; Power (CHP)</b>  | No                           | Medium    | Air quality in residential area                    | Encouraged for large scale developments | In Plant Room | Yes            | Tax Relief - ECA, RHI                  | No       | Not selected because it is not policy compliant technology.                                  |
| <b>Biomass</b>                          | Yes                          | None      | Air quality in residential area                    | Encouraged for large scale developments | In Plant Room | Yes            | RHI; Bio-energy Capital Grants Scheme  | No       | Not selected due to air quality concerns                                                     |
| <b>Solar Thermal</b>                    | Yes                          | High      | Sufficient roof space required                     | Encouraged                              | None          | ~2 years       | RHI                                    | Yes      | Not selected because PV has been preferred.                                                  |
| <b>Solar Photovoltaic (PV)</b>          | Yes                          | Very High | Sufficient roof space required                     | Encouraged                              | None          | 2-5 years      | FIT longer available since March 2019. | Yes      | Selected and 14kWp specified for the development                                             |
| <b>Ground Source Heat Pumps (GSHPs)</b> | Yes                          | Very High | Requires large area for coils or borehole          | Encouraged                              | None          | Low            | RHI                                    | No       | Not selected due to complexity and high cost associated with the ground excavation work.     |
| <b>Air Source Heat Pumps (ASHPs)</b>    | Yes                          | Very High | Visual intrusion of external units                 | Encouraged                              | Low           | Low            | RHI                                    | Yes      | Selected and is providing the space heating, cooling and majority of hot water requirements. |
| <b>Wind Power</b>                       | No                           | Low       | Urban Area - low and turbulent wind; Visual impact | Encouraged for large scale developments | Yes           | ~1 year        | FIT longer available since March 2019. | No       | Not selected due to insufficient wind speeds in area                                         |
| <b>Hydro Power</b>                      | No                           | Medium    | Requires suitable water resource; Visual impact    | None                                    | Low           | ~1 year        | FIT longer available since March 2019. | No       | Not selected due to high cost and insufficient water levels during some periods of the year  |

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## **APPENDIX J: PV LAYOUT**

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## **APPENDIX K: BRUKL – *BE GREEN* & GLA CARBON EMISSION REPORTING**

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## Project name

**Highgate Care Home****As designed****Date:** Thu Nov 18 14:10:35 2021**Administrative information****Building Details****Address:** N6, London**Certification tool****Calculation engine:** SBEM**Calculation engine version:** v5.6.b.0**Interface to calculation engine:** DesignBuilder SBEM**Interface to calculation engine version:** v6.1.8**BRUKL compliance check version:** v5.6.b.0**Certifier details****Name:****Telephone number:****Address:** , ,**Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target**

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 67.8                |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 67.8                |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 43.9                |
| Are emissions from the building less than or equal to the target?                                  | BER =< TER          |
| Are as built details the same as used in the BER calculations?                                     | Separate submission |

**Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency**

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

**Building fabric**

| Element                                                                                                                                                                                                                                                                                                                                                                                                                                      | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | Surface where the maximum value occurs* |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|-----------------------------------------|
| Wall**                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.35                  | 0.19                 | 0.25                 | "00 Basement - Hair & Beauty Salon_P_7" |
| Floor                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.25                  | 0.12                 | 0.12                 | "00 Basement - Gym_S_3"                 |
| Roof                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.25                  | 0.15                 | 0.15                 | "04 Second Floor - Lounge_R_5"          |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                                                                                                                                                                                     | 2.2                   | 1.3                  | 1.3                  | "00 Basement - Gym_G_11"                |
| Personnel doors                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.2                   | 1.8                  | 1.8                  | "01 Ground Floor - Corridor_D_18"       |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                         | 1.5                   | -                    | -                    | "No external vehicle access doors"      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.5                   | -                    | -                    | "No external high usage entrance doors" |
| 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)]                                                                                                                                                            |                       |                      |                      |                                         |
| * There might be more than one surface where the maximum U-value occurs.<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.<br>N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                         |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 5             |

## Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

### 1- VRF

|                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                | 4.2                | 4                  | -                  | -             | -             |
| <b>Standard value</b>                                                                                                                                             | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                                              |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards. |                    |                    |                    |               |               |

### 2- Communal ASHP

|                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                | 3.15               | -                  | -                  | -             | -             |
| <b>Standard value</b>                                                                                                                                             | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                                              |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards. |                    |                    |                    |               |               |

### 1- Project DHW

|                                                                                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|--------------------------------------------------------------------------------|--------------------------|-----------------------------------------|
| <b>This building</b>                                                           | 1.87                     | 0                                       |
| <b>Standard value</b>                                                          | 2*                       | N/A                                     |
| * Standard shown is for all types except absorption and gas engine heat pumps. |                          |                                         |

### Local mechanical ventilation, exhaust, and terminal units

| ID | System type in Non-domestic Building Services Compliance Guide                                          |
|----|---------------------------------------------------------------------------------------------------------|
| A  | Local supply or extract ventilation units serving a single area                                         |
| 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 supply and extract ventilation units serving a single room or zone with heating and heat recovery |
| E  | Local supply and extract ventilation system serving a single area with heating and heat recovery        |
| F  | Other local ventilation units                                                                           |
| G  | Fan-assisted terminal VAV unit                                                                          |
| H  | Fan coil units                                                                                          |
| I  | Zonal extract system where the fan is remote from the zone with grease filter                           |

| 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 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 |  |               |          |
| 00 Basement - Gym                 | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Chefs Office        | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Consult             | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Cinema room         | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Office              | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Hair & Beauty Salon | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |
| 00 Basement - Barbers             | -             | -   | -   | 1   | -   | -   | -   | -   | - |  | 0.85          | 0.5      |

| 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 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone | Standard      |  |
| 00 Basement - Wellness Shop                  | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Treatment & Medical Room    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Treatment & Medical Rooms 2 | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Treatment & Medical Rooms 4 | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Staff Room                  | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Lounge                      | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Dinning                     | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 04 Second Floor - Lounge                     | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 04 Second Floor - Dining                     | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Meet & Greet               | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Cafe                       | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Admin                      | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Restaurant                 | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 01 Ground Floor - Manager                    | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Male Changing room             | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Female Change                  | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Reception                      | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 00 Basement - Laundry                        | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Kitchen                        | -             | -   | -   | -   | -   | -   | -   | -   | 1 | -    | N/A           |  |
| 00 Basement - Kitchen Staff Change           | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - WC                             | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Change                         | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - WC                             | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Change                         | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 00 Basement - Kosher Kitchen                 | -             | -   | -   | -   | -   | -   | -   | -   | 1 | -    | N/A           |  |
| 00 Basement - Reception                      | -             | -   | -   | 1   | -   | -   | -   | -   | - | 0.85 | 0.5           |  |
| 02 First Floor - Ensuite 1                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 2                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 3                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - WC 1                        | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 4                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Spa                         | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Staff Change                | -             | -   | 0.3 | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 6                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 7                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 8                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 9                   | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 10                  | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 11                  | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 12                  | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 13                  | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 14                  | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |
| 02 First Floor - Ensuite 15                  | 0.3           | -   | -   | -   | -   | -   | -   | -   | - | -    | N/A           |  |

[illegible]

| General lighting and display lighting        |                | Luminous efficacy [lm/W] |      |              |                      |
|----------------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                                    |                | Luminaire                | Lamp | Display lamp | General lighting [W] |
|                                              | Standard value | 60                       | 60   | 22           |                      |
| 00 Basement - Gym                            |                | -                        | 110  | -            | 381                  |
| 00 Basement - Chefs Office                   |                | 110                      | -    | -            | 63                   |
| 00 Basement - Consult                        |                | 110                      | -    | -            | 445                  |
| 00 Basement - Cinema room                    |                | -                        | 110  | -            | 185                  |
| 00 Basement - Office                         |                | 110                      | -    | -            | 107                  |
| 00 Basement - Comms                          |                | 110                      | -    | -            | 39                   |
| 00 Basement - Hair & Beauty Salon            |                | -                        | 110  | 110          | 286                  |
| 00 Basement - Barbers                        |                | -                        | 110  | 110          | 284                  |
| 00 Basement - Wellness Shop                  |                | -                        | 110  | 110          | 215                  |
| 02 First Floor - Treatment & Medical Room    |                | 110                      | -    | -            | 127                  |
| 02 First Floor - Treatment & Medical Rooms 2 |                | 110                      | -    | -            | 221                  |
| 02 First Floor - Treatment & Medical Rooms 1 |                | 110                      | -    | -            | 152                  |
| 02 First Floor - Staff Room                  |                | -                        | 110  | -            | 57                   |
| 02 First Floor - Lounge                      |                | -                        | 110  | -            | 238                  |
| 02 First Floor - Dinning                     |                | -                        | 110  | -            | 105                  |
| 04 Second Floor - Lounge                     |                | -                        | 110  | -            | 181                  |
| 04 Second Floor - Dining                     |                | -                        | 110  | -            | 118                  |
| 01 Ground Floor - Meet & Greet               |                | 110                      | -    | -            | 81                   |
| 01 Ground Floor - Cafe                       |                | -                        | 110  | -            | 122                  |
| 01 Ground Floor - Admin                      |                | 110                      | -    | -            | 151                  |
| 01 Ground Floor - Restaurant                 |                | -                        | 110  | -            | 198                  |
| 01 Ground Floor - Servery                    |                | -                        | 110  | 110          | 44                   |
| 01 Ground Floor - Manager                    |                | 110                      | -    | -            | 102                  |
| 00 Basement - Corridor                       |                | -                        | 110  | -            | 252                  |
| 00 Basement - Lift & Stairs                  |                | -                        | 110  | -            | 58                   |
| 00 Basement - Male Changing room             |                | -                        | 110  | -            | 30                   |
| 00 Basement - Female Change                  |                | -                        | 110  | -            | 40                   |
| 00 Basement - Stairs & Lobby                 |                | -                        | 110  | -            | 73                   |
| 00 Basement - Corridor                       |                | -                        | 110  | -            | 89                   |
| 00 Basement - Lobby                          |                | -                        | 110  | -            | 120                  |
| 00 Basement - Maintenance Store              |                | 110                      | -    | -            | 36                   |
| 00 Basement - Hydro plant room               |                | 110                      | -    | -            | 54                   |
| 00 Basement - Sauna                          |                | 110                      | -    | -            | 118                  |
| 00 Basement - Hydro Pool                     |                | -                        | 110  | -            | 214                  |
| 00 Basement - Reception                      |                | -                        | 110  | 110          | 132                  |
| 00 Basement - Plant Room                     |                | 110                      | -    | -            | 168                  |
| 00 Basement - Handyman                       |                | 110                      | -    | -            | 135                  |
| 00 Basement - Stair & Lift                   |                | -                        | 110  | -            | 62                   |
| 00 Basement - Laundry                        |                | -                        | 110  | -            | 330                  |
| 00 Basement - Kitchen                        |                | -                        | 110  | -            | 293                  |
| 00 Basement - Kitchen Staff Change           |                | -                        | 110  | -            | 28                   |
| 00 Basement - WC                             |                | -                        | 110  | -            | 33                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 00 Basement - Lobby                   |                | -                        | 100  | -            | 38                   |
| 00 Basement - Change                  |                | -                        | 110  | -            | 31                   |
| 00 Basement - WC                      |                | -                        | 110  | -            | 30                   |
| 00 Basement - Change                  |                | -                        | 110  | -            | 32                   |
| 00 Basement - Equipment Store         |                | 110                      | -    | -            | 46                   |
| 00 Basement - Kosher Kitchen          |                | -                        | 110  | -            | 111                  |
| 00 Basement - Kitchen Store           |                | 110                      | -    | -            | 37                   |
| 00 Basement - Reception               |                | -                        | 110  | 110          | 85                   |
| 02 First Floor - Corridor             |                | -                        | 110  | -            | 479                  |
| 02 First Floor - Bedroom              |                | -                        | 110  | -            | 316                  |
| 02 First Floor - Ensuite 1            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 2            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 3            |                | -                        | 110  | -            | 40                   |
| 02 First Floor - Linen                |                | 110                      | -    | -            | 11                   |
| 02 First Floor - Linen                |                | 110                      | -    | -            | 11                   |
| 02 First Floor - Store                |                | 110                      | -    | -            | 49                   |
| 02 First Floor - WC 1                 |                | -                        | 110  | -            | 34                   |
| 02 First Floor - Nurse Station        |                | 110                      | -    | -            | 81                   |
| 02 First Floor - Stairs & Lift        |                | -                        | 110  | -            | 56                   |
| 02 First Floor - Ensuite 4            |                | -                        | 110  | -            | 24                   |
| 02 First Floor - Medication Store     |                | 110                      | -    | -            | 27                   |
| 02 First Floor - Spa                  |                | -                        | 110  | -            | 52                   |
| 02 First Floor - Hoist                |                | 110                      | -    | -            | 31                   |
| 02 First Floor - Staff Change         |                | -                        | 110  | -            | 32                   |
| 02 First Floor - Bedrooms 2           |                | -                        | 110  | -            | 189                  |
| 02 First Floor - Bedrooms 3           |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Ensuite 6            |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Bedrooms 4           |                | -                        | 110  | -            | 216                  |
| 02 First Floor - Ensuite 7            |                | -                        | 110  | -            | 20                   |
| 02 First Floor - Ensuite 8            |                | -                        | 110  | -            | 24                   |
| 02 First Floor - Store & Linen        |                | 110                      | -    | -            | 35                   |
| 02 First Floor - Ensuite 9            |                | -                        | 110  | -            | 26                   |
| 02 First Floor - Bedrooms 5           |                | -                        | 110  | -            | 140                  |
| 02 First Floor - Ensuite 10           |                | -                        | 110  | -            | 37                   |
| 02 First Floor - Bedrooms 6           |                | -                        | 110  | -            | 129                  |
| 02 First Floor - Bedrooms 7           |                | -                        | 110  | -            | 43                   |
| 02 First Floor - Ensuite 11           |                | -                        | 110  | -            | 30                   |
| 02 First Floor - Ensuite 12           |                | -                        | 110  | -            | 22                   |
| 02 First Floor - Ensuite 13           |                | -                        | 110  | -            | 23                   |
| 02 First Floor - Bedrooms 8           |                | -                        | 110  | -            | 51                   |
| 02 First Floor - Ensuite 14           |                | -                        | 110  | -            | 34                   |
| 02 First Floor - Bedrooms 9           |                | -                        | 110  | -            | 50                   |
| 02 First Floor - Bedrooms             |                | -                        | 110  | -            | 62                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 02 First Floor - Ensuite 15           |                | -                        | 110  | -            | 21                   |
| 02 First Floor - Stairs & Lift        |                | -                        | 110  | -            | 58                   |
| 02 First Floor - Ensuite              |                | -                        | 110  | -            | 37                   |
| 02 First Floor - WC 2                 |                | -                        | 110  | -            | 29                   |
| 02 First Floor - WC                   |                | -                        | 110  | -            | 29                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 99                   |
| 03 Second Floor - Stairs & Lift       |                | -                        | 110  | -            | 64                   |
| 03 Second Floor - Corridor            |                | -                        | 110  | -            | 29                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 54                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 03 Second Floor - Bedroom             |                | -                        | 110  | -            | 91                   |
| 03 Second Floor - Ensuite             |                | -                        | 110  | -            | 23                   |
| 05 Third Floor - Stair & Lift         |                | -                        | 110  | -            | 60                   |
| 05 Third Floor - Lobby                |                | -                        | 110  | -            | 28                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 63                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 41                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 19                   |
| 05 Third Floor - Bedroom              |                | -                        | 110  | -            | 71                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 20                   |
| 05 Third Floor - Ensuite              |                | -                        | 110  | -            | 19                   |
| 04 Second Floor - Bedroom             |                | -                        | 110  | -            | 142                  |
| 04 Second Floor - Corridor            |                | -                        | 110  | -            | 365                  |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 166                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Stair & Lift        |                | -                        | 110  | -            | 58                   |
| 04 Second Floor - Nurse station       |                | 110                      | -    | -            | 89                   |
| 04 Second Floor - Medical Store       |                | 110                      | -    | -            | 30                   |
| 04 Second Floor - Spa                 |                | -                        | 110  | -            | 62                   |
| 04 Second Floor - Hoist               |                | 110                      | -    | -            | 33                   |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 423                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 23                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Store               |                | 110                      | -    | -            | 15                   |
| 04 Second Floor - WC                  |                | -                        | 110  | -            | 35                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 28                   |
| 04 Second Floor - Bedrooms            |                | -                        | 110  | -            | 153                  |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Ensuite             |                | -                        | 110  | -            | 41                   |
| 04 Second Floor - Stair & Lift        |                | -                        | 110  | -            | 59                   |

| General lighting and display lighting   |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|-----------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                               |                | Luminaire                | Lamp | Display lamp |                      |
|                                         | Standard value | 60                       | 60   | 22           |                      |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 24                   |
| 04 Second Floor - Bedroom               |                | -                        | 110  | -            | 73                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 26                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 33                   |
| 04 Second Floor - Bedroom               |                | -                        | 110  | -            | 49                   |
| 04 Second Floor - WC                    |                | -                        | 110  | -            | 35                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 38                   |
| 04 Second Floor - Bedrooms              |                | -                        | 110  | -            | 56                   |
| 04 Second Floor - Ensuite               |                | -                        | 110  | -            | 53                   |
| 01 Ground Floor - Cafe Store            |                | 110                      | -    | -            | 10                   |
| 01 Ground Floor - Reception 1           |                | -                        | 110  | 110          | 59                   |
| 01 Ground Floor - Foyer & Central Hub 1 |                | -                        | 110  | -            | 86                   |
| 01 Ground Floor - Bedroom 1             |                | -                        | 110  | -            | 310                  |
| 01 Ground Floor - Ensuite 1             |                | -                        | 110  | -            | 24                   |
| 01 Ground Floor - Stair & lift 1        |                | -                        | 110  | -            | 64                   |
| 01 Ground Floor - Ensuite 2             |                | -                        | 110  | -            | 40                   |
| 01 Ground Floor - Linen 1               |                | 110                      | -    | -            | 12                   |
| 01 Ground Floor - Corridor              |                | -                        | 110  | -            | 352                  |
| 01 Ground Floor - Linen                 |                | 110                      | -    | -            | 11                   |
| 01 Ground Floor - WC 1                  |                | -                        | 110  | -            | 35                   |
| 01 Ground Floor - Reception             |                | -                        | 110  | -            | 232                  |
| 01 Ground Floor - Lobby                 |                | -                        | 110  | -            | 16                   |
| 01 Ground Floor - Bedrooms 1            |                | -                        | 110  | -            | 193                  |
| 01 Ground Floor - Ensuite 3             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Bin Store             |                | 110                      | -    | -            | 52                   |
| 01 Ground Floor - Medication Store      |                | 110                      | -    | -            | 26                   |
| 01 Ground Floor - Stair & lift 2        |                | -                        | 110  | -            | 61                   |
| 01 Ground Floor - Nurse                 |                | 110                      | -    | -            | 81                   |
| 01 Ground Floor - Ensuite 4             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Ensuite 5             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Store                 |                | 110                      | -    | -            | 33                   |
| 01 Ground Floor - WCs 2                 |                | -                        | 110  | -            | 68                   |
| 01 Ground Floor - Ensuite 6             |                | -                        | 110  | -            | 32                   |
| 01 Ground Floor - Bedrooms 2            |                | -                        | 110  | -            | 43                   |
| 01 Ground Floor - Bedrooms 3            |                | -                        | 110  | -            | 219                  |
| 01 Ground Floor - Ensuite 7             |                | -                        | 110  | -            | 23                   |
| 01 Ground Floor - Ensuite 8             |                | -                        | 110  | -            | 37                   |
| 01 Ground Floor - Ensuite 9             |                | -                        | 110  | -            | 23                   |
| 01 Ground Floor - Ensuite 10            |                | -                        | 110  | -            | 26                   |
| 01 Ground Floor - Ensuite               |                | -                        | 110  | -            | 38                   |
| 01 Ground Floor - Stair & Lift          |                | -                        | 110  | -            | 57                   |
| 01 Ground Floor - WC                    |                | -                        | 110  | -            | 28                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              |
|---------------------------------------|----------------|--------------------------|------|--------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |
|                                       | Standard value | 60                       | 60   | 22           |
| 01 Ground Floor - Bedroom             |                | -                        | 110  | -            |
|                                       |                |                          |      | 52           |

### Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

| Zone                                         | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------------------|--------------------------------|-----------------------|
| 00 Basement - Gym                            | NO (-58.2%)                    | NO                    |
| 00 Basement - Chefs Office                   | N/A                            | N/A                   |
| 00 Basement - Consult                        | N/A                            | N/A                   |
| 00 Basement - Cinema room                    | N/A                            | N/A                   |
| 00 Basement - Office                         | N/A                            | N/A                   |
| 00 Basement - Comms                          | N/A                            | N/A                   |
| 00 Basement - Hair & Beauty Salon            | N/A                            | N/A                   |
| 00 Basement - Barbers                        | N/A                            | N/A                   |
| 00 Basement - Wellness Shop                  | N/A                            | N/A                   |
| 02 First Floor - Treatment & Medical Room    | NO (-70.8%)                    | NO                    |
| 02 First Floor - Treatment & Medical Rooms 2 | NO (-71.8%)                    | NO                    |
| 02 First Floor - Treatment & Medical Rooms 1 | NO (-64.6%)                    | NO                    |
| 02 First Floor - Staff Room                  | NO (-76.7%)                    | NO                    |
| 02 First Floor - Lounge                      | NO (-50.6%)                    | NO                    |
| 02 First Floor - Dinning                     | NO (-65.1%)                    | NO                    |
| 04 Second Floor - Lounge                     | NO (-39.4%)                    | NO                    |
| 04 Second Floor - Dining                     | NO (-83.7%)                    | NO                    |
| 01 Ground Floor - Meet & Greet               | NO (-87%)                      | NO                    |
| 01 Ground Floor - Cafe                       | NO (-72.8%)                    | NO                    |
| 01 Ground Floor - Admin                      | NO (-61.5%)                    | NO                    |
| 01 Ground Floor - Restaurant                 | NO (-53%)                      | NO                    |
| 01 Ground Floor - Servery                    | N/A                            | N/A                   |
| 01 Ground Floor - Manager                    | NO (-12.3%)                    | NO                    |
| 00 Basement - Sauna                          | N/A                            | N/A                   |
| 00 Basement - Hydro Pool                     | N/A                            | N/A                   |
| 00 Basement - Reception                      | N/A                            | N/A                   |
| 00 Basement - Handyman                       | N/A                            | N/A                   |
| 00 Basement - Reception                      | N/A                            | N/A                   |
| 02 First Floor - Bedroom                     | NO (-66.7%)                    | NO                    |
| 02 First Floor - Ensuite 1                   | N/A                            | N/A                   |
| 02 First Floor - Ensuite 2                   | N/A                            | N/A                   |
| 02 First Floor - Ensuite 3                   | N/A                            | N/A                   |
| 02 First Floor - Nurse Station               | N/A                            | N/A                   |
| 02 First Floor - Ensuite 4                   | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 2                  | NO (-74%)                      | NO                    |
| 02 First Floor - Bedrooms 3                  | N/A                            | N/A                   |
| 02 First Floor - Ensuite 6                   | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 4                  | NO (-68.9%)                    | NO                    |
| 02 First Floor - Ensuite 7                   | N/A                            | N/A                   |

| Zone                            | Solar gain limit exceeded? (%) | Internal blinds used? |
|---------------------------------|--------------------------------|-----------------------|
| 02 First Floor - Ensuite 8      | N/A                            | N/A                   |
| 02 First Floor - Ensuite 9      | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 5     | NO (-52.1%)                    | NO                    |
| 02 First Floor - Ensuite 10     | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 6     | NO (-67.9%)                    | NO                    |
| 02 First Floor - Bedrooms 7     | NO (-86%)                      | NO                    |
| 02 First Floor - Ensuite 11     | NO (-87.3%)                    | NO                    |
| 02 First Floor - Ensuite 12     | N/A                            | N/A                   |
| 02 First Floor - Ensuite 13     | N/A                            | N/A                   |
| 02 First Floor - Bedrooms 8     | NO (-53.8%)                    | NO                    |
| 02 First Floor - Ensuite 14     | NO (-85.7%)                    | NO                    |
| 02 First Floor - Bedrooms 9     | NO (-80.3%)                    | NO                    |
| 02 First Floor - Bedrooms       | NO (-70.7%)                    | NO                    |
| 02 First Floor - Ensuite 15     | N/A                            | N/A                   |
| 02 First Floor - Ensuite        | N/A                            | N/A                   |
| 03 Second Floor - Bedroom       | NO (-71.7%)                    | NO                    |
| 03 Second Floor - Bedroom       | NO (-70.7%)                    | NO                    |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 03 Second Floor - Bedroom       | NO (-83%)                      | NO                    |
| 03 Second Floor - Ensuite       | N/A                            | N/A                   |
| 05 Third Floor - Bedroom        | NO (-83%)                      | NO                    |
| 05 Third Floor - Bedroom        | NO (-86.2%)                    | NO                    |
| 05 Third Floor - Ensuite        | NO (-73.9%)                    | NO                    |
| 05 Third Floor - Bedroom        | NO (-76.7%)                    | NO                    |
| 05 Third Floor - Ensuite        | NO (-72%)                      | NO                    |
| 05 Third Floor - Ensuite        | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-78.5%)                    | NO                    |
| 04 Second Floor - Bedrooms      | NO (-83%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Nurse station | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-77%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-79%)                      | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-82.4%)                    | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedroom       | NO (-90.1%)                    | NO                    |
| 04 Second Floor - Ensuite       | N/A                            | N/A                   |
| 04 Second Floor - Bedrooms      | NO (-81.2%)                    | NO                    |

| Zone                          | Solar gain limit exceeded? (%) | Internal blinds used? |
|-------------------------------|--------------------------------|-----------------------|
| 04 Second Floor - Ensuite     | NO (-90.7%)                    | NO                    |
| 01 Ground Floor - Reception 1 | NO (-71%)                      | NO                    |
| 01 Ground Floor - Bedroom 1   | NO (-42.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 1   | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 2   | N/A                            | N/A                   |
| 01 Ground Floor - Bedrooms 1  | NO (-75.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 3   | N/A                            | N/A                   |
| 01 Ground Floor - Nurse       | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 4   | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 5   | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 6   | NO (-82.6%)                    | NO                    |
| 01 Ground Floor - Bedrooms 2  | NO (-92.1%)                    | NO                    |
| 01 Ground Floor - Bedrooms 3  | NO (-62.4%)                    | NO                    |
| 01 Ground Floor - Ensuite 7   | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 8   | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 9   | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite 10  | N/A                            | N/A                   |
| 01 Ground Floor - Ensuite     | N/A                            | N/A                   |
| 01 Ground Floor - Bedroom     | NO (-52.4%)                    | NO                    |

#### Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

#### Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

#### EPBD (Recast): Consideration of alternative energy systems

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Area [m <sup>2</sup> ]                                | 5680.3  | 5680.3   |
| External area [m <sup>2</sup> ]                       | 6680.4  | 6680.4   |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 5       | 3        |
| Average conductance [W/K]                             | 1852.68 | 3500.88  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.28    | 0.52     |
| Alpha value* [%]                                      | 17.79   | 14       |

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

## Building Use

| % Area    | Building Type                                                      |
|-----------|--------------------------------------------------------------------|
| <b>2</b>  | <b>A1/A2 Retail/Financial and Professional services</b>            |
|           | A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways             |
|           | B1 Offices and Workshop businesses                                 |
|           | B2 to B7 General Industrial and Special Industrial Groups          |
|           | B8 Storage or Distribution                                         |
|           | C1 Hotels                                                          |
| <b>90</b> | <b>C2 Residential Institutions: Hospitals and Care Homes</b>       |
| <b>3</b>  | <b>C2 Residential Institutions: Residential schools</b>            |
|           | C2 Residential Institutions: Universities and colleges             |
|           | C2A Secure Residential Institutions                                |
|           | Residential spaces                                                 |
|           | D1 Non-residential Institutions: Community/Day Centre              |
|           | D1 Non-residential Institutions: Libraries, Museums, and Galleries |
|           | D1 Non-residential Institutions: Education                         |
|           | D1 Non-residential Institutions: Primary Health Care Building      |
|           | D1 Non-residential Institutions: Crown and County Courts           |
| <b>4</b>  | <b>D2 General Assembly and Leisure, Night Clubs, and Theatres</b>  |
|           | 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         | 8.87          | 14.95         |
| Cooling         | 3.42          | 5.82          |
| Auxiliary       | 11.24         | 9.89          |
| Lighting        | 11.95         | 18.21         |
| Hot water       | 80.06         | 125.22        |
| Equipment*      | 52.31         | 52.31         |
| <b>TOTAL **</b> | <b>115.55</b> | <b>174.09</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  | 1.86   | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 257.91 | 380.4    |
| Primary energy* [kWh/m <sup>2</sup> ]         | 262.89 | 396.79   |
| Total emissions [kg/m <sup>2</sup> ]          | 43.9   | 67.8     |

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

| 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>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |  |
| [ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity            |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                                                   | 9                 | 308.9             | 0.6                | 17.7               | 11.6              | 4.12          | 4.86          | 4.2              | 6.5              |  |
| Notional                                                                                                                 | 25                | 389.6             | 2.9                | 30.1               | 10.5              | 2.43          | 3.6           | ----             | ----             |  |
| [ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Natural Gas |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                                                   | 115.6             | 127.9             | 10.9               | 0                  | 11.1              | 2.96          | 0             | 3.15             | 0                |  |
| Notional                                                                                                                 | 156.2             | 216               | 17.9               | 0                  | 9.8               | 2.43          | 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                                                                                   |

# Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

## Building fabric

| Element                                                                  | U <sub>i-Typ</sub> | U <sub>i-Min</sub>                                                 | Surface where the minimum value occurs* |
|--------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|-----------------------------------------|
| Wall                                                                     | 0.23               | 0.18                                                               | "00 Basement - Gym_W_10"                |
| Floor                                                                    | 0.2                | 0.12                                                               | "00 Basement - Gym_S_3"                 |
| Roof                                                                     | 0.15               | 0.15                                                               | "04 Second Floor - Lounge_R_5"          |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.3                                                                | "00 Basement - Gym_G_11"                |
| Personnel doors                                                          | 1.5                | 1.8                                                                | "01 Ground Floor - Corridor_D_18"       |
| Vehicle access & similar large doors                                     | 1.5                | -                                                                  | "No external vehicle access doors"      |
| High usage entrance doors                                                | 1.5                | -                                                                  | "No external high usage entrance doors" |
| U <sub>i-Typ</sub> = Typical individual element U-values [W/(m²K)]       |                    | U <sub>i-Min</sub> = Minimum individual element U-values [W/(m²K)] |                                         |
| * There might be more than one surface where the minimum U-value occurs. |                    |                                                                    |                                         |

| Air Permeability   | Typical value | This building |
|--------------------|---------------|---------------|
| m³/(h.m²) at 50 Pa | 5             | 5             |

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## **APPENDIX L: CO<sub>2</sub> EMISSIONS SUMMARY – *BE GREEN***

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CO<sub>2</sub> Emissions at Be Green StageTable 1: Regulated CO<sub>2</sub> Emissions Using SAP 2012 Carbon Factors

| Unit Type Description         | Unit Floor Area | Building Emissions Rate                  | Target Emissions Rate                    | Building Emissions Rate  | Target Emissions Rate    | Emissions Rate Improvement Over<br><i>Be Green</i> |
|-------------------------------|-----------------|------------------------------------------|------------------------------------------|--------------------------|--------------------------|----------------------------------------------------|
| Non-Domestic                  | m <sup>2</sup>  | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /year | kg CO <sub>2</sub> /year |                                                    |
| Mary Feilding Guild Care Home | 5,680           | 43.90                                    | 77.30                                    | 249,365                  | 439,087                  | 1.3%                                               |

Table 2: Regulated CO<sub>2</sub> Emissions Using SAP 10 Carbon Factors

| Unit Type Description         | Unit Floor Area | Building Emissions Rate                  | Target Emissions Rate                    | Building Emissions Rate  | Target Emissions Rate    | Emissions Rate Improvement Over<br><i>Be Green</i> |
|-------------------------------|-----------------|------------------------------------------|------------------------------------------|--------------------------|--------------------------|----------------------------------------------------|
| Non-Domestic                  | m <sup>2</sup>  | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /m <sup>2</sup> /year | kg CO <sub>2</sub> /year | kg CO <sub>2</sub> /year |                                                    |
| Mary Feilding Guild Care Home | 5,680           | 25.00                                    | 66.10                                    | 142,008                  | 375,468                  | 0.6%                                               |