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Energy & Sustainability Statement

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1.0 EXECUTIVE SUMMARY

The proposed development project at 807 High Road is a new four storeys to include purpose-built student accommodation (Sui Generis) and flexible commercial, business and service uses (Class E), with a GIA of 1,292.6sqm.

The building has been designed to achieve the highest of environmental performance standards following the Energy Hierarchy as set down by the London Plan. This report describes the approach and measures adopted within the design of the proposed Scheme to show how the Proposed Development could comply with Building Regulations as well as London Plan and Haringey council Local Plan energy requirements.

The energy assessment follows the GLA Energy Assessment Guidance (June 2022)

- Establishes compliance with Building Regulations Part L, primarily that the building emission rate (BER) is less than the target emission rate (TER);
- Propose strategy to comply with the London Plan (2021) energy hierarchy 'Be Lean, be clean, be green, and be seen'.
- Propose strategy to comply with the Haringey council's new Local Plan Energy requirements.
- Demonstrate procedures adopted in the proposed Scheme to reduce the cooling demand, by following the Cooling Hierarchy, whilst also ensuring the risk from overheating is reduced.

Our analysis has consisted of :-

- Calculating the energy demand and CO₂ emissions reductions that can be reached in the development by employing energy reduction techniques using software modelling.
- Investigating the viability of renewable energy technologies and their contribution to achieving CO₂ emission reductions
- The proposed energy strategy aligns with Net Zero Carbon Pathway and aims to reduce the natural gas usage and switch to an electric solution.

In summary, this report concludes that there are two viable scenarios for providing the buildings primary heating demand, which are with and without a connection to a local district heat network (DEN). Whilst a connection to a DEN is favoured in terms of planning and carbon emission, the nearest DEN connection is currently still a planned future development which will not be operational until after this proposed development is completed.

As a result throughout this report we have calculated and presented results for both scenarios, with and without the future DEN.

- Scenario 1 – With a DEN connection
- Scenario 2 – With heating provided by air source heat pumps (ASHP).

In summary, this report confirms that, for the combined development: -

- The proposed construction will emit less CO₂ than the minimum requirement building due to passive design features, such as the provision of high levels of thermal insulation and air-tightness and energy efficient systems.
- Additional savings in emissions will also be saved through the use of solar Photovoltaic panels.
- The above represents a total carbon reduction of 86.5% for the DEN or 15.6% for the ASHP over the Part L2 2021 baseline.

The cover note to the GLA's Energy Assessment Guidance (June 2022 update) does acknowledge that non-residential developments may find it more challenging to achieve significant onsite carbon reductions beyond Part L 2021 to meet both the energy efficiency target and the minimum 35 per cent improvement. In such cases, development should demonstrate alignment to the energy hierarchy to minimise emissions as far as possible before offsetting. In the instances where it is not possible to achieve the requirements of Policy SI2, full compliance is achieved with the more recent Energy Assessment Guidance.

- All the residual regulated carbon emissions will be offset via a cash in lieu payments. The carbon emissions reduction achieved are maximum feasible with onsite measures

considering the existing nature, acoustic and air quality requirements, and location of the site.

Table 1a: DEN - Carbon dioxide reduction summary:

	Carbon dioxide emissions for non-domestic buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulation Compliant Development	53.6	5.1
After energy demand reduction (Fabric improvement)	53.0	5.1
After energy demand reduction & Heat network	7.82	5.1
After Renewables	7.22	5.1

Table 1b: ASHP - Carbon dioxide reduction summary:

	Carbon dioxide emissions for non-domestic buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulation Compliant Development	14.6	5.1
After energy demand reduction (Fabric improvement)	13.5	5.1
After energy demand reduction (Heat pump)	12.9	5.1
After Renewables (Onsite generation)	12.28	5.1

Table 2a: DEN - Carbon dioxide savings:

	Regulated non-domestic Carbon Dioxide Savings	
	Tonnes CO ₂ per annum	Percentage
Savings from energy demand reduction	0.6	1.1%
Savings from heat network/CHP	45.2	84.3%
Saving from renewable energy	0.6	1.1%
Total Cumulative Savings	46.38	86.5%

Table 2b: ASHP - Carbon dioxide savings:

	Regulated non-domestic Carbon Dioxide Savings	
	Tonnes CO ₂ per annum	Percentage
Savings from energy demand reduction	1.1	8%
Be Lean: saving form Fabric efficiency	0.6	4%
Savings from heat network/CHP	n/a	n/a
Saving from renewable energy	0.6	4.1%
Total Cumulative Savings	2.27	16%

Figure 1a: DEN - The Non-Domestic Energy Hierarchy:

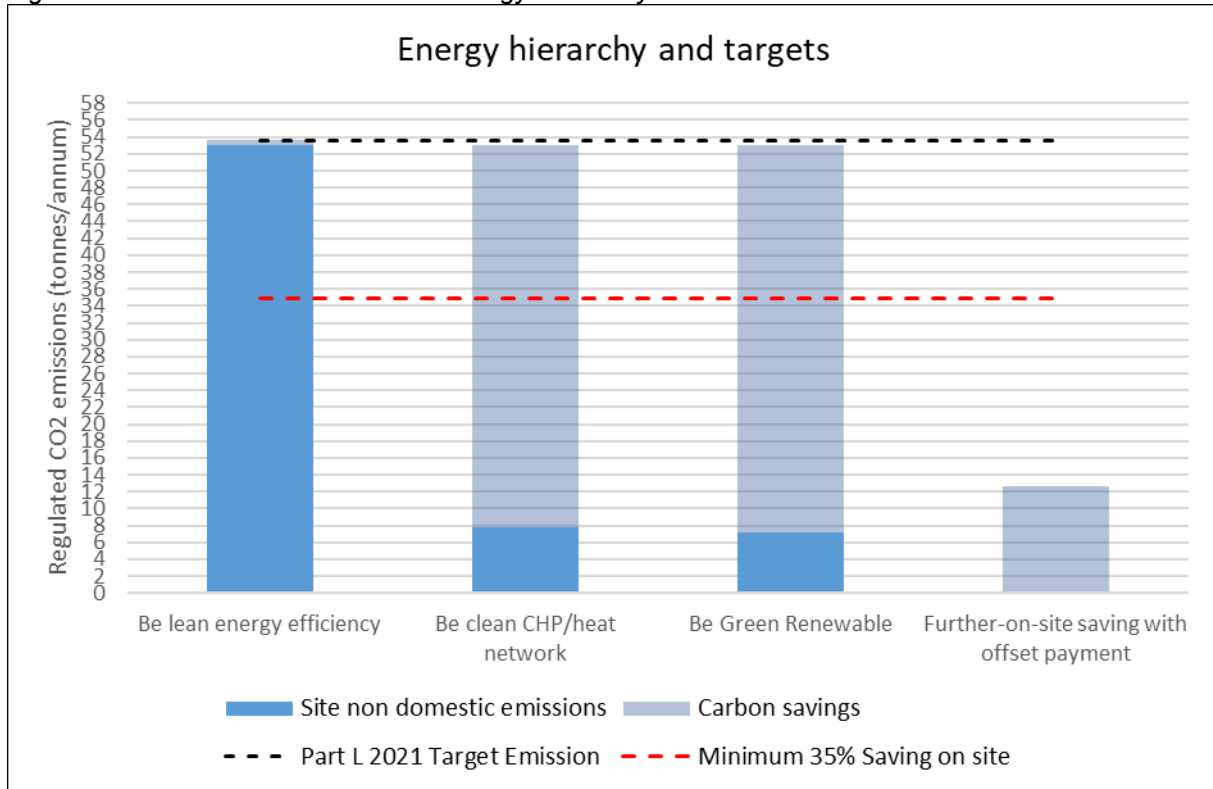
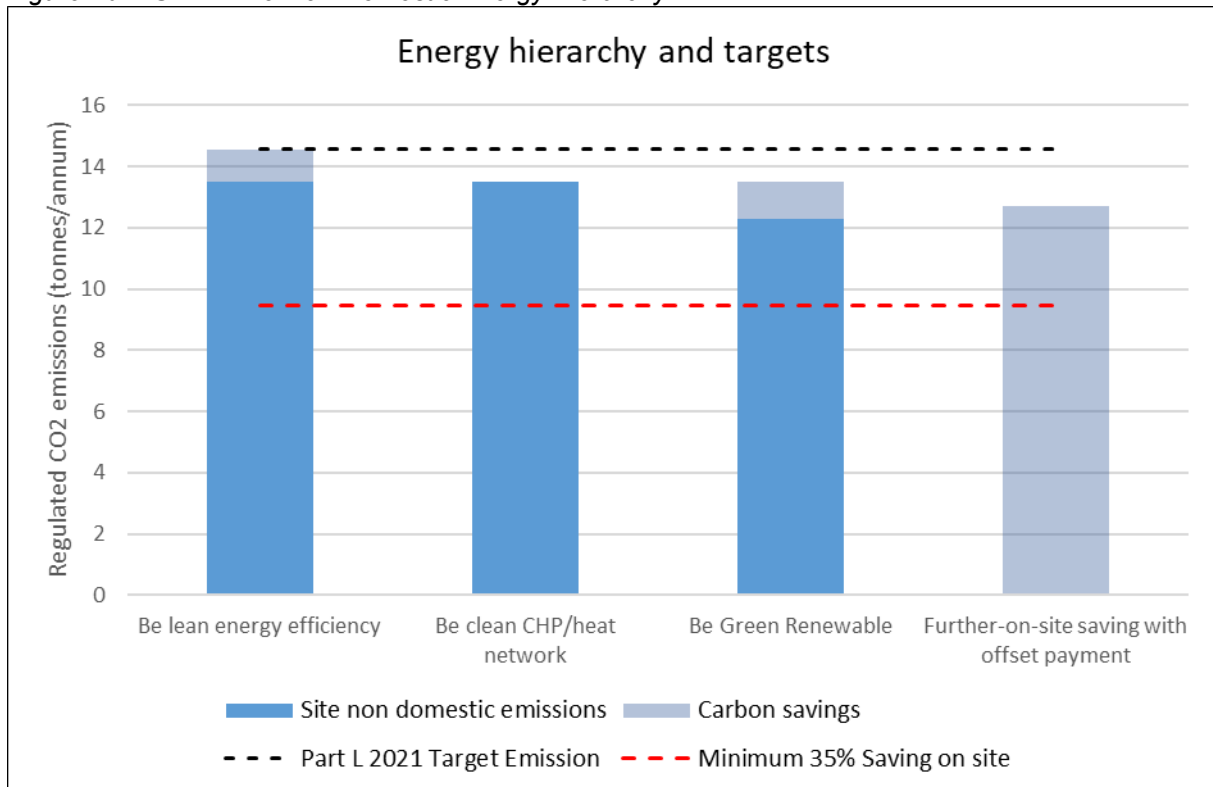


Figure 1b: ASHP - The Non-Domestic Energy Hierarchy:



2.0 INTRODUCTION

2.1 Scope

This report describes how the proposed development at 807 High Road achieves savings in energy and carbon dioxide emissions (CO₂) following a deliberately ordered strategy of measures to reduce energy consumption and using necessary energy more efficiently.

This development is a 4 storied mixed-use building, ground floor consists of a retail/commercial space (Class E) and amenity areas and upper floor consists of purpose-built student accommodation. The energy statement describes how this new development complies with London Plan and local plan.

2.2 Policy

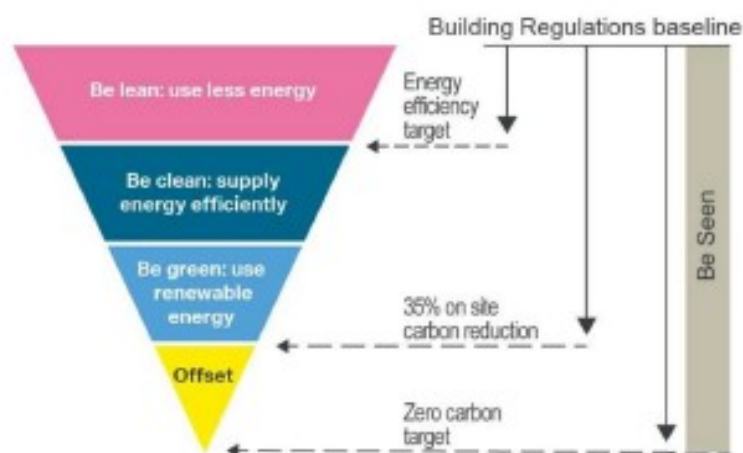
The London Plan (2021) requires major development to be net zero carbon, applying an energy hierarchy to achieve this of be lean, be clean, be green and be seen (explained below). A minimum on-site reduction of at least 35% beyond Building Regulations (Part L 2021) is required, with non-residential development to achieve 15% through energy efficiency measures. Where zero carbon cannot be achieved on-site, any shortfall can be provided through a cash in lieu contribution or off-site delivery.

The London Plan (2021) Policy SI2 encourages the conservation of energy in buildings by a defined energy hierarchy which should be implemented in the following order:

The new London Plan (2021) Policy shows that GLA

- 1- Be Lean – Use less energy, by adopting sustainable design and construction measures. Commercial buildings shall achieve minimum 15% through this step.
- 2- Be Clean - Supply energy efficiently, by prioritising decentralised energy generation.
- 3- Be Green - Use renewable energy for on site generation.
- 4- Be seen, Monitor, verify and report on energy performance.

Figure 1: The London Plan energy hierarchy



2.3 Local Policy

The site is located within London Borough of Haringey, the local plans sets out sustainability and energy policies in alignment with the New London Plan. The Council aims to reduce the carbon footprint of development in Haringey. This includes the efficient implementation of an energy hierarchy in building design and construction, the use of energy from more efficient sources such as decentralised energy networks (or making connections to such networks feasible in the future) and by requiring the generation of energy on-site by use of renewable energy.

Strategic Policies 2013-2026

SP4 Working towards a Low Carbon Haringey.

In line with London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction and occupation, by incorporating the following measures:

- From 2011 onwards, all new residential development will achieve a minimum 25% reduction in total (regulated) CO2 emissions in line with Code for Sustainable Homes Level 4 energy standards and should aim to achieve Level 6. 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” or the current nationally agreed standard. All new non-residential development shall be zero carbon from 2019.

The Council will promote low and zero-carbon energy generation through the following measures:

- Requiring all developments to assess, identify and implement, where viable, site-wide and area-wide decentralised energy facilities including the potential to link into a wider network.
- Establishing local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible.
- Working with neighbouring boroughs and other partners to explore ways of implementing sub-regional decentralised energy networks including the potential in the Upper Lee Valley Opportunity Area
- All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from onsite renewable energy regeneration, which can include connections to local sources of decentralised renewable energy.

Development Management DPD 2017

DM21 Sustainable Design, Layout and Construction

- All new development, including building and landscape works, will be expected to consider and implement sustainable design, layout and construction techniques. Proposals should: a. Apply the energy hierarchy to minimise energy use in order to meet, and if possible, exceed, minimum carbon dioxide reduction requirements. Apply the cooling hierarchy to reduce the potential for overheating and limit reliance on mechanical air conditioning systems.
- Maximise opportunities to enhance biodiversity on-site, including through appropriate landscaping, Sustainable Drainage Systems, living roofs and green walls.
- Wherever possible, use building materials with high environmental performance ratings.
- Seek opportunities for locally sourced labour.

DM22 Decentralised Energy

- Decentralised Energy is supported by both national and regional policy as a means of meeting requirements of the Climate Change Act on carbon emission reduction. The London Plan includes a target for 25% of heat and power used in London to be generated using localised DE systems by 2025.
- Subject to other policy requirements, proposals that contribute to the provision and use of Decentralised Energy network infrastructure will be supported.

Communal energy systems

1. All development that incorporates site-wide communal energy systems should examine opportunities for extending such systems, irrespective of whether it is connected to a DE network.
2. All development that incorporates site-wide communal energy systems should optimise opportunities for extending such systems beyond the site boundary to supply energy to neighbouring existing and planned future developments.

Existing and planned future DE networks

1. All development proposals should prioritise connection to existing or planned future DE networks.
2. All major development located within 500 metres of an existing DE Network, and minor new-build development located within 25 metres, will be expected to secure connection to that network subject to demonstration of technical feasibility and financial viability.
3. All major development located within 500 metres of a planned future DE Network, which is considered by the Council likely to be operational within 3 years of a grant of planning permission, will be expected to secure connection to that network subject to demonstration of technical feasibility and financial viability.

DE network 'connection zones'

1. All major development located within 500 metres of a DE network 'connection zone' should be designed for connection to a DE network.
2. All minor new-build development located within 25 metres of a DE network 'connection zone' should be designed for connection to a DE network.

Customer charters

1. Where site-wide communal and district heating systems are operational, the Council will strongly encourage heat and energy service providers to enter into customer charters with domestic and micro-business customers.

This hierarchy has been used in parallel with the requirements of current Building Regulations for the conservation of fuel and power (Part L2: 2021), which sets out a specific benchmark of performance for the basic building design.

Once this benchmark has been reached the hierarchy is adopted. The structure of this report follows the ordered approach of the hierarchy, discussing compliance with Building Regulations and using less energy, supplying energy efficiently, effective renewable energy solution, and finally proposing carbon offset to achieve Zero Carbon target.

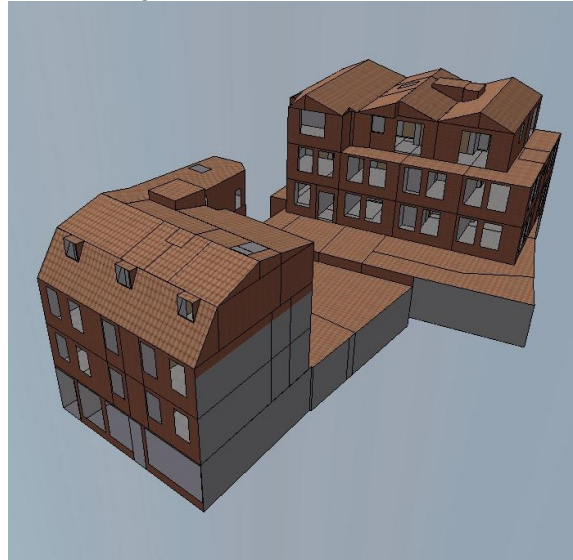
2.4 Building characteristics

The proposed development has the following key characteristics:

- Gross floor area of 1,292.6m² split across 4 floors. The ground floor consists of a flexible commercial, business and services use (Class E) unit and amenity spaces, the upper floors consist of purpose-built student accommodations (Sui Generis).
Note: GIA of calculated areas is measured from the modelled building at the time and may differ slightly from the above area. This will not materially affect the results shown.
- The main front space facing High Road on the ground floor is proposed as flexible commercial, business and services use (Class E) unit and entrance of Block A. The rear of the building consists of the amenity spaces, hostel entrance for Block B, bin store and cycle stores.

- The upper floors will be consisting of single bed (with bathroom or shower rooms) student accommodation, a shared common room, and stairs/lifts. The student accommodation is split into two blocks, Block A – above the retail space facing High Road, and Block B at rear, entrance via Percival court.
- Plantroom is located on ground floor at rear of the building under Block B, and each floor will have the local air handling units for ventilation.

Figure 2 – Building thermal model image



2.5 Proposed services strategy

All the bedrooms will be heated and comfort cooled by VRF systems feeding in to the room via 4 pipe local fan coil units, the rooftop VRF condensers are connected to Hydroboxes which provide heating and chilled water to the fan coil units. The hydrobox circuits for heating/cooling incorporate buffer vessels in line with London Plan SI2 and has the capability to connect to a future district heat network, when available.

At ground, a new retail unit will be created and left as a shell for future fit-out.

Heating to all common parts will be via low profile electric heaters and with electric towel rails in shower rooms.

The building will be mechanically ventilated with the fresh air being provided via local air handling units, which will feed ducted ventilation systems. A dedicated extract system will serve the ground floor back-of-house amenity spaces and bin stores.

3.0 PART L 2021

The energy performance of the building is calculated using the approved IES VE 2023 (Version 7.0.23). This software models the carbon dioxide emission rates produced by a building in accordance with Part L2 of the Building Regulations (2021). The software is approved for use by the Department for Communities and Local Government (DGLG) as a Dynamic Building Simulation Modelling Package (DSM).

The building will be assessed under Part L2 2021 and as such, it is a requirement that the building meet the minimum building regulations in terms of the maximum façade U-Values, minimum values for energy efficiencies and minimum values for CO₂ reductions; figure 3 below details the minimum Part L2 requirements for the building construction elements used by a notional building (**Source: AD Part L2 2021**).

Table 4.1 Limiting U-values for new or replacement elements in new and existing buildings and air permeability in new buildings	
Element type	Maximum U-value ⁽¹⁾ W/(m ² ·K) or air permeability
Roof (flat roof) ⁽²⁾	0.18
Roof (pitched roof) ⁽²⁾	0.16
Wall ⁽²⁾⁽³⁾	0.26
Floor ⁽⁴⁾⁽⁵⁾	0.18
Swimming pool basin ⁽⁶⁾	0.25
Windows in buildings similar to dwellings ⁽⁷⁾⁽⁸⁾	1.6 or Window Energy Rating ⁽⁹⁾ Band B
All other windows, ⁽⁸⁾⁽¹⁰⁾⁽¹¹⁾ roof windows, curtain walling	1.6
Rooflights ⁽¹²⁾⁽¹³⁾	2.2
Pedestrian doors (including glazed doors) ⁽¹⁴⁾	1.6
Vehicle access and similar large doors	1.3
High-usage entrance doors	3.0
Roof ventilators (including smoke vents)	3.0
Air permeability (for new buildings)	8.0m ³ /(h·m ²) @ 50Pa

Figure 3: Part L2 Maximum Construction U-values.

3.1 Target Building Model (TER)

The target building represents the 'baseline' building for the proposed development which just meets the minimum standards of CO₂ emissions reduction (i.e. the Building Emissions Rate (BER) is equal to the Target Emissions Rate (TER), as defined by Part L of the Building Regulations 2021).

Allowances for energy consumption not included under Part L have been made by reference to published material or by calculation. These include small power (energy use for electrical appliances). The energy breakdown and carbon dioxide emissions by end user as part of the study for the occupancy areas of the building, a thermal model of the building was developed and analysed using the approved IES Virtual Environment Software (Version 7.0.23).

Unregulated energy use and the associated carbon dioxide emissions for the buildings has been calculated using the BRUKL document and CIBSE publications for guidance, as well as evidence established through previous development work.

Table 5 below outlines the target building 2021 Emission rates:

	Total Emission (kgCO ₂ / annum)	Total Emission (kgCO ₂ / annum/m ²)
Building Regulations 2021, Part L Compliant Development (DEN)	53,654	43.72
Building Regulations 2021, Part L Compliant Development (ASHP)	7,816	11.86

3.2 Cooling and overheating

The overheating risk has been mitigated through passive measures by applying cooling hierarchy Policy SI 4 Managing heat risk of the London Plan 2021, cooling hierarchy has been applied to the proposed scheme.

- Reducing the amount of solar gain – The building will have internal blinds, and high-performance solar control glazing.
- Minimising Internal gains – The internal gains are minimised with energy efficient lighting design and insulating the services to reduce the heat gains.
- Passive ventilation - Noise levels and air quality across the site means that mechanical ventilation will be required to control overheating. There may be the possibility to consider mixed mode strategies at user discretion by opening windows.
- Mechanical ventilation - A mechanical ventilation system is required to provide sufficient fresh air to the spaces. The mechanical ventilation will utilise free cooling when outside temperatures are lower.
- Providing active cooling – High efficiency heat recovery heat system will provide heating and cooling to the spaces.

Table 6 – Cooling demand comparison between actual and notional building

	Area weighted average cooling demand (MJ/m ²)	Total area weighted cooling demand (MJ/year)
Actual	31.7	38,905
Notional	44	54,001

The building passes the Part L 2021 Criterion 3 for overheating, see Figure 4 an extract from BRUKL document below (full report attached as an appendix);

Overheating analysis has been carried out for current and future weather files. Based on the results, the building has been shown not to need cooling to pass the overheating criteria today, it does not pass the using the weather files for 2050 and beyond. Therefore to future proof the building active cooling will be required to ensure the building is maintained at optimum temperature during peak summer.

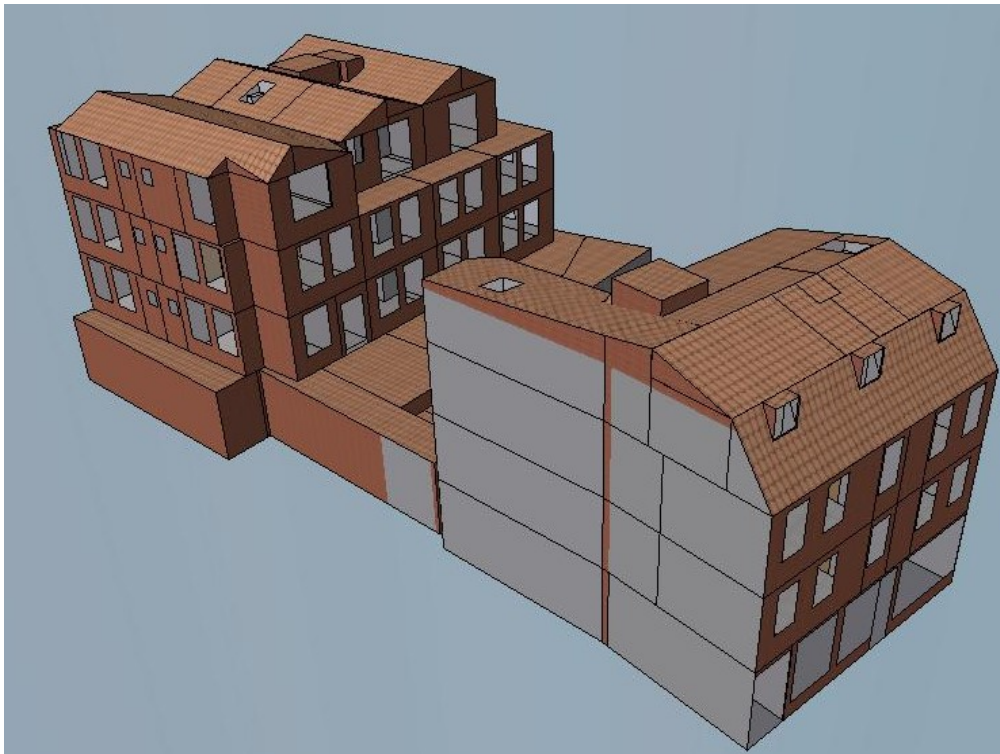
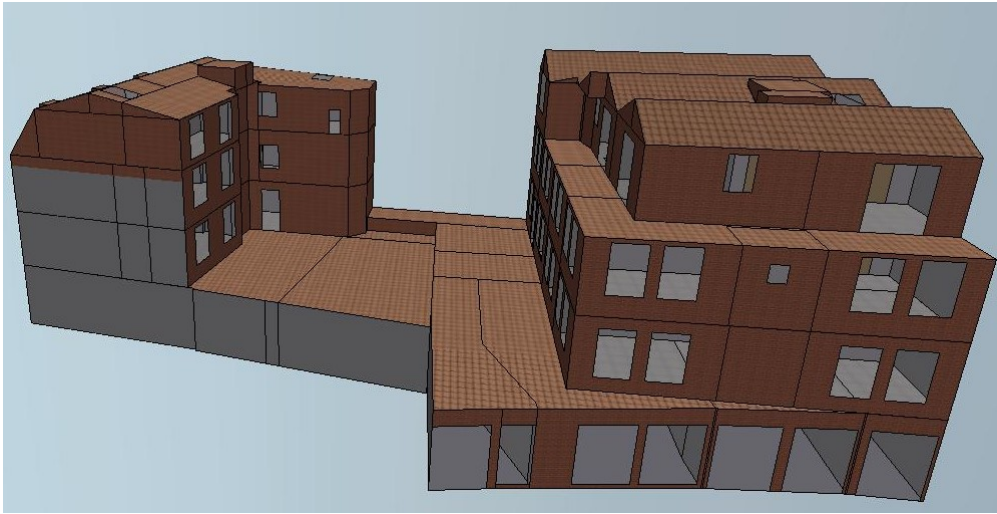
The building is to be heated via air source heat pumps, which can work in reverse to provide chilled water for cooling. This therefore means that this cooling can be provided very efficiently and with minimal additional plant by using the ASHPs and fan coil units in each student's room. Providing the cooling centrally in this manor will also allow the building to be setup to only activate the cooling when peak external temperatures require it.

Figure 4 – Criterion 3 – extract from the BRUKL document;

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block A-1F-S1 Studio	NO (-61.2%)	NO
Block A-1F-S1 Studio-Bathroom	N/A	N/A
Block A-1F-S2 Studio	NO (-50.7%)	NO
Block A-1F-S2 Studio-Bathroom	N/A	N/A
Block A-1F-S3 Studio	NO (-65.7%)	NO
Block A-1F-S3 Studio-Bathroom	NO (-34%)	NO
Block A-2F-S4 Studio	NO (-63.3%)	NO
Block A-2F-S4 Studio-Bathroom	N/A	N/A
Block A-2F-S5 Studio	NO (-61.1%)	NO
Block A-2F-S6 Studio	NO (-63.4%)	NO
Block A-2F-S6 Studio-Bathroom	NO (-29%)	NO
Block A-2F-Studio-Bathroom	N/A	N/A
Block A-3F-R1 Bedroom	NO (-86.6%)	NO
Block A-3F-R1-Bathroom	N/A	N/A
Block A-3F-R2 Bedroom	NO (-88.2%)	NO
Block A-3F-R2-Bathroom	NO (-51.4%)	NO
Block B-1F-S7 Studio	NO (-56.4%)	NO
Block B-1F-S7 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S8 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S9 Studio	NO (-40%)	NO
Block B-1F-S9 Studio-Bathroom	N/A	N/A
Block B-1F-S10 Studio	NO (-39.3%)	NO
Block B-1F-S10 Studio-Bathroom	N/A	N/A
Block B-1F-S11 Studio	NO (-53%)	NO
Block B-1F-S11 Studio-Bathroom	N/A	N/A
Block B-1F-S12 Studio	NO (-64.3%)	NO
Block B-1F-S12 Studio-Bathroom	N/A	N/A
Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block B-2F-S13 Studio	NO (-50.1%)	NO
Block B-2F-S13 Studio Bathroom	NO (-84.3%)	NO
Block B-2F-S14 Studio	NO (-75.6%)	NO
Block B-2F-S14 Studio-Bathroom	NO (-84.9%)	NO
Block B-2F-S15 Studio	NO (-40%)	NO
Block B-2F-S15 Studio -Bathroom	N/A	N/A
Block B-2F-S16 Studio	NO (-39.2%)	NO
Block B-2F-S16 Studio-Bathroom	N/A	N/A
Block B-2F-S17 Studio	NO (-52.8%)	NO
Block B-2F-S17 Studio-Bathroom	NO (-94.5%)	NO
Block B-2F-S18 Studio	NO (-83.3%)	NO
Block B-2F-S18 Studio-Bathroom	N/A	N/A
Block B-3F-S19 Studio	NO (-69.9%)	NO
Block B-3F-S19 Studio-Bathroom	NO (-92%)	NO
Block B-3F-S20 Studio	NO (-73.8%)	NO
Block B-3F-S20 Studio-Bathroom	NO (-84.3%)	NO
Block B-3F-S21 Studio	NO (-46.2%)	NO
Block B-3F-S21 Studio-Bathroom	N/A	N/A
Block B-3F-S22 Studio	NO (-70.8%)	NO
Block B-3F-S22 Studio-Bathroom	N/A	N/A
Block B-3F-S23 Studio	NO (-79.8%)	NO
Block B-3F-S23 Studio-Bathroom	N/A	N/A
Block B-GF-WC-Shower	N/A	N/A
Block B-S1F-8 Studio	NO (-36.5%)	NO
Block A-GF-Plant Space	N/A	N/A
Block A-GF-Retail-Retail Unit	NO (-5.8%)	NO

Figures 5 & 6– Building thermal model image – South elevation (5) & East elevation (6)



4.0 THE ENERGY HIERARCHY – Compliance with building regulations

The first stage of the hierarchy uses compliance with L2 of the 2021 Building Regulations as a benchmark for the 'worst performing' but legally permissible development. According to Building Regulations Part L the approach to showing compliance is that the annual CO₂ emission rate of the completed building must not exceed the target set by reference to a notional building.

4.1 ENERGY HIERARCHY Step 1- Using less energy

Complying with the first stage of the energy hierarchy can be achieved by implementing 'passive' energy efficiency measures to reduce the demand for energy.

This development will benefit from: -

- The provision of high thermal performance by means of increased insulation and double or triple-glazed window systems to reduce heat loss.
- Air-tight construction techniques to minimise unwanted air infiltration, certified air-tight windows and post completion air-pressure testing to ensure compliance with design standards.
- Reducing summertime overheating by providing windows with lower g-value and solar shading devices.
- Heat recovery ventilation systems.
- A-rated appliances.
- Water saving measures such as spray taps.
- Low energy light fittings.
- Presence detection, and daylight dimming within common/core spaces which have access to daylight.

4.1.1 Lighting Densities & Fabric U-values

Tables 6 & 7 summarises the proposed lighting densities and controls, and construction related measures affecting the thermal performance of the building.

Table 6: Lighting densities and controls for the proposed building

System	Parameter	Applied Values for the proposed development
Lighting Efficiency	Bedroom	2.5 W/m ² per 100 Lux
	Transient areas	3.5 W/m ² per 100 Lux
Lighting Controls	Bedroom	Manual On-off and daylight dimming
	Transient areas	Auto On-off

Table 7: Thermal performance for the proposed building in comparison with the base case building

U-values (W/m ² K)	Current building regulations minimum*	Values for the proposed extension
Walls	0.26	0.14
Floors	0.18	0.11
Roofs	0.16	0.11
Opaque door	1.6	1.6
Windows and glazed doors	1.6	1.0 (G-value 0.3)
Air permeability	8m ³ /m ² h at 50 Pa	3m ³ /m ² h at 50 Pa

*=Simplified area weighted averages, Part L2

4.1.2 Part L calculation summary

The Part L calculation summary for the non-domestic is given in table 8.

Table 8a: DEN - Part L output

	Energy consumption kWh/m ² /year		Carbon emission kgCO ₂ /m ² /year	
	Notional Building	Proposed building	Notional Building	Proposed building
Heating	37.64	27.19	8.66	0.41
Domestic hot water	144.28	149.05	33.18	2.24
Cooling	1.32	0.71	0.18	0.10
Auxiliary power	11.81	14.31	1.59	1.94
Lighting	8.62	12.47	1.16	1.69
Displaced electricity	-8.13	-3.78	-1.05	-0.49
Total	195.54	199.95	43.72	5.88

The notional building emission rate (TER) is 43.72 and the BER is 6.37(kgCO₂/m².annum).
This represents an 85% carbon reduction over the Target Emissions Rate (TER).

Table 8a: ASHP - Part L output

	Energy consumption kWh/m ² /year		Carbon emission kgCO ₂ /m ² /year	
	Notional Building	Proposed building	Notional Building	Proposed building
Heating	14.26	7.55	1.92	1.03
Domestic hot water	50.45	41.4	6.94	5.66
Cooling	1.32	0.71	0.18	0.10
Auxiliary power	11.81	14.59	1.63	2.00
Lighting	8.62	12.47	1.19	1.71
Displaced electricity	0	-3.78	0.00	-0.49
Total	86.46	72.94	11.86	10.01

The notional building emission rate (TER) is 11.86 and the BER is 10.50(kgCO₂/m².annum).
This represents an 11% carbon reduction over the Target Emissions Rate (TER).

4.2 ENERGY HIERARCHY Step 2: Supplying energy efficiently.

Combined heat and power (CHP) has been considered for the development.

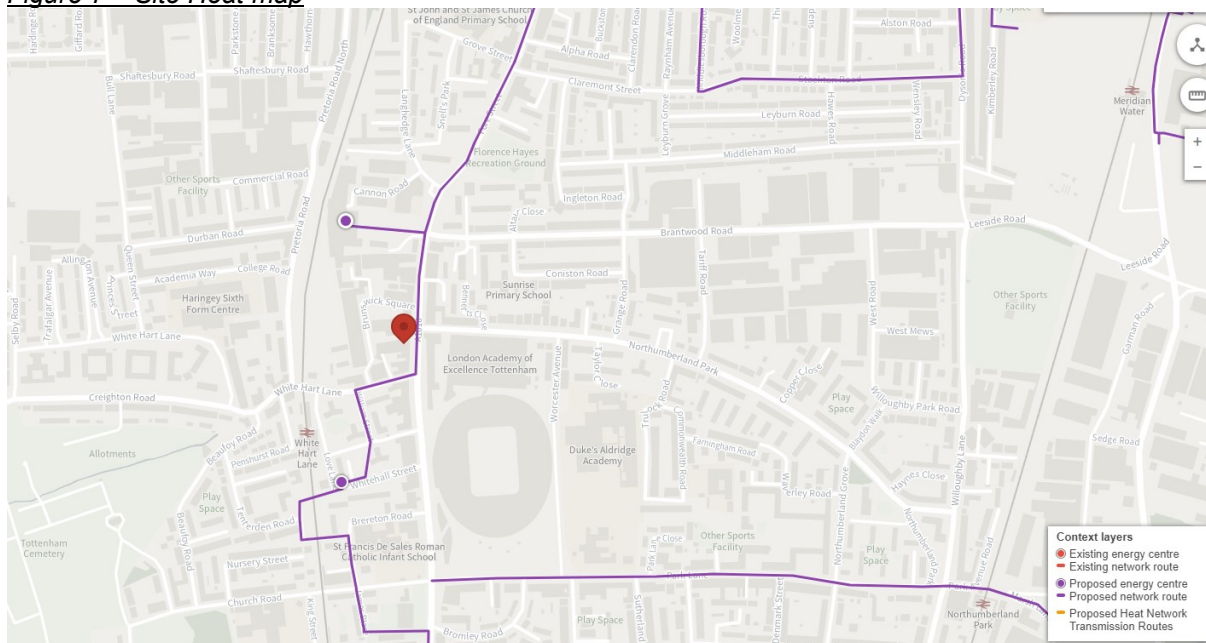
The economic viability of the CHP is heavily dependent on the consistent demand for heat and electricity. The building will have considerable heat demand during winter but sporadic heat demand during summer for domestic hot water, this will leave CHP sitting idle during summer which will make the system inefficient as a whole.

CHP has been discounted for the site due to the lack of consistent and synchronous base thermal and electrical loads which would mean the CHP engine being idle for most time.

It can be established from the heat map below the proposed site is not close to any existing District heating transmission line (shown in red) but close to the potential future district heating transmission line (shown in purple).

The works are in progress in relation to new Meridian Water Energy Centre and construction of main distribution networks. **The energy centre, located at the Ecopark North East of the development, is understood to generate Heat from Waste and will be operational in 2026. The carbon factor for this energy generation is 0.014 at source, and 0.015 at development connection.** (As this a new DEN, the notional building uses a standard carbon factor of 0.23KgCO₂/kWh). Prior to its completion, the DEN distribution will utilise its heat from alternative sources, which will subsequently become energy sources to manage with peak lopping of high demand periods to the network. Given the proximity, the heating system within this development will be designed with the capability to connect to this district heating system in the future when available.

Figure 7 – Site Heat map



If the building is connected to the proposed heat network, the building's annual carbon emission will be 8.12 tonnes, refer to Brukl document in the appendix.

No Fossil Fuel Energy Strategy

The electrical grid in the UK has been decarbonising and is projected to continue doing so. The carbon intensity of electricity has reduced from 0.519 kgCO₂/kWh to 0.136 kgCO₂/kWh. This means using grid electricity becomes a lower carbon source of energy than gas. This favours electrically powered heat pumps for heating and cooling, and means that CHP is no longer beneficial in carbon terms.

The proposed development has all heating and cooling by electrically powered heat pumps. This aligns with the Net Zero Carbon pathway.

4.3 ENERGY HIERARCHY Step 3: Using renewable energy.

Having established the improved emission rate through the means detailed in steps 1 and 2, further savings may be made through the integration of renewable technologies.

Each of the available technologies as set out in the London plan have been considered. The one technology that lends itself to the development, in terms of building usage, location and practicality is solar photovoltaic. The other available technologies have been ruled out for reasons of suitability as described below;

4.3.1 Photovoltaics

Photovoltaics (PV) panels convert solar energy into electricity. They must be in a generally southern facing orientation at ideally, 30° to the horizontal.

The proposed development's model has shown a steady regulated energy demand along with potentially high unregulated electricity demand. PV's will be a suitable Zero carbon technology to assist with the achievement of the target emission reduction of 35% as outlined by the LBH local plan. PV panels should be mounted at an elevation of around 30 degrees and orientated to the South for optimum output. We anticipate that approximately 43m² of monocrystalline PV panel area can be mounted on the roof, which generate 4.320kWh of electricity per year. This represents 4.1% of carbon saving from onsite generation.

Any changes to the final design of the PV system, panel efficiency or available area should be reviewed and re-calculated to achieve the minimum electricity generation.

4.3.2 Solar Hot Water

Solar thermal panels use free heat from the sun to warm the domestic hot water. They must be located in a generally south facing position, ideally at about 30° to the horizontal.

The scheme investigated is based on installing a nominal active area of high efficiency (evacuated tube) solar hot water panels, accommodated on the roof of the building. Such systems are relatively low maintenance, are a proven technology and are a visible indication of the development's green aspirations.

Although efficient and cost effective in implementation, solar hot water systems can only offset a fraction of the domestic hot water demand for the site, which is quite small compared to other energy demands. Solar hot water panels are therefore not recommended for this development.

4.3.3 Biomass

We have excluded Biomass from this study, as the system emits high particulate matter (PM) and nitrogen oxide (NOx) emissions and the potential nitrous oxide (N₂O) biomass and biofuel installations may not meet the air quality requirements.

Note: We have excluded CHP or CCHP running on biofuel from this study, due to the high particulate matter (PM) and nitrogen oxide (NOx) emissions and the potential nitrous oxide (N₂O) biomass and biofuel installations may not meet the air quality requirements.

4.3.4 Ground source heating

Ground source heating extracts heat from the ground, the carbon benefit being that considerably more heat energy is extracted than electrical energy is used to run the system. Whilst the generation of 1kW of electricity produces 2.6 times more CO₂ than the burning of 1kW of gas, ground source systems can expect to produce at least 3 times more heat energy than the electrical energy put into them (known as the Coefficient of Performance or COP) and therefore produce less CO₂ than the equivalent gas boiler. The system requires a connection to the general mass of the ground, either using an array of horizontal pipes buried in an open area (for example a field) or an array of vertical pipes contained within deep (perhaps 100M) boreholes. It is sometimes possible to utilise the ground piles of a building as vertical boreholes. A horizontal system requires a substantial area of land to collect heat – perhaps 90M² / kW. The bores for a vertical system should be placed at least 5M apart, and a 100M borehole might produce 3kW.

The site is located in the urban area with limited footprint and no large open ground, and the limited footprint of the building suggests that there will not be sufficient area for either the horizontal or the vertical system. Hence this technology will not be pursued.

4.3.5 Wind Turbines

Wind turbines produce electricity directly from the energy in wind. This is then fed into the buildings electrical system via a control gear. Two types of wind turbine are available; horizontal axis and vertical axis. The former tends to be noisy and produce vibration. The latter are quieter in operation and more suited to installation on buildings but are generally less efficient and more expensive.

Wind turbines can be quite large and impact the visual appeal of landscapes, and the blades may cause unacceptable noise levels. Given such impacts, it is considered that wind turbines would not be appropriate at this location.

4.3.6 Conclusion to consideration Low & Zero Carbon Technologies

After considering the different LZO technologies, it has been concluded that the building would benefit the most from the utilisation of a PV system to achieve the required carbon reduction target. This system is hence incorporated within the actual building and form part of the energy strategy.

As a result, for the DEN scenario the notional building emission rate (TER) is 43.72 and the BER is reduced to 5.88.

This represents a 1.1% carbon reduction over the Target Emissions Rate.

Likewise, for the ASHP scenario the notional building emission rate (TER) is 11.86 and the BER is reduced to 10.01.

This represents a 4.1% carbon reduction over the Target Emissions Rate.

4.4 ENERGY HIERARCHY Step 4: Energy monitoring

The buildings will have smart metering installed to measure heat, electricity, and water usage. Each floor will have their own individual heating, ventilation, and cooling controls. These controls should allow for zoning within the bedrooms with timers.

The building should have optimum start/stop, weather compensation, out of range energy monitoring, and local temperature and time control linked to central control system.

Extensive metering of all electrical, heating, ventilation and cooling energy use will give the building management a clear understanding of the energy usage within the building. This should provide scope for any improvement in the system setup/start time to reduce the building's overall energy consumption.

The buildings will incorporate building network set-up with intelligent systems. All major plants and the systems will be monitored to enable a minimum of 90% of the energy used in the building is attributed to an end use. The provision of meters to allow separate metering of lighting and small power on each floor, to comply with Building Regulations Part L.

Actual or Green Building

The final Actual building which is lean building measures as outlined above along with renewable (LZO) technologies identified as above applied to achieve the required building emission targets. A summary of the energy consumption and CO₂ emissions rate for the actual building can be seen in table 8 below:

Table 9a: DEN - Regulated Carbon Dioxide Emissions Break Down of Actual Building

System	Energy Consumption (kWh/yr)	CO ₂ Emission (kg/yr)	CO ₂ Emission (kg/yr/m ²)
Heating	33,370	501	0.41
Domestic hot water	182,929	2,744	2.24
Cooling	871	118	0.10
Auxiliary power	17,563	2,380	1.94
Lighting	15,304	2,074	1.69
Displaced electricity	-4,639	-598	-0.49
Total	245,398	7,218	5.88

The Actual BER is 5.88 kgCO₂/m²/yr as BRUKL report.

Table 9b: ASHP - Regulated Carbon Dioxide Emissions Break Down of Actual Building

System	Energy Consumption (kWh/yr)	CO ₂ Emission (kg/yr)	CO ₂ Emission (kg/yr/m ²)
Heating	9266	1268	1.03
Domestic hot water	50810	6951	5.66
Cooling	871	119	0.10
Auxiliary power	17906	2450	2.00
Lighting	15304	2094	1.71
Displaced electricity	-4639	-598	-0.49
Total	89519.262	12282.88	10.01

The Actual BER is 10.01 kgCO₂/m²/yr as BRUKL report.

Table 10a: DEN - Carbon dioxide reduction summary:

	Carbon dioxide emissions for non-domestic buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulation Compliant Development	53.6	5.1
After energy demand reduction & Heat network	7.82	5.1
After Renewables	7.22	5.1

Table 10b: ASHP - Carbon dioxide reduction summary:

	Carbon dioxide emissions for non-domestic buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulation Compliant Development	14.6	5.1
After energy demand reduction	12.9	5.1
After Renewables	12.28	5.1

Table 11a: DEN - Carbon dioxide savings:

	Regulated non-domestic Carbon Dioxide Savings	
	Tonnes CO ₂ per annum	Percentage
Savings from energy demand reduction	0.6	1.1%
Savings from heat network/CHP	45.2	84.3%
Saving from renewable energy	0.6	1.1%
Total Cumulative Savings	46.38	86.5%

Table 11b: ASHP - Carbon dioxide savings:

	Regulated non-domestic Carbon Dioxide Savings	
	Tonnes CO ₂ per annum	Percentage
Savings from energy demand reduction	1.67	11.5%
Savings from heat network/CHP	1.3	n/a
Saving from renewable energy	0.6	4.1%
Total Cumulative Savings	2.27	15.6%

Table 12: Carbon off-set

Resulting Carbon off-set Payment	Total
30 years Cash in Lieu contribution (£95/ tonne CO ₂) – District Heating	£20,577
30 years Cash in Lieu contribution (£95/ tonne CO ₂) – Heat Pump	£34,998
Deferred Carbon Offsetting Contribution (+indexation) payment due if not connecting to the DEN	£34,998 - £20,577 = £14,421

The London Borough of Haringey local policy requires a 35% saving on site target. The shortfall in the CO2 on site savings can be delivered via a carbon offset cash-in-lieu contribution payment into the offset fund administered by LBH or through the purchase of verified emission reductions from carbon offset projects.

Figure 8a – DEN - Total site carbon savings

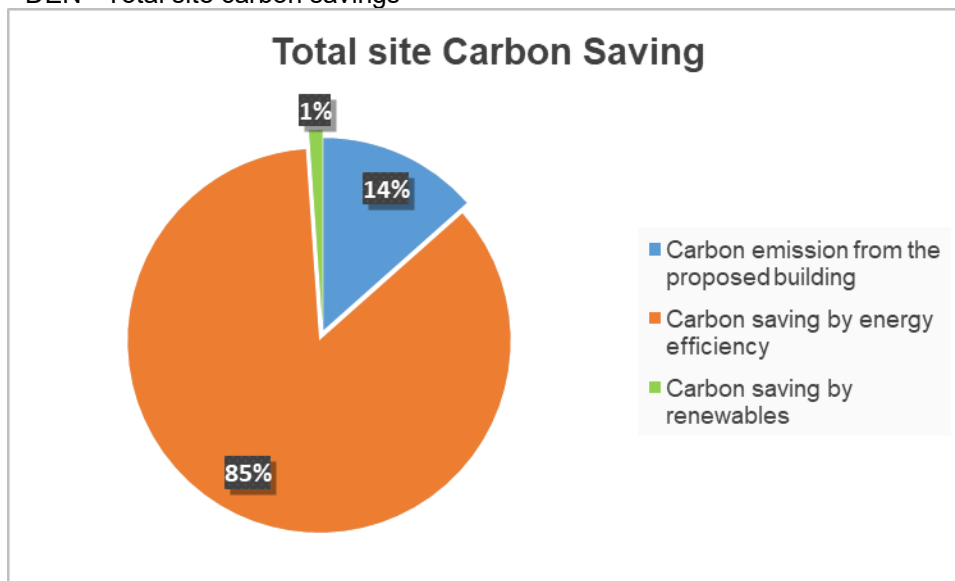
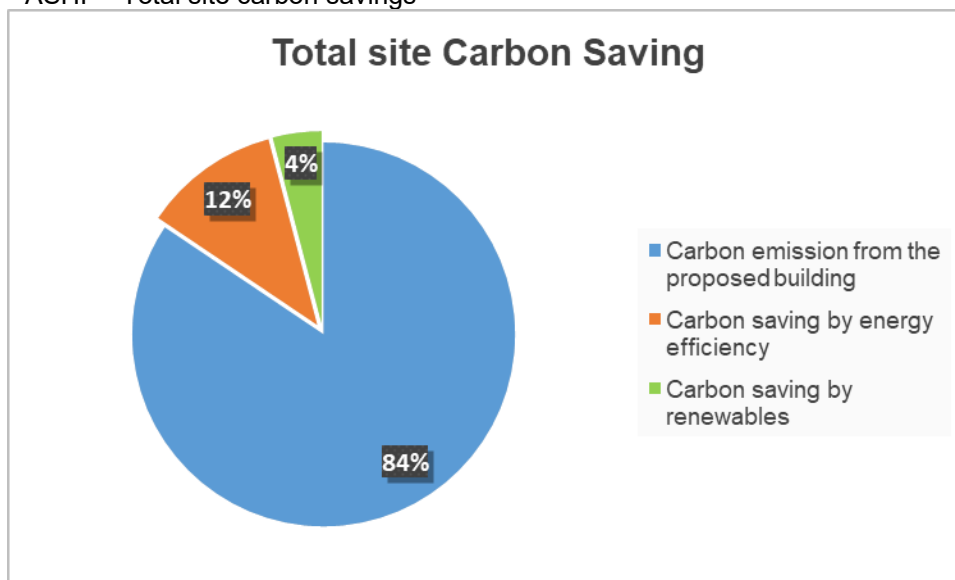


Figure 8b – ASHP - Total site carbon savings



5.0 SUSTAINABLE DESIGN & CONSTRUCTION

The sustainable assessment criteria as developed by BRE are utilised within this report to confirm that the development meets with the requirements of the London Borough of Haringey's sustainability policies.

For the proposed development, particular attention has been paid to the following issues:-

5.1 Energy efficiency; vacant & underused land and buildings

For matters of Passive Design, Solar gain control & daylighting, Ventilation, Thermal Performance, Services Strategy, Low or zero carbon technologies and overall Energy Performance, all these matters have been dealt within the London Plan compliant Energy Statement within the previous Sections.

5.2 Materials

The design team have put a strong focus on sustainability and durability when considering construction profiles and building materials for the development. High Green Guide ratings will be achieved wherever possible and materials will be assessed for suitability with regards to Whole Life Costs.

Insulating materials will be specified to maximise thermal performance whilst still paying attention to the environmental impact of the materials used. The use of recycled products will be pursued wherever feasible and the use of other low embodied energy products will be further investigated. Responsible sourcing will also be pursued. All timber used on site during the construction phase and within the building will be from FSC sources or equivalent. Other materials, including insulation, will be sourced from manufacturers who employ environmental management systems such as ISO 14001 or BES 6001. Where possible, materials will be sourced locally.

Non-toxic materials will be used wherever possible, including the specification of products with low VOC content in line with European testing standards.

A Site Waste Management Plan (SWMP) will be produced for the site, which will determine how to maximise the recovery of materials from the enabling works for subsequent high-grade/value applications.

5.3 Pollution

5.3.1 Policy SI 1 Improving air quality

Plant and machinery

All plant and equipment installed in the building will be appropriately sized and selected for efficiency in order to reduce greenhouse gas emissions. All equipment will be frequently maintained to ensure it continues to run efficiently and cleanly.

Operational impacts

The use of VRF heat pump technology for all heating systems will maximise the achievable Coefficient of performance available for this building and minimises the projects impact on the local air quality.

This is inline with Policy SI 1, the proposed development will be air quality neutral.

5.3.2 Noise pollution

The development will comply with Building Regulations Part E, providing a good level of sound insulation between the proposed development and surrounding buildings. All new windows will be double or triple-glazed to minimise the transmission of noise between the building and adjacent properties.

External plant that could cause a noise nuisance will be suitably attenuated following the guidance from a suitably qualified acoustician.

5.3.3 Contaminated land

The proposed building use will not involve the storage, processing or transfer of hazardous substances.

5.4 Policy SI5 Water Infrastructure

Water use, both in terms of consumption and discharge has been minimised by the design of the development. The project team will work closely to develop water strategies which reduce potable water consumption and decrease risks of water pollution and flooding.

In terms of water use, it is proposed to utilise where possible:

- Operational low water use solutions such as low flush WCs with dual flush, low flow taps including wash hand basin taps and kitchen sink taps.
- Use of water efficient equipment to target 105 litres per person per day.
- Reduction of leakage through high quality installation and testing before completion.
- Water metering will be installed to allow accurate measurement, management and monitoring of water use by building users.

While the exact water usage and flow rates of fittings have yet to be fully developed, at this stage the fittings used are likely to be along the lines of the following to ensure it does not exceed a target of 105 litres per person per day:

- WCs – 6 litre / 4 litre flush
- Sink Taps – 3 litres / minute
- Kitchen Taps – 5 litres / minute
- Showers – 9 litres / minute
- Baths – 130 litre capacity
- Dishwashers – 8 litres / kg

All white goods provided will have maximum water efficiency ratings.

5.5 Light pollution

The development is in a highly urbanised location, and therefore will not significantly contribute to increasing the effects of light pollution.

The design team will follow the appropriate ILE design guidance with a view to achieving compliance.

5.6 Policy SI7 Reducing waste and supporting the circular economy.

The recycling of operational waste once the building is occupied will be encouraged through the provision of recycling facilities and dedicated internal and external storage for recyclable materials, separate to those for domestic refuse.

5.7 Amenity, environmental quality, daylight and sunlight

The impact on sunlight and daylight to the surrounding buildings is expected to be minimal and is subject to a separate report.

There are limited opportunities to incorporate landscaping and habitat creation into the development, which is on a constrained site in a highly urbanised location.

The project will be required to be formally assessed against the BRE's environmental assessment method (BREEAM) and achieve a minimum rating of BREEAM "Very Good" with a target of "Excellent".

A pre-assessment tracker document is included separately within the planning submission, which gives further detail on the above issues and others associated with the BREEAM assessment process.

6.0 CONCLUSION

An energy hierarchy has been simulated to show the steps in building design improvement and their effects on the overall building performance.

This report has detailed the baseline energy requirements for the proposed development, the reduction in energy demand as a result of energy efficiency measures and the potential to achieve further CO₂ reductions using renewable energy technologies.

Below are the salient points of the core improvement over Part L2 standards applied to the Actual Building or the proposed building:

- The values for the thermal performance of the building elements are to better the minimum requirements of Part L2 as discussed in this report.
- The control strategy for the lighting within the occupied spaces should include presence detection and daylight dimming and switching.
- The values for lighting densities should be equal or better than the values stated in table 5 of this report.
- The values for the efficiencies of the mechanical plant serving the building should be equal or better than the notional standard values.

Energy and Carbon savings for the two scenarios have been shown as:

	Regulated non-domestic Carbon Dioxide Savings	
	Tonnes CO ₂ per annum	Percentage
DEN total Cumulative Savings	46.38	86.5%
ASHP total Cumulative Savings	2.27	15.6%

- The proposed construction will emit less CO₂ than the minimum requirement building due to passive design features, such as the provision of high levels of thermal insulation and air-tightness and energy efficient systems.
- Additional savings in emissions will also be saved through the use of solar Photovoltaic panels.
- The above represents a total carbon reduction of 86.5% for the DEN or 15.6% for the ASHP over the Part L2 2021 baseline.

The cover note to the GLA's Energy Assessment Guidance (June 2022 update) does acknowledge that non-residential developments may find it more challenging to achieve significant onsite carbon reductions beyond Part L 2021 to meet both the energy efficiency target and the minimum 35 per cent improvement. In such cases, development should demonstrate alignment to the energy hierarchy to minimise emissions as far as possible before offsetting. In the instances where it is not possible to achieve the requirements of Policy SI2, full compliance is achieved with the more recent Energy Assessment Guidance.

- All the residual regulated carbon emissions will be offset via a cash in lieu payments. The carbon emissions reduction achieved are maximum feasible with onsite measures considering the existing nature, acoustic and air quality requirements, and location of the site.

Resulting Carbon off-set Payment	Total
30 years Cash in Lieu contribution (£95/ tonne CO ₂) – District Heating	£20,577
30 years Cash in Lieu contribution (£95/ tonne CO ₂) – Heat Pump	£34,998
Deferred Carbon Offsetting Contribution (+indexation) payment due if not connecting to the DEN	£14,421

Appendix A – BRUKL Output Document

1. 807 High Road BRUKL DEN - Lean & Clean
2. 807 High Road BRUKL DEN - Lean, Clean & Green
3. 807 High Road BRUKL ASHP - Lean & Clean
4. 807 High Road BRUKL ASHP - Lean, Clean & Green

Project name

807 High Road

As designed

Date: Fri Jan 26 16:03:33 2024

Administrative information

Building Details

Address: 807 High Road, London, N17 8ER

Certifier details

Name: P3r Engineers

Telephone number: 02074907848

Address: 70 Cowcross Street, London, EC1M 6EJ

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.23

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

Foundation area [m²]: 298.83The CO₂ emission and primary energy rates of the building must not exceed the targets

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

Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	43.72
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	6.39
Target primary energy rate (TPER), kWh _{PE} /m ² .annum	211.07
Building primary energy rate (BPER), kWh _{PE} /m ² .annum	319.4
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER > TPER

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

Fabric element	U _{a-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.14	0.2	3F00001B_W15_A0
Floors	0.18	0.12	0.2	2F000009_F_A0
Pitched roofs	0.16	0.11	0.11	3F000007_C
Flat roofs	0.18	0.15	0.2	2F000009_C_A2
Windows** and roof windows	1.6	1.04	1.04	1F00001A_W3_O0
Rooflights***	2.2	1.13	1.13	3F000007_C_O0
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U_{a-Limit} = Limiting area-weighted average U-values [W/(m²K)]U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]

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

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Heat pumps

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	4.8	-	1.4	0.84
Standard value	N/A	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.001
Standard value	N/A	N/A

1- District heating network

	Emission factor [kgCO ₂ /kWh]	Primary energy factor [kWh _{pe} /kWh]
This building	0.015	1.58
Standard value	0.35	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

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

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
Block A-1F-S1 Studio		-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-1F-S1 Studio-Bathroom		-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-1F-S2 Studio		-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-1F-S2 Studio-Bathroom		-	-	-	-	-	-	-	0.2	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
Block A-1F-S3 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-1F-S3 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S4 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S4 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S5 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S8 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio -Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Block B-3F-S23 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S23 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-GF-WC-Shower	-	-	-	-	-	-	-	0.3	-	-	N/A
Block B-S1F-8 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-GF-Plant Space	0.3	-	-	-	-	-	-	-	-	-	N/A
Block B-GF-Plant Room	0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block A-1F-S1 Studio		95	-	-
Block A-1F-S1 Studio-Bathroom		126	-	-
Block A-1F-S2 Studio		89	-	-
Block A-1F-S2 Studio-Bathroom		133	-	-
Block A-1F-S3 Studio		88	-	-
Block A-1F-S3 Studio-Bathroom		135	-	-
Block A-2F-S4 Studio		95	-	-
Block A-2F-S4 Studio-Bathroom		126	-	-
Block A-2F-S5 Studio		89	-	-
Block A-2F-S6 Studio		88	-	-
Block A-2F-S6 Studio-Bathroom		136	-	-
Block A-2F-Studio-Bathroom		133	-	-
Block A-3F-R1 Bedroom		103	-	-
Block A-3F-R1-Bathroom		76	-	-
Block A-3F-R2 Bedroom		78	-	-
Block A-3F-R2-Bathroom		75	-	-
Block B-1F-S7 Studio		93	-	-
Block B-1F-S7 Studio-Bathroom		136	-	-
Block B-1F-S8 Studio-Bathroom		136	-	-
Block B-1F-S9 Studio		93	-	-
Block B-1F-S9 Studio-Bathroom		138	-	-
Block B-1F-S10 Studio		93	-	-
Block B-1F-S10 Studio-Bathroom		138	-	-
Block B-1F-S11 Studio		87	-	-
Block B-1F-S11 Studio-Bathroom		119	-	-
Block B-1F-S12 Studio		90	-	-
Block B-1F-S12 Studio-Bathroom		93	-	-
Block B-2F-S13 Studio		86	-	-
Block B-2F-S13 Studio Bathroom		142	-	-
Block B-2F-S14 Studio		86	-	-
Block B-2F-S14 Studio-Bathroom		138	-	-
Block B-2F-S15 Studio		93	-	-
Block B-2F-S15 Studio -Bathroom		96	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-2F-S16 Studio		93	-	-
Block B-2F-S16 Studio-Bathroom		138	-	-
Block B-2F-S17 Studio		88	-	-
Block B-2F-S17 Studio-Bathroom		116	-	-
Block B-2F-S18 Studio		85	-	-
Block B-2F-S18 Studio-Bathroom		145	-	-
Block B-3F-S19 Studio		88	-	-
Block B-3F-S19 Studio-Bathroom		90	-	-
Block B-3F-S20 Studio		85	-	-
Block B-3F-S20 Studio-Bathroom		133	-	-
Block B-3F-S21 Studio		92	-	-
Block B-3F-S21 Studio-Bathroom		138	-	-
Block B-3F-S22 Studio		94	-	-
Block B-3F-S22 Studio-Bathroom		138	-	-
Block B-3F-S23 Studio		90	-	-
Block B-3F-S23 Studio-Bathroom		136	-	-
Block B-GF-WC-Shower		92	-	-
Block B-S1F-8 Studio		69	-	-
Block A-2F-Core		52	-	-
Block A-2F-Corridor		65	-	-
Block A-2F-Lift		81	-	-
Block A-3F-Core		51	-	-
Block A-3F-Corridor		50	-	-
Block A-3F-Kitchen Cluster		152	-	-
Block A-3F-Lift		99	-	-
Block A-3F-Loft		46	-	-
Block A-B-GF-Circulation		62	-	-
Block A-GF-Core		50	-	-
Block A-GF-Entrance		68	-	-
Block A-GF-Lift		92	-	-
Block A-GF-Plant Space		108	-	-
Block A-GF-Retail-Retail Unit		77	15	10
Block A-GF-Retail-Retail Unit BOH		46	-	-
Block B-1F-Core		60	-	-
Block B-1F-Corridor		58	-	-
Block B-1F-Lift		78	-	-
Block B-2F-Core		74	-	-
Block B-2F-Corridor		58	-	-
Block B-2F-Lift		78	-	-
Block B-3F-Core		81	-	-
Block B-3F-Corridor		60	-	-
Block B-3F-Lift		74	-	-
Block B-3F-S23 CP		129	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-3F-Storage		130	-	-
Block B-GF-Bulk Storage		75	-	-
Block B-GF-Core		57	-	-
Block B-GF-Entrance		60	-	-
Block B-GF-Laundry		247	-	-
Block B-GF-Lift		88	-	-
Block B-GF-Lobby		70	-	-
Block B-GF-PBSA Amenity Space		78	-	-
Block B-GF-Retail Rear Access		58	-	-
Block B-1F-S7 Studio-CP		130	-	-
Block B-2F-S13 Studio-CP		129	-	-
Block B-2F-S14 Studio-CP		130	-	-
Block B-3F-S19 Studio-CP		130	-	-
Block B-3F-S20 Studio-CP		129	-	-
Block B-GF-Plant Room		99	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block A-1F-S1 Studio	NO (-61.2%)	NO
Block A-1F-S1 Studio-Bathroom	N/A	N/A
Block A-1F-S2 Studio	NO (-50.7%)	NO
Block A-1F-S2 Studio-Bathroom	N/A	N/A
Block A-1F-S3 Studio	NO (-65.7%)	NO
Block A-1F-S3 Studio-Bathroom	NO (-34%)	NO
Block A-2F-S4 Studio	NO (-63.3%)	NO
Block A-2F-S4 Studio-Bathroom	N/A	N/A
Block A-2F-S5 Studio	NO (-61.1%)	NO
Block A-2F-S6 Studio	NO (-63.4%)	NO
Block A-2F-S6 Studio-Bathroom	NO (-29%)	NO
Block A-2F-Studio-Bathroom	N/A	N/A
Block A-3F-R1 Bedroom	NO (-86.6%)	NO
Block A-3F-R1-Bathroom	N/A	N/A
Block A-3F-R2 Bedroom	NO (-88.2%)	NO
Block A-3F-R2-Bathroom	NO (-51.4%)	NO
Block B-1F-S7 Studio	NO (-56.4%)	NO
Block B-1F-S7 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S8 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S9 Studio	NO (-40%)	NO
Block B-1F-S9 Studio-Bathroom	N/A	N/A
Block B-1F-S10 Studio	NO (-39.3%)	NO
Block B-1F-S10 Studio-Bathroom	N/A	N/A
Block B-1F-S11 Studio	NO (-53%)	NO
Block B-1F-S11 Studio-Bathroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block B-1F-S12 Studio	NO (-64.3%)	NO
Block B-1F-S12 Studio-Bathroom	N/A	N/A
Block B-2F-S13 Studio	NO (-50.1%)	NO
Block B-2F-S13 Studio Bathroom	NO (-84.3%)	NO
Block B-2F-S14 Studio	NO (-75.6%)	NO
Block B-2F-S14 Studio-Bathroom	NO (-84.9%)	NO
Block B-2F-S15 Studio	NO (-40%)	NO
Block B-2F-S15 Studio -Bathroom	N/A	N/A
Block B-2F-S16 Studio	NO (-39.2%)	NO
Block B-2F-S16 Studio-Bathroom	N/A	N/A
Block B-2F-S17 Studio	NO (-52.8%)	NO
Block B-2F-S17 Studio-Bathroom	NO (-94.5%)	NO
Block B-2F-S18 Studio	NO (-83.3%)	NO
Block B-2F-S18 Studio-Bathroom	N/A	N/A
Block B-3F-S19 Studio	NO (-69.9%)	NO
Block B-3F-S19 Studio-Bathroom	NO (-92%)	NO
Block B-3F-S20 Studio	NO (-73.8%)	NO
Block B-3F-S20 Studio-Bathroom	NO (-84.3%)	NO
Block B-3F-S21 Studio	NO (-46.2%)	NO
Block B-3F-S21 Studio-Bathroom	N/A	N/A
Block B-3F-S22 Studio	NO (-70.8%)	NO
Block B-3F-S22 Studio-Bathroom	N/A	N/A
Block B-3F-S23 Studio	NO (-79.8%)	NO
Block B-3F-S23 Studio-Bathroom	N/A	N/A
Block B-GF-WC-Shower	N/A	N/A
Block B-S1F-8 Studio	NO (-36.5%)	NO
Block A-GF-Plant Space	N/A	N/A
Block A-GF-Retail-Retail Unit	NO (-5.8%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	1227.3	1227.3
External area [m ²]	2299.8	2299.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	466.43	737.57
Average U-value [W/m ² K]	0.2	0.32
Alpha value* [%]	40.35	25.85

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	27.19	37.64
Cooling	0.71	1.32
Auxiliary	14.59	11.81
Lighting	12.47	8.62
Hot water	149.05	144.28
Equipment*	30.64	30.64
TOTAL**	204.01	203.67

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

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	8.13
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>8.13</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	204.14	262.6
Primary energy [kWh _{PE} /m ²]	319.4	211.07
Total emissions [kg/m ²]	6.39	43.72

HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] District heating, [HFT] District Heating, [CFT] Electricity									
Actual	75.8	20.9	23.1	1.5	25.5	0.91	3.89	1	4.8
Notional	130.3	44	36.2	2.8	20.9	1	4.4	----	----
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity									
Actual	112.5	98.2	33.3	0	3.4	0.94	0	1	0
Notional	151	103.5	41.9	0	1.8	1	0	----	----
[ST] No Heating or Cooling									
Actual	17.3	1463.1	0	0	1.9	0	0	0	0
Notional	13.4	1474.2	0	0	2.6	0	0	----	----

Key to terms

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

Project name

807 High Road

As designed

Date: Fri Jan 26 16:10:15 2024

Administrative information

Building Details

Address: 807 High Road, London, N17 8ER

Certifier details

Name: P3r Engineers

Telephone number: 02074907848

Address: 70 Cowcross Street, London, EC1M 6EJ

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.23

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

Foundation area [m²]: 298.83The CO₂ emission and primary energy rates of the building must not exceed the targets

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

Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	43.72
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	5.91
Target primary energy rate (TPER), kWh _{PE} /m ² .annum	211.07
Building primary energy rate (BPER), kWh _{PE} /m ² .annum	313.83
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER > TPER

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

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.14	0.2	3F00001B_W15_A0
Floors	0.18	0.12	0.2	2F000009_F_A0
Pitched roofs	0.16	0.11	0.11	3F000007_C
Flat roofs	0.18	0.15	0.2	2F000009_C_A2
Windows** and roof windows	1.6	1.04	1.04	1F00001A_W3_O0
Rooflights***	2.2	1.13	1.13	3F000007_C_O0
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Heat pumps

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	4.8	-	1.4	0.84
Standard value	N/A	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.001
Standard value	N/A	N/A

1- District heating network

	Emission factor [kgCO ₂ /kWh]	Primary energy factor [kWh _{pe} /kWh]
This building	0.015	1.58
Standard value	0.35	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

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

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		Zone	Standard
Block A-1F-S1 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S1 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S2 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S2 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
Block A-1F-S3 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-1F-S3 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S4 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S4 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S5 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S8 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio -Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Block B-3F-S23 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S23 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-GF-WC-Shower	-	-	-	-	-	-	-	0.3	-	-	N/A
Block B-S1F-8 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-GF-Plant Space	0.3	-	-	-	-	-	-	-	-	-	N/A
Block B-GF-Plant Room	0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block A-1F-S1 Studio		95	-	-
Block A-1F-S1 Studio-Bathroom		126	-	-
Block A-1F-S2 Studio		89	-	-
Block A-1F-S2 Studio-Bathroom		133	-	-
Block A-1F-S3 Studio		88	-	-
Block A-1F-S3 Studio-Bathroom		135	-	-
Block A-2F-S4 Studio		95	-	-
Block A-2F-S4 Studio-Bathroom		126	-	-
Block A-2F-S5 Studio		89	-	-
Block A-2F-S6 Studio		88	-	-
Block A-2F-S6 Studio-Bathroom		136	-	-
Block A-2F-Studio-Bathroom		133	-	-
Block A-3F-R1 Bedroom		103	-	-
Block A-3F-R1-Bathroom		76	-	-
Block A-3F-R2 Bedroom		78	-	-
Block A-3F-R2-Bathroom		75	-	-
Block B-1F-S7 Studio		93	-	-
Block B-1F-S7 Studio-Bathroom		136	-	-
Block B-1F-S8 Studio-Bathroom		136	-	-
Block B-1F-S9 Studio		93	-	-
Block B-1F-S9 Studio-Bathroom		138	-	-
Block B-1F-S10 Studio		93	-	-
Block B-1F-S10 Studio-Bathroom		138	-	-
Block B-1F-S11 Studio		87	-	-
Block B-1F-S11 Studio-Bathroom		119	-	-
Block B-1F-S12 Studio		90	-	-
Block B-1F-S12 Studio-Bathroom		93	-	-
Block B-2F-S13 Studio		86	-	-
Block B-2F-S13 Studio Bathroom		142	-	-
Block B-2F-S14 Studio		86	-	-
Block B-2F-S14 Studio-Bathroom		138	-	-
Block B-2F-S15 Studio		93	-	-
Block B-2F-S15 Studio -Bathroom		96	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-2F-S16 Studio		93	-	-
Block B-2F-S16 Studio-Bathroom		138	-	-
Block B-2F-S17 Studio		88	-	-
Block B-2F-S17 Studio-Bathroom		116	-	-
Block B-2F-S18 Studio		85	-	-
Block B-2F-S18 Studio-Bathroom		145	-	-
Block B-3F-S19 Studio		88	-	-
Block B-3F-S19 Studio-Bathroom		90	-	-
Block B-3F-S20 Studio		85	-	-
Block B-3F-S20 Studio-Bathroom		133	-	-
Block B-3F-S21 Studio		92	-	-
Block B-3F-S21 Studio-Bathroom		138	-	-
Block B-3F-S22 Studio		94	-	-
Block B-3F-S22 Studio-Bathroom		138	-	-
Block B-3F-S23 Studio		90	-	-
Block B-3F-S23 Studio-Bathroom		136	-	-
Block B-GF-WC-Shower		92	-	-
Block B-S1F-8 Studio		69	-	-
Block A-2F-Core		52	-	-
Block A-2F-Corridor		65	-	-
Block A-2F-Lift		81	-	-
Block A-3F-Core		51	-	-
Block A-3F-Corridor		50	-	-
Block A-3F-Kitchen Cluster		152	-	-
Block A-3F-Lift		99	-	-
Block A-3F-Loft		46	-	-
Block A-B-GF-Circulation		62	-	-
Block A-GF-Core		50	-	-
Block A-GF-Entrance		68	-	-
Block A-GF-Lift		92	-	-
Block A-GF-Plant Space		108	-	-
Block A-GF-Retail-Retail Unit		77	15	10
Block A-GF-Retail-Retail Unit BOH		46	-	-
Block B-1F-Core		60	-	-
Block B-1F-Corridor		58	-	-
Block B-1F-Lift		78	-	-
Block B-2F-Core		74	-	-
Block B-2F-Corridor		58	-	-
Block B-2F-Lift		78	-	-
Block B-3F-Core		81	-	-
Block B-3F-Corridor		60	-	-
Block B-3F-Lift		74	-	-
Block B-3F-S23 CP		129	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-3F-Storage		130	-	-
Block B-GF-Bulk Storage		75	-	-
Block B-GF-Core		57	-	-
Block B-GF-Entrance		60	-	-
Block B-GF-Laundry		247	-	-
Block B-GF-Lift		88	-	-
Block B-GF-Lobby		70	-	-
Block B-GF-PBSA Amenity Space		78	-	-
Block B-GF-Retail Rear Access		58	-	-
Block B-1F-S7 Studio-CP		130	-	-
Block B-2F-S13 Studio-CP		129	-	-
Block B-2F-S14 Studio-CP		130	-	-
Block B-3F-S19 Studio-CP		130	-	-
Block B-3F-S20 Studio-CP		129	-	-
Block B-GF-Plant Room		99	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block A-1F-S1 Studio	NO (-61.2%)	NO
Block A-1F-S1 Studio-Bathroom	N/A	N/A
Block A-1F-S2 Studio	NO (-50.7%)	NO
Block A-1F-S2 Studio-Bathroom	N/A	N/A
Block A-1F-S3 Studio	NO (-65.7%)	NO
Block A-1F-S3 Studio-Bathroom	NO (-34%)	NO
Block A-2F-S4 Studio	NO (-63.3%)	NO
Block A-2F-S4 Studio-Bathroom	N/A	N/A
Block A-2F-S5 Studio	NO (-61.1%)	NO
Block A-2F-S6 Studio	NO (-63.4%)	NO
Block A-2F-S6 Studio-Bathroom	NO (-29%)	NO
Block A-2F-Studio-Bathroom	N/A	N/A
Block A-3F-R1 Bedroom	NO (-86.6%)	NO
Block A-3F-R1-Bathroom	N/A	N/A
Block A-3F-R2 Bedroom	NO (-88.2%)	NO
Block A-3F-R2-Bathroom	NO (-51.4%)	NO
Block B-1F-S7 Studio	NO (-56.4%)	NO
Block B-1F-S7 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S8 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S9 Studio	NO (-40%)	NO
Block B-1F-S9 Studio-Bathroom	N/A	N/A
Block B-1F-S10 Studio	NO (-39.3%)	NO
Block B-1F-S10 Studio-Bathroom	N/A	N/A
Block B-1F-S11 Studio	NO (-53%)	NO
Block B-1F-S11 Studio-Bathroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block B-1F-S12 Studio	NO (-64.3%)	NO
Block B-1F-S12 Studio-Bathroom	N/A	N/A
Block B-2F-S13 Studio	NO (-50.1%)	NO
Block B-2F-S13 Studio Bathroom	NO (-84.3%)	NO
Block B-2F-S14 Studio	NO (-75.6%)	NO
Block B-2F-S14 Studio-Bathroom	NO (-84.9%)	NO
Block B-2F-S15 Studio	NO (-40%)	NO
Block B-2F-S15 Studio -Bathroom	N/A	N/A
Block B-2F-S16 Studio	NO (-39.2%)	NO
Block B-2F-S16 Studio-Bathroom	N/A	N/A
Block B-2F-S17 Studio	NO (-52.8%)	NO
Block B-2F-S17 Studio-Bathroom	NO (-94.5%)	NO
Block B-2F-S18 Studio	NO (-83.3%)	NO
Block B-2F-S18 Studio-Bathroom	N/A	N/A
Block B-3F-S19 Studio	NO (-69.9%)	NO
Block B-3F-S19 Studio-Bathroom	NO (-92%)	NO
Block B-3F-S20 Studio	NO (-73.8%)	NO
Block B-3F-S20 Studio-Bathroom	NO (-84.3%)	NO
Block B-3F-S21 Studio	NO (-46.2%)	NO
Block B-3F-S21 Studio-Bathroom	N/A	N/A
Block B-3F-S22 Studio	NO (-70.8%)	NO
Block B-3F-S22 Studio-Bathroom	N/A	N/A
Block B-3F-S23 Studio	NO (-79.8%)	NO
Block B-3F-S23 Studio-Bathroom	N/A	N/A
Block B-GF-WC-Shower	N/A	N/A
Block B-S1F-8 Studio	NO (-36.5%)	NO
Block A-GF-Plant Space	N/A	N/A
Block A-GF-Retail-Retail Unit	NO (-5.8%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	1227.3	1227.3
External area [m ²]	2299.8	2299.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	466.43	737.57
Average U-value [W/m ² K]	0.2	0.32
Alpha value* [%]	40.35	25.85

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	27.19	37.64
Cooling	0.71	1.32
Auxiliary	14.59	11.81
Lighting	12.47	8.62
Hot water	149.05	144.28
Equipment*	30.64	30.64
TOTAL**	204.01	203.67

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

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	3.78	8.13
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>3.78</i>	<i>8.13</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	204.14	262.6
Primary energy [kWh _{PE} /m ²]	313.83	211.07
Total emissions [kg/m ²]	5.91	43.72

HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] District heating, [HFT] District Heating, [CFT] Electricity									
Actual	75.8	20.9	23.1	1.5	25.5	0.91	3.89	1	4.8
Notional	130.3	44	36.2	2.8	20.9	1	4.4	----	----
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity									
Actual	112.5	98.2	33.3	0	3.4	0.94	0	1	0
Notional	151	103.5	41.9	0	1.8	1	0	----	----
[ST] No Heating or Cooling									
Actual	17.3	1463.1	0	0	1.9	0	0	0	0
Notional	13.4	1474.2	0	0	2.6	0	0	----	----

Key to terms

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

Project name

807 High Road

As designed

Date: Fri Jan 26 11:35:19 2024

Administrative information

Building Details

Address: 807 High Road, London, N17 8ER

Certifier details

Name: P3r Engineers

Telephone number: 02074907848

Address: 70 Cowcross Street, London, EC1M 6EJ

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.23

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

Foundation area [m²]: 298.83The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	11.9
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	10.5
Target primary energy rate (TPER), kWh _{PE} /m ² .annum	128.23
Building primary energy rate (BPER), kWh _{PE} /m ² .annum	113.64
Do the building's emission and primary energy rates exceed the targets?	BER =< TER BPER =< TPER

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

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.14	0.2	3F00001B_W15_A0
Floors	0.18	0.12	0.2	2F000009_F_A0
Pitched roofs	0.16	0.11	0.11	3F000007_C
Flat roofs	0.18	0.15	0.2	2F000009_C_A2
Windows** and roof windows	1.6	1.04	1.04	1F00001A_W3_O0
Rooflights***	2.2	1.13	1.13	3F000007_C_O0
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Heat pumps

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	4.8	-	1.4	0.84
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	-	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.001
Standard value	N/A	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
Block A-1F-S1 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S1 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S2 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S2 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S3 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S3 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
Block A-2F-S4 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S4 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S5 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S8 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio -Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S23 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S23 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Block B-GF-WC-Shower	-	-	-	-	-	-	-	0.3	-	-	N/A
Block B-S1F-8 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-GF-Plant Space	0.3	-	-	-	-	-	-	-	-	-	N/A
Block B-GF-Plant Room	0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block A-1F-S1 Studio		95	-	-
Block A-1F-S1 Studio-Bathroom		126	-	-
Block A-1F-S2 Studio		89	-	-
Block A-1F-S2 Studio-Bathroom		133	-	-
Block A-1F-S3 Studio		88	-	-
Block A-1F-S3 Studio-Bathroom		135	-	-
Block A-2F-S4 Studio		95	-	-
Block A-2F-S4 Studio-Bathroom		126	-	-
Block A-2F-S5 Studio		89	-	-
Block A-2F-S6 Studio		88	-	-
Block A-2F-S6 Studio-Bathroom		136	-	-
Block A-2F-Studio-Bathroom		133	-	-
Block A-3F-R1 Bedroom		103	-	-
Block A-3F-R1-Bathroom		76	-	-
Block A-3F-R2 Bedroom		78	-	-
Block A-3F-R2-Bathroom		75	-	-
Block B-1F-S7 Studio		93	-	-
Block B-1F-S7 Studio-Bathroom		136	-	-
Block B-1F-S8 Studio-Bathroom		136	-	-
Block B-1F-S9 Studio		93	-	-
Block B-1F-S9 Studio-Bathroom		138	-	-
Block B-1F-S10 Studio		93	-	-
Block B-1F-S10 Studio-Bathroom		138	-	-
Block B-1F-S11 Studio		87	-	-
Block B-1F-S11 Studio-Bathroom		119	-	-
Block B-1F-S12 Studio		90	-	-
Block B-1F-S12 Studio-Bathroom		93	-	-
Block B-2F-S13 Studio		86	-	-
Block B-2F-S13 Studio Bathroom		142	-	-
Block B-2F-S14 Studio		86	-	-
Block B-2F-S14 Studio-Bathroom		138	-	-
Block B-2F-S15 Studio		93	-	-
Block B-2F-S15 Studio -Bathroom		96	-	-
Block B-2F-S16 Studio		93	-	-
Block B-2F-S16 Studio-Bathroom		138	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-2F-S17 Studio		88	-	-
Block B-2F-S17 Studio-Bathroom		116	-	-
Block B-2F-S18 Studio		85	-	-
Block B-2F-S18 Studio-Bathroom		145	-	-
Block B-3F-S19 Studio		88	-	-
Block B-3F-S19 Studio-Bathroom		90	-	-
Block B-3F-S20 Studio		85	-	-
Block B-3F-S20 Studio-Bathroom		133	-	-
Block B-3F-S21 Studio		92	-	-
Block B-3F-S21 Studio-Bathroom		138	-	-
Block B-3F-S22 Studio		94	-	-
Block B-3F-S22 Studio-Bathroom		138	-	-
Block B-3F-S23 Studio		90	-	-
Block B-3F-S23 Studio-Bathroom		136	-	-
Block B-GF-WC-Shower		92	-	-
Block B-S1F-8 Studio		69	-	-
Block A-2F-Core		52	-	-
Block A-2F-Corridor		65	-	-
Block A-2F-Lift		81	-	-
Block A-3F-Core		51	-	-
Block A-3F-Corridor		50	-	-
Block A-3F-Kitchen Cluster		152	-	-
Block A-3F-Lift		99	-	-
Block A-3F-Loft		46	-	-
Block A-B-GF-Circulation		62	-	-
Block A-GF-Core		50	-	-
Block A-GF-Entrance		68	-	-
Block A-GF-Lift		92	-	-
Block A-GF-Plant Space		108	-	-
Block A-GF-Retail-Retail Unit		77	15	10
Block A-GF-Retail-Retail Unit BOH		46	-	-
Block B-1F-Core		60	-	-
Block B-1F-Corridor		58	-	-
Block B-1F-Lift		78	-	-
Block B-2F-Core		74	-	-
Block B-2F-Corridor		58	-	-
Block B-2F-Lift		78	-	-
Block B-3F-Core		81	-	-
Block B-3F-Corridor		60	-	-
Block B-3F-Lift		74	-	-
Block B-3F-S23 CP		129	-	-
Block B-3F-Storage		130	-	-
Block B-GF-Bulk Storage		75	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-GF-Core		57	-	-
Block B-GF-Entrance		60	-	-
Block B-GF-Laundry		247	-	-
Block B-GF-Lift		88	-	-
Block B-GF-Lobby		70	-	-
Block B-GF-PBSA Amenity Space		78	-	-
Block B-GF-Retail Rear Access		58	-	-
Block B-1F-S7 Studio-CP		130	-	-
Block B-2F-S13 Studio-CP		129	-	-
Block B-2F-S14 Studio-CP		130	-	-
Block B-3F-S19 Studio-CP		130	-	-
Block B-3F-S20 Studio-CP		129	-	-
Block B-GF-Plant Room		99	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block A-1F-S1 Studio	NO (-61.2%)	NO
Block A-1F-S1 Studio-Bathroom	N/A	N/A
Block A-1F-S2 Studio	NO (-50.7%)	NO
Block A-1F-S2 Studio-Bathroom	N/A	N/A
Block A-1F-S3 Studio	NO (-65.7%)	NO
Block A-1F-S3 Studio-Bathroom	NO (-34%)	NO
Block A-2F-S4 Studio	NO (-63.3%)	NO
Block A-2F-S4 Studio-Bathroom	N/A	N/A
Block A-2F-S5 Studio	NO (-61.1%)	NO
Block A-2F-S6 Studio	NO (-63.4%)	NO
Block A-2F-S6 Studio-Bathroom	NO (-29%)	NO
Block A-2F-Studio-Bathroom	N/A	N/A
Block A-3F-R1 Bedroom	NO (-86.6%)	NO
Block A-3F-R1-Bathroom	N/A	N/A
Block A-3F-R2 Bedroom	NO (-88.2%)	NO
Block A-3F-R2-Bathroom	NO (-51.4%)	NO
Block B-1F-S7 Studio	NO (-56.4%)	NO
Block B-1F-S7 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S8 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S9 Studio	NO (-40%)	NO
Block B-1F-S9 Studio-Bathroom	N/A	N/A
Block B-1F-S10 Studio	NO (-39.3%)	NO
Block B-1F-S10 Studio-Bathroom	N/A	N/A
Block B-1F-S11 Studio	NO (-53%)	NO
Block B-1F-S11 Studio-Bathroom	N/A	N/A
Block B-1F-S12 Studio	NO (-64.3%)	NO
Block B-1F-S12 Studio-Bathroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block B-2F-S13 Studio	NO (-50.1%)	NO
Block B-2F-S13 Studio Bathroom	NO (-84.3%)	NO
Block B-2F-S14 Studio	NO (-75.6%)	NO
Block B-2F-S14 Studio-Bathroom	NO (-84.9%)	NO
Block B-2F-S15 Studio	NO (-40%)	NO
Block B-2F-S15 Studio -Bathroom	N/A	N/A
Block B-2F-S16 Studio	NO (-39.2%)	NO
Block B-2F-S16 Studio-Bathroom	N/A	N/A
Block B-2F-S17 Studio	NO (-52.8%)	NO
Block B-2F-S17 Studio-Bathroom	NO (-94.5%)	NO
Block B-2F-S18 Studio	NO (-83.3%)	NO
Block B-2F-S18 Studio-Bathroom	N/A	N/A
Block B-3F-S19 Studio	NO (-69.9%)	NO
Block B-3F-S19 Studio-Bathroom	NO (-92%)	NO
Block B-3F-S20 Studio	NO (-73.8%)	NO
Block B-3F-S20 Studio-Bathroom	NO (-84.3%)	NO
Block B-3F-S21 Studio	NO (-46.2%)	NO
Block B-3F-S21 Studio-Bathroom	N/A	N/A
Block B-3F-S22 Studio	NO (-70.8%)	NO
Block B-3F-S22 Studio-Bathroom	N/A	N/A
Block B-3F-S23 Studio	NO (-79.8%)	NO
Block B-3F-S23 Studio-Bathroom	N/A	N/A
Block B-GF-WC-Shower	N/A	N/A
Block B-S1F-8 Studio	NO (-36.5%)	NO
Block A-GF-Plant Space	N/A	N/A
Block A-GF-Retail-Retail Unit	NO (-5.8%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	1227.3	1227.3
External area [m ²]	2299.8	2299.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	466.43	737.57
Average U-value [W/m ² K]	0.2	0.32
Alpha value* [%]	40.35	25.85

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	7.55	14.26
Cooling	0.71	1.32
Auxiliary	14.59	11.81
Lighting	12.47	8.62
Hot water	41.4	50.45
Equipment*	30.64	30.64
TOTAL**	76.73	86.46

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

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0.06
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>0.06</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	204.14	262.6
Primary energy [kWh _{PE} /m ²]	113.64	128.23
Total emissions [kg/m ²]	10.5	11.9

HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	75.8	20.9	6.4	1.5	25.5	3.28	3.89	3.6	4.8
Notional	130.3	44	13.7	2.8	20.9	2.64	4.4	----	----
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	112.5	98.2	9.2	0	3.4	3.38	0	3.6	0
Notional	151	103.5	15.9	0	1.8	2.64	0	----	----
[ST] No Heating or Cooling									
Actual	17.3	1463.1	0	0	1.9	0	0	0	0
Notional	13.4	1474.2	0	0	2.6	0	0	----	----

Key to terms

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

Project name

807 High Road**As designed**

Date: Fri Jan 26 12:20:46 2024

Administrative information

Building Details

Address: 807 High Road, London, N17 8ER

Certifier details

Name: P3r Engineers

Telephone number: 02074907848

Address: 70 Cowcross Street, London, EC1M 6EJ

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.23

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

Foundation area [m²]: 298.83The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	11.9
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	10.01
Target primary energy rate (TPER), kWh _{PE} /m ² .annum	128.23
Building primary energy rate (BPER), kWh _{PE} /m ² .annum	108.07
Do the building's emission and primary energy rates exceed the targets?	BER =< TER BPER =< TPER

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

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.14	0.2	3F00001B_W15_A0
Floors	0.18	0.12	0.2	2F000009_F_A0
Pitched roofs	0.16	0.11	0.11	3F000007_C
Flat roofs	0.18	0.15	0.2	2F000009_C_A2
Windows** and roof windows	1.6	1.04	1.04	1F00001A_W3_O0
Rooflights***	2.2	1.13	1.13	3F000007_C_O0
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Heat pumps

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	4.8	-	1.4	0.84
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	-	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.001
Standard value	N/A	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
Block A-1F-S1 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S1 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S2 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S2 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S3 Studio	-	-	-	-	-	-	-	0.2	-	-	-	N/A
Block A-1F-S3 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
Block A-2F-S4 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S4 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S5 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-S6 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-2F-Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R1-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2 Bedroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-3F-R2-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S7 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S8 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S9 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S10 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S11 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-1F-S12 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S13 Studio Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S14 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S15 Studio -Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S16 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S17 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-2F-S18 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S19 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S20 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S21 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S22 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S23 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block B-3F-S23 Studio-Bathroom	-	-	-	-	-	-	-	0.2	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Block B-GF-WC-Shower	-	-	-	-	-	-	-	0.3	-	-	N/A
Block B-S1F-8 Studio	-	-	-	-	-	-	-	0.2	-	-	N/A
Block A-GF-Plant Space	0.3	-	-	-	-	-	-	-	-	-	N/A
Block B-GF-Plant Room	0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block A-1F-S1 Studio		95	-	-
Block A-1F-S1 Studio-Bathroom		126	-	-
Block A-1F-S2 Studio		89	-	-
Block A-1F-S2 Studio-Bathroom		133	-	-
Block A-1F-S3 Studio		88	-	-
Block A-1F-S3 Studio-Bathroom		135	-	-
Block A-2F-S4 Studio		95	-	-
Block A-2F-S4 Studio-Bathroom		126	-	-
Block A-2F-S5 Studio		89	-	-
Block A-2F-S6 Studio		88	-	-
Block A-2F-S6 Studio-Bathroom		136	-	-
Block A-2F-Studio-Bathroom		133	-	-
Block A-3F-R1 Bedroom		103	-	-
Block A-3F-R1-Bathroom		76	-	-
Block A-3F-R2 Bedroom		78	-	-
Block A-3F-R2-Bathroom		75	-	-
Block B-1F-S7 Studio		93	-	-
Block B-1F-S7 Studio-Bathroom		136	-	-
Block B-1F-S8 Studio-Bathroom		136	-	-
Block B-1F-S9 Studio		93	-	-
Block B-1F-S9 Studio-Bathroom		138	-	-
Block B-1F-S10 Studio		93	-	-
Block B-1F-S10 Studio-Bathroom		138	-	-
Block B-1F-S11 Studio		87	-	-
Block B-1F-S11 Studio-Bathroom		119	-	-
Block B-1F-S12 Studio		90	-	-
Block B-1F-S12 Studio-Bathroom		93	-	-
Block B-2F-S13 Studio		86	-	-
Block B-2F-S13 Studio Bathroom		142	-	-
Block B-2F-S14 Studio		86	-	-
Block B-2F-S14 Studio-Bathroom		138	-	-
Block B-2F-S15 Studio		93	-	-
Block B-2F-S15 Studio -Bathroom		96	-	-
Block B-2F-S16 Studio		93	-	-
Block B-2F-S16 Studio-Bathroom		138	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-2F-S17 Studio		88	-	-
Block B-2F-S17 Studio-Bathroom		116	-	-
Block B-2F-S18 Studio		85	-	-
Block B-2F-S18 Studio-Bathroom		145	-	-
Block B-3F-S19 Studio		88	-	-
Block B-3F-S19 Studio-Bathroom		90	-	-
Block B-3F-S20 Studio		85	-	-
Block B-3F-S20 Studio-Bathroom		133	-	-
Block B-3F-S21 Studio		92	-	-
Block B-3F-S21 Studio-Bathroom		138	-	-
Block B-3F-S22 Studio		94	-	-
Block B-3F-S22 Studio-Bathroom		138	-	-
Block B-3F-S23 Studio		90	-	-
Block B-3F-S23 Studio-Bathroom		136	-	-
Block B-GF-WC-Shower		92	-	-
Block B-S1F-8 Studio		69	-	-
Block A-2F-Core		52	-	-
Block A-2F-Corridor		65	-	-
Block A-2F-Lift		81	-	-
Block A-3F-Core		51	-	-
Block A-3F-Corridor		50	-	-
Block A-3F-Kitchen Cluster		152	-	-
Block A-3F-Lift		99	-	-
Block A-3F-Loft		46	-	-
Block A-B-GF-Circulation		62	-	-
Block A-GF-Core		50	-	-
Block A-GF-Entrance		68	-	-
Block A-GF-Lift		92	-	-
Block A-GF-Plant Space		108	-	-
Block A-GF-Retail-Retail Unit		77	15	10
Block A-GF-Retail-Retail Unit BOH		46	-	-
Block B-1F-Core		60	-	-
Block B-1F-Corridor		58	-	-
Block B-1F-Lift		78	-	-
Block B-2F-Core		74	-	-
Block B-2F-Corridor		58	-	-
Block B-2F-Lift		78	-	-
Block B-3F-Core		81	-	-
Block B-3F-Corridor		60	-	-
Block B-3F-Lift		74	-	-
Block B-3F-S23 CP		129	-	-
Block B-3F-Storage		130	-	-
Block B-GF-Bulk Storage		75	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
Block B-GF-Core		57	-	-
Block B-GF-Entrance		60	-	-
Block B-GF-Laundry		247	-	-
Block B-GF-Lift		88	-	-
Block B-GF-Lobby		70	-	-
Block B-GF-PBSA Amenity Space		78	-	-
Block B-GF-Retail Rear Access		58	-	-
Block B-1F-S7 Studio-CP		130	-	-
Block B-2F-S13 Studio-CP		129	-	-
Block B-2F-S14 Studio-CP		130	-	-
Block B-3F-S19 Studio-CP		130	-	-
Block B-3F-S20 Studio-CP		129	-	-
Block B-GF-Plant Room		99	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block A-1F-S1 Studio	NO (-61.2%)	NO
Block A-1F-S1 Studio-Bathroom	N/A	N/A
Block A-1F-S2 Studio	NO (-50.7%)	NO
Block A-1F-S2 Studio-Bathroom	N/A	N/A
Block A-1F-S3 Studio	NO (-65.7%)	NO
Block A-1F-S3 Studio-Bathroom	NO (-34%)	NO
Block A-2F-S4 Studio	NO (-63.3%)	NO
Block A-2F-S4 Studio-Bathroom	N/A	N/A
Block A-2F-S5 Studio	NO (-61.1%)	NO
Block A-2F-S6 Studio	NO (-63.4%)	NO
Block A-2F-S6 Studio-Bathroom	NO (-29%)	NO
Block A-2F-Studio-Bathroom	N/A	N/A
Block A-3F-R1 Bedroom	NO (-86.6%)	NO
Block A-3F-R1-Bathroom	N/A	N/A
Block A-3F-R2 Bedroom	NO (-88.2%)	NO
Block A-3F-R2-Bathroom	NO (-51.4%)	NO
Block B-1F-S7 Studio	NO (-56.4%)	NO
Block B-1F-S7 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S8 Studio-Bathroom	NO (-84.9%)	NO
Block B-1F-S9 Studio	NO (-40%)	NO
Block B-1F-S9 Studio-Bathroom	N/A	N/A
Block B-1F-S10 Studio	NO (-39.3%)	NO
Block B-1F-S10 Studio-Bathroom	N/A	N/A
Block B-1F-S11 Studio	NO (-53%)	NO
Block B-1F-S11 Studio-Bathroom	N/A	N/A
Block B-1F-S12 Studio	NO (-64.3%)	NO
Block B-1F-S12 Studio-Bathroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block B-2F-S13 Studio	NO (-50.1%)	NO
Block B-2F-S13 Studio Bathroom	NO (-84.3%)	NO
Block B-2F-S14 Studio	NO (-75.6%)	NO
Block B-2F-S14 Studio-Bathroom	NO (-84.9%)	NO
Block B-2F-S15 Studio	NO (-40%)	NO
Block B-2F-S15 Studio -Bathroom	N/A	N/A
Block B-2F-S16 Studio	NO (-39.2%)	NO
Block B-2F-S16 Studio-Bathroom	N/A	N/A
Block B-2F-S17 Studio	NO (-52.8%)	NO
Block B-2F-S17 Studio-Bathroom	NO (-94.5%)	NO
Block B-2F-S18 Studio	NO (-83.3%)	NO
Block B-2F-S18 Studio-Bathroom	N/A	N/A
Block B-3F-S19 Studio	NO (-69.9%)	NO
Block B-3F-S19 Studio-Bathroom	NO (-92%)	NO
Block B-3F-S20 Studio	NO (-73.8%)	NO
Block B-3F-S20 Studio-Bathroom	NO (-84.3%)	NO
Block B-3F-S21 Studio	NO (-46.2%)	NO
Block B-3F-S21 Studio-Bathroom	N/A	N/A
Block B-3F-S22 Studio	NO (-70.8%)	NO
Block B-3F-S22 Studio-Bathroom	N/A	N/A
Block B-3F-S23 Studio	NO (-79.8%)	NO
Block B-3F-S23 Studio-Bathroom	N/A	N/A
Block B-GF-WC-Shower	N/A	N/A
Block B-S1F-8 Studio	NO (-36.5%)	NO
Block A-GF-Plant Space	N/A	N/A
Block A-GF-Retail-Retail Unit	NO (-5.8%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	1227.3	1227.3
External area [m ²]	2299.8	2299.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	466.43	737.57
Average U-value [W/m ² K]	0.2	0.32
Alpha value* [%]	40.35	25.85

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	7.55	14.26
Cooling	0.71	1.32
Auxiliary	14.59	11.81
Lighting	12.47	8.62
Hot water	41.4	50.45
Equipment*	30.64	30.64
TOTAL**	76.73	86.46

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

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	3.78	0.06
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>3.78</i>	<i>0.06</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	204.14	262.6
Primary energy [kWh _{PE} /m ²]	108.07	128.23
Total emissions [kg/m ²]	10.01	11.9

HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	75.8	20.9	6.4	1.5	25.5	3.28	3.89	3.6	4.8
Notional	130.3	44	13.7	2.8	20.9	2.64	4.4	----	----
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	112.5	98.2	9.2	0	3.4	3.38	0	3.6	0
Notional	151	103.5	15.9	0	1.8	2.64	0	----	----
[ST] No Heating or Cooling									
Actual	17.3	1463.1	0	0	1.9	0	0	0	0
Notional	13.4	1474.2	0	0	2.6	0	0	----	----

Key to terms

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