ENERGY & SUSTAINABILITY STATEMENT

44-46 HAMPSTEAD LANE, LONDON N6 4LL

FHP ENGINEERING SERVICES SOLUTIONS LTD
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ASSESSMENT INFORMATION

Prepared for:
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12 March 2024

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DISCLAIMER

The findings, conclusions and recommendations of this report are based on the information supplied. FHPESS disclaims responsibility in respect of incorrect information imparted to them or for the actual performance of any of the building services installations.
This report is prepared for the use of 44-46 Hampstead Lane; a duty of care is not owed to other parties.

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The 2021 London Plan approach of "Be lean" – "Be clean" – "Be green" is fully adopted by implementing:

- Passive measures (low U-values and air permeability) High efficiency services, i.e. low energy lights, high efficiency ventilation with heat recovery, waste water heat recovery
- Renewable sources: Air source heat pumps, Photovoltaic system with a peak output of 24 kWp,

Excluded renewable sources are:

- Solar hot water
- Biomass
- Wind turbines

The proposed development will achieve:

- 37% regulated CO2 reduction against 2021 Part L compliant baseline
- 16% regulated CO2 reduction by efficiency measures (Be Lean)
- 41% regulated CO2 reduction by renewable sources
- £63,312 will be paid to the carbon offset fund

ABOUT THE ENERGY STATEMENT

FHP ESS have been appointed to provide an Energy Statement for the proposed development.

This statement covers possible active and passive measures including renewable energy sources to make this development sustainable and environmentally friendly.

Specific requirements of London Plan on Energy Efficiency and Renewable Energy will be met through a combination of passive design features, energy efficient building services and renewable energy sources. This is to comply fully with the London Plan Policies and ensure they are following the

"Energy Hierarchy". Specific London Plan policies about CO2 reduction and renewable energy will be met by implementation of passive measures, efficient services and renewable sources. This document has been prepared in line with the GLA Energy Team Guidance on Planning Energy Assessments.

Baseline and all estimated energy consumptions have been calculated using full SBEM v6.1.c assessment of the development in accordance with Part L procedures.

The tables below show a summary of energy requirements for baseline scheme and reduction proposed to be achieved by passive measures, efficient services and on-site renewable energy sources.

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-residential buildings

	Carbon Dioxide Emissions for non-residential buildings (Tonnes CO_2 per annum)	
	Regulated	**Unregulated**
Baseline: Part L 2021 of the Building Regulations Compliant Development	35.2	21.6
After energy demand reduction (be lean)	29.5	21.6
After heat network connection (be clean)	29.5	21.6
After renewable energy (be green)	22.2	21.6

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-residential buildings

	Regulated non-residential carbon dioxide savings	
	(Tonnes CO_2 per annum)	**(%)**
Be lean: savings from energy demand reduction	5.7	16%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	7.3	21%
Total Cumulative Savings	**13.0**	**37%**
Annual savings from off-set payment	22.2	-
	(Tonnes CO_2)	
Cumulative savings for off-set payment	**666**	-
Cash in-lieu contribution (£)	**63,312**	

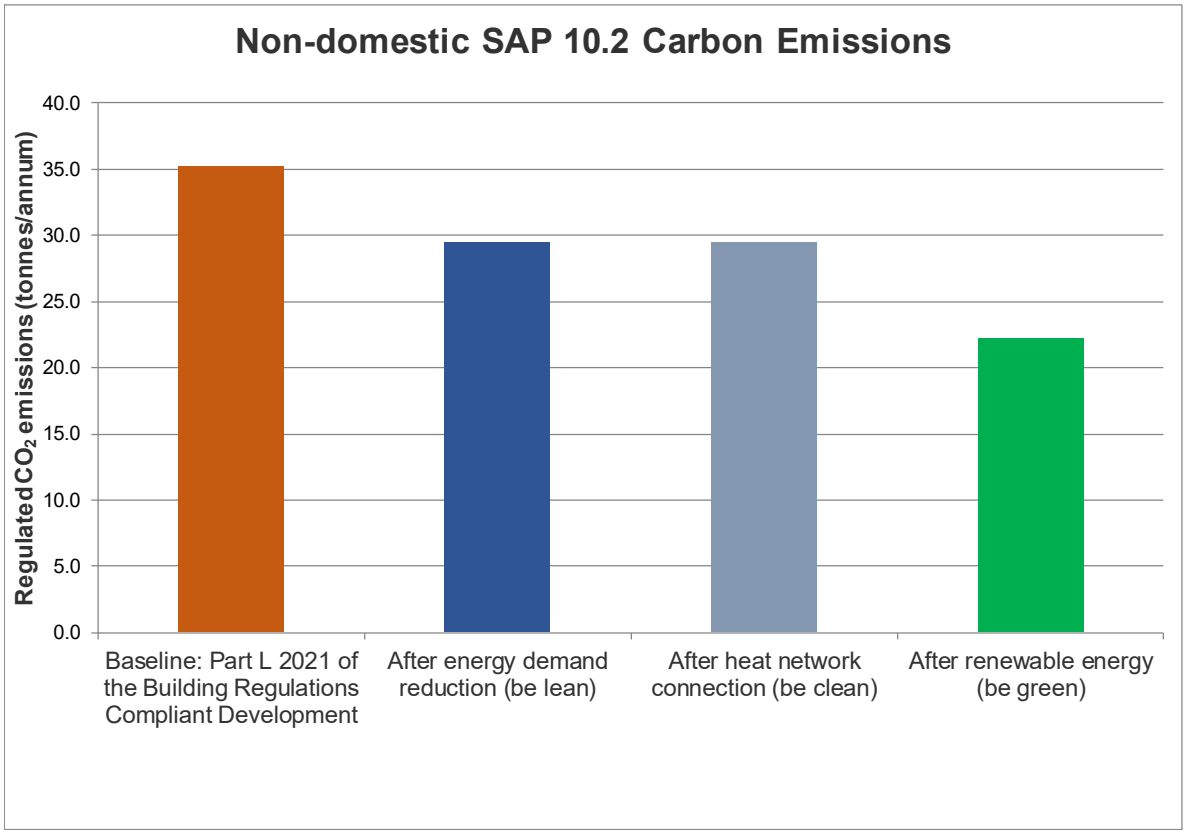

Table 3: SBEM calculation specification for each stage of the energy hierarchy

Specification	Notional Baseline	Efficient Baseline (Be Lean)	Proposed Development (Be Green)
Basement floor, ground floor and floor above car park U-value	0.15	0.11	0.11
External Wall U-value	0.18	0.16	0.16
Roof U-value	0.15	0.13	0.13
Windows U-value	1.4	1.2	1.2
External doors U-value	1.9	1.5	1.5
Windows g-value	0.40	0.40	0.40
Air Permeability	3	3	3
Thermal bridging	Psi-values compliant with accredited details	Psi-values compliant with accredited details; window lintels to be keystone Hi Therm lintels or equivalent with a psi-value of 0.05 W/mK	Psi-values compliant with accredited details; window lintels to be keystone Hi Therm lintels or equivalent with a psi-value of 0.05 W/mK
Space Heating System	Heat pump wit SCoP of 2.64	Heat pump wit SCoP of 2.64	Air source heat pump system with low temperature wet underfloor heating with SCoP of 3.99 or higher
Space Cooling System resident units and communal areas (lounges, dining etc)	VRF system with SEER of 2.25	VRF system with SEER of 4.92	VRF system with SEER of 4.92
DHW System	Heat pump wit SCoP of 2.86	Heat pump wit SCoP of 2.86; all showers fitted with waste water heat recovery system Recoup Pipe+ HE or equivalent with a seasonal efficiency of 49% or higher	Air source heat pump system with SCoP of 3.99 or higher, all showers fitted with waste water heat recovery system Recoup Pipe+ HE or equivalent with a seasonal efficiency of 49% or higher
Ventilation System - resident units and communal areas (lounges, dining etc)	Natural with intermittent mechanical extracts	Individual MVHR units with SFP of 0.5 W/l.s or less, heat recovery efficiency 80% or higher	Individual MVHR units with SFP of 0.5 W/l.s or less, heat recovery efficiency 80% or higher
Lighting	Average luminaire efficacy 95 lm/cW, occupancy sensors, metering of electricity for lighting with 'out of range' alarm	Average luminaire efficacy 110 lm/cW, occupancy sensors, metering of electricity for lighting with 'out of range' alarm	Average luminaire efficacy 110 lm/cW, occupancy sensors, metering of electricity for lighting with 'out of range' alarm
Power factor	95	95 (power factor correction device is required)	95 (power factor correction device is required)
Renewable energy sources			ASHP as described above + PV system with total peak output of 24 kWp, panels installed on flat roof with East/West orientation at 10° angle (e.g. 60 No 400W panels)
% Improvement in CO2 over Building regulations compliant baseline	**0.0%**	**16.3%**	**37%**

SBEM results summary of the proposed development

NON-RESIDENTIAL ENERGY CONSUMPTION AND CO_2 ANALYSIS (PART L2)												
Use	**Area per unit (m^2)**	**REGULATED ENERGY CONSUMPTION BY END USE (kWh/m² p.a.) 'BE GREEN' BER - SOURCE: BRUKL OUTPUT**								**REGULATED CO_2 EMISSIONS BY FUEL TYPE ($kgCO_2/m^2$ p.a.) - BER**		
		Space Heating (kWh/m² p.a.)	**Fuel type Space Heating**	**Domestic Hot Water (kWh/m² p.a.)**	**Fuel type Domestic Hot Water**	**Electricity generated by renewable technology (-)**	**Lighting (kWh/m² p.a.)**	**Auxiliary (kWh/m² p.a.)**	**Cooling (kWh/m² p.a.)**	**Grid Electricity**	**Electricity generated by renewable technology (-)**	**Part L 2021 CO_2 emissions ($kgCO_2$ p.a.)**
Care Home	*4391.35*	*2.7942*	*Grid Electricity*	*15.9763*	*Grid Electricity*	*-4.19801*	*7.14149*	*7.81261*	*7.51735*	**5.59**	**-0.53**	**22,215**
Sum		**12,270**	**N/A**	**70,158**	**N/A**	**-18,435**	**31,361**	**34,308**	**33,011**	**24,529**	**-2,314**	***22,215***

BACKGROUND

FHPESS have been appointed to provide an Energy Statement for the proposed development.
This statement covers possible active and passive measures including renewable energy sources to make this development sustainable and environmentally friendly.

DESCRIPTION OF THE SITE

The project at 44-46 Hamstead Lane includes demolition of the existing houses on site and new construction of a high quality care home with underground parking and single occupancy studios arranged over 4 storeys (Lower ground – 2nd floor).

NATIONAL POLICY

DCLG sets out basis for local policies in section 14 of National Planning Policy Framework. It requires new development to be planned in ways that can help to reduce greenhouse gas emissions, such as through its location, orientation and design. To help increase the use and supply of renewable and low carbon energy and heat, plans are encouraged to:
a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);
b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and
c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

THE NEW LONDON PLAN

The London Plan is the name given to the Mayor's spatial development strategy. The current version of London Plan was adopted in March 2021. The aim is to develop London as an exemplary sustainable world city, based on three interwoven themes.

- Strong, diverse long term economic growth
- Social inclusivity to give all Londoners the opportunity to share in London's future success
- Fundamental improvements in London's environment and use of resources.

Specific requirements on development sustainability are set out in the following policies:

POLICY SI 2 MINIMISING CO2 EMISSIONS

A. Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak

energy demand in accordance with the following energy hierarchy:
1) be lean: use less energy and manage demand during operation
2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
4) be seen: monitor, verify and report on energy performance.

B. Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

C. A minimum on-site reduction of at least 35 per cent beyond Building Regulations 152 is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:

1) through a cash in lieu contribution to the borough's carbon offset fund, or

2) off-site provided that an alternative proposal is identified and delivery is certain.

D. Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.

POLICY SI 3 D – ENERGY INFRASTRUCTURE

Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:

1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:
   a) connect to local existing or planned heat networks
   b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
   c) use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network)
   d) use ultra-low NOx gas boilers

2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality

3) where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date.

POLICY SI 4 – MANAGING HEAT RISK

A. Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.
B. Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

   1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
   2) minimise internal heat generation through energy efficient design

3) manage the heat within the building through exposed internal thermal mass and high ceilings
4) provide passive ventilation
5) provide mechanical ventilation
6) provide active cooling systems.

SUMMARY

An overheating analysis has been performed in order to assess performance of the proposed development against CIBSE TM59, defining criteria of thermal comfort, and CIBSE TM49 urban climate projections

A sample of the worst case top floor bedroom units has been modelled:

- F2-01 – West facing unit
- F2-14 – South / West facing unit
- F2-15, F2-16, F2-18 – South facing units
- Dining-lounge

The predicted internal temperature was simulated considering all aspects of occupancy, solar gain and predicted internal heat gains. Specific weather files have been applied to the model to assess the building performance against urban heat island effects and projected future climate conditions.

The calculation results show that the tested residential units don't comply with the TM59 thermal comfort overheating criteria using the main TM49 weather file (DSY1) for the 'future near extreme summer'. This is due to lack of sufficient natural ventilation through windows.

RESIDENTIAL CRITERIA
CIBSE TM59

Compliance is based on passing both of the following two criteria:

Criterion 1a: Hours of Exceedence (He):

For living rooms, kitchens and bedrooms:
Same as CIBSE TM52 Criterion 1.

Criterion 1b:

For bedrooms only:
to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26 °C for more than 1% of annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C is recorded as a fail).

For mechanically ventilated dwellings:
all occupied rooms should not exceed an operative temperature of 26 ˚C for more than 3% of the annual occupied annual hours

CIBSE TM49 REQUIREMENTS

Overheating is assessed using CIBSE TM49 future weather files to provide a risk-based analysis of the summer performance of a building under the impact of both the local microclimatic Urban Heat Island (UHI) effect, and the macroclimatic effect of an uncertain climate future.

The analysis behind the TM49 requirements has identified a substantial increase in the likelihood of warmer summers in the future, with the more extreme historical summers becoming average summers by the middle of the century. This is the period over which most buildings built today will be in operation. Hence it is recommended to evaluate overheating risk using climate change-adjusted weather data. With reference to the latest climate projections for the UK (UKCP09 projections), the future weather files utilise three years of varying severity of hot events:

DSY1 - 1989: a moderately warm summer. This is the current design summer year for London, with which the scheme should comply to demonstrate resilience to overheating.

DSY2 - 2003: a year with a brief yet extreme heat wave. It is not mandatory for the building to comply: as such this data has been used to evaluate risk and inform the design.

DSY3 - 1976: a year with a prolonged period of sustained warmth. It is not mandatory for the building to comply: as such this data has been used to evaluate risk and inform the design.

DYNAMIC SIMULATIONS

The analysis was carried out using DesignBuilder 7.1.2.006 - EnergyPlus v9 engine. The 3D model is based on the architectural drawings by Wolff Architects.
Thermal mass is modelled as follows:

- External walls: Masonry cavity walls, dense plaster
- Internal walls: Lightweight insulated metal frame walls with plasterboard
- Internal floors: Flooring, screed, insulation, concrete slab, suspended plasterboard ceiling
- Roof: Lightweight warm roof / pitched roof with insulation at rafter level

INTERNAL DESIGN CONDITIONS

Occupancy and equipment loads in the care home studios are modelled as per CIBSE TM59 Table 2

Unit/ room type	Occupancy	Equipment load
Studio	2 people at all times	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 5% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm 1 person at full gain in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double bed)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only; see section 3.1 above

* All times in GMT

Lighting is modelled as 2 W/m2 from 6pm to 11pm.

SOLAR GAINS AND SOLAR SHADING

The modelling has been carried out using standard low-e coated double glazing with a g-value of 0.4

VENTILATION

Ventilation strategy for the building has been chosen in line with London Plan Cooling hierarchy and with energy efficiency impacts in mind. It is proposed to install individual continuous mechanical ventilation units with heat recovery in all residents areas, common spaces and offices.

Natural ventilation through openable windows is not included for safety reasons as rooms may be occupied by residents with dementia. All ventilation requirements will therefore be provided by mechanical ventilation.

COMFORT COOLING

As shown in the table below, compliance with TM59 thermal comfort criteria is not achieved after applying all steps of the cooling hierarchy. Comfort cooling by high efficiency air source VRF system will be therefore included, as the last step in the cooling hierarchy. The cooling system will be sized to provide sufficient thermal comfort in future expected climate temperatures.

OVERHEATING SIMULATION RESULTS – DSY1 (WITHOUT COOLING)

Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
Din-lounge	8.68	N/A	Fail
F2-01	23.29	671	Fail
F2-14	49.99	875	Fail
F2-15	39.39	812	Fail
F2-16	32.81	758	Fail
F2-18	44.52	876.5	Fail

BASELINE EENRGY CONSUMPTION AND CO2 EMISSION

BASELINE ENERGY CONSUMPTION & CO2 EMISSIONS

Energy assessment using SBEM v6.1.c has been carried out for the building using notional baseline (TER) specification achieving compliance with 2021 Part L. The specification is set out in Table 3 above.

As a result of the baseline energy calculation, the following values of energy and CO_2 emissions have been obtained. SAP10.2 carbon emission factors have been used for the CO_2 emissions calculation.

NON-RESIDENTIAL ENERGY CONSUMPTION AND CO_2 ANALYSIS (PART L2)										
Building Use	Model Area (m²)	REGULATED ENERGY CONSUMPTION BY END USE (kWh/m² p.a.) TER - SOURCE: BRUKL OUTPUT							REGULATED CO_2 EMISSIONS BY FUEL TYPE (kgCO2/m² p.a.) TER - SOURCE: *SIM.CSV FILE	
		Space Heating (kWh/m² p.a.)	Fuel type Space Heating	Domestic Hot Water (kWh/m² p.a.)	Fuel type Domestic Hot Water	Lighting (kWh/m² p.a.)	Auxiliary (kWh/m² p.a.)	Cooling (kWh/m² p.a.)	Grid Electricity	Part L 2021 CO_2 emissions (kgCO_2 p.a.)
Care Home	*4391.35*	*4.74321*	*Grid Electricity*	*29.3374*	*Grid Electricity*	*7.23598*	*10.0213*	*7.68786*	8	35,231
Sum		20,829	N/A	128,831	N/A	31,776	44,007	33,760	35,231	***35,231***

BE LEAN: PASSIVE DESIGN MEASURES AND EFFICIENT SERVICES

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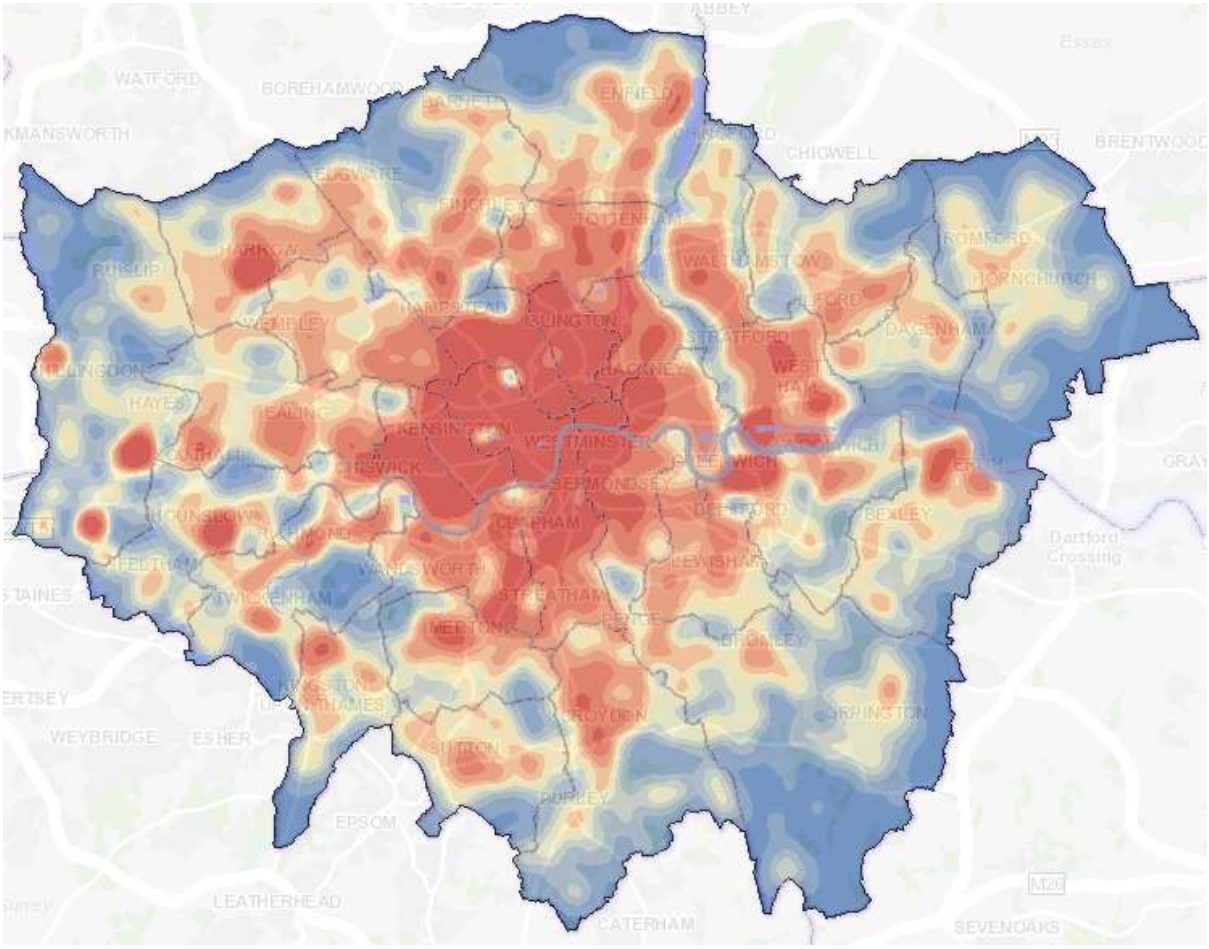
Number of passive design measures and measures improving energy efficiency of building services have been included in the design to help to reduce the CO2 emissions. Full specification of the efficient baseline is described in Table 3.
The following table shows results obtained with the improvements over the notional baseline

NON-RESIDENTIAL ENERGY CONSUMPTION AND CO_2 ANALYSIS (PART L2)											
		REGULATED ENERGY CONSUMPTION BY END USE (kWh/m² p.a.) 'BE LEAN' BER - SOURCE: *SIM.CSV FILE							REGULATED CO_2 EMISSIONS BY FUEL TYPE ($kgCO_2$/m² p.a.) - BER BRUKL - SOURCE: *SIM.CSV		
		Space Heating (kWh/m² p.a.)	Fuel type Space Heating	Domestic Hot Water (kWh/m² p.a.)	Fuel type Domestic Hot Water	Lighting (kWh/m² p.a.)	Auxiliary (kWh/m² p.a.)	Cooling (kWh/m² p.a.)	Natural Gas	Grid Electricity	Part L 2021 CO_2 emissions ($kgCO_2$ p.a.)
Building Use	Model Area (m²)										
Care Home	*4391.35*	*4.22371*	*Grid Electricity*	*22.7134*	*Grid Electricity*	*7.14149*	*7.81261*	*7.51735*	0	7	29,489
Sum		18,548	N/A	99,742	N/A	31,361	34,308	33,011	0	29,489	*29,489*

LONDON HEAT MAP

The London Heat Map (shown below) has been consulted to establish the possibility of connecting to heating infrastructure. There are no existing networks present within connectable range of the scheme, therefore a connection is not possible.



BE CLEAN: COMBINED HEAT AND POWER

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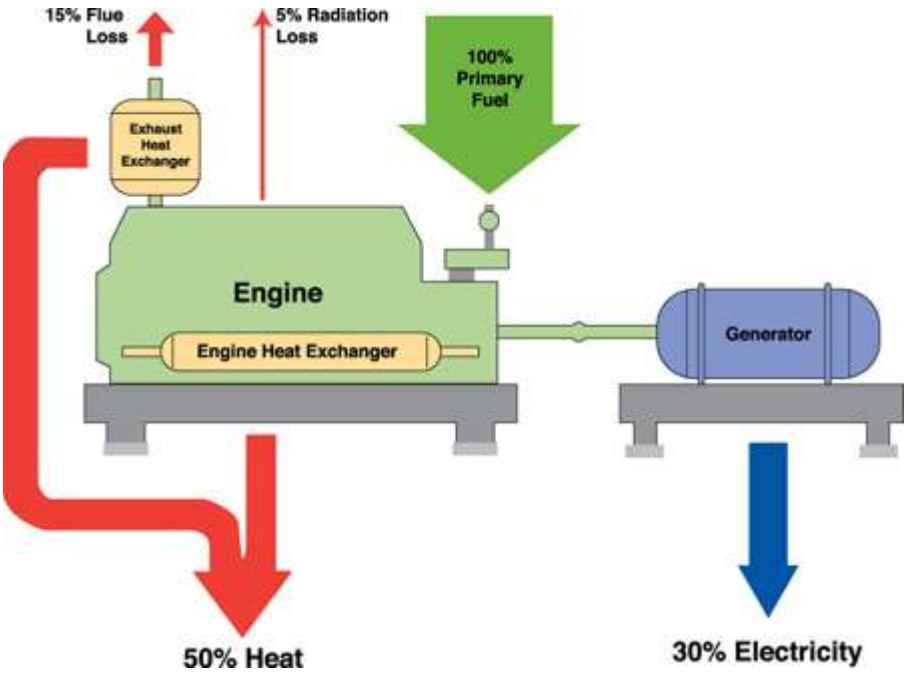
GENERAL INFORMATION

Although not using any renewable energy source, gas CHP helps to reduce CO2 emissions by delivering heat and electricity locally and reducing the losses that normally occur by conventional power plants. Produced electricity can be exported to grid if the on-site demand is lower than production.



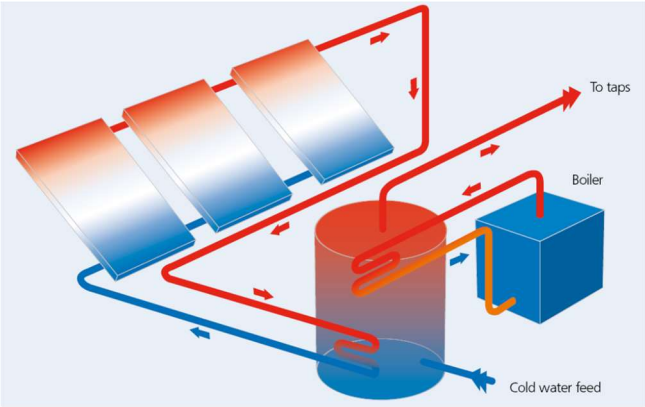
RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

CHP is no longer considered suitable due to low electricity carbon facor in SAP10

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES – SOLAR HOT WATER

GENERAL INFORMATION

Solar hot water systems for dwellings use collector which provides a separate heating circuit for hot water cylinder. This is usually backed up by electric immersion heater or other source of heat.
Two types of collectors are available:
- Flat Plate – less expensive, less efficient
- Evacuated Tube – more expensive and more efficient



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

A communal solar hot water system is considered to be not feasible due to long pipe runs from roof to plant room. Photovoltaic panels are preferable due to higher CO2 emission offset, lower installation and maintenance cost.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - AIR SOURCE HEAT PUMPS

GENERAL INFORMATION

An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can extract heat from the air even when the outside temperature is as low as minus 15° C.

On 17 December 2008, the European Parliament adopted the EU Directive on promoting the use of energy from renewable sources. For the first time however, in addition to geothermal energy, aerothermal and hydrothermal energy are also recognised as renewable energy sources.

There are two main types of ASHP:

AIR-TO-WATER SYSTEM

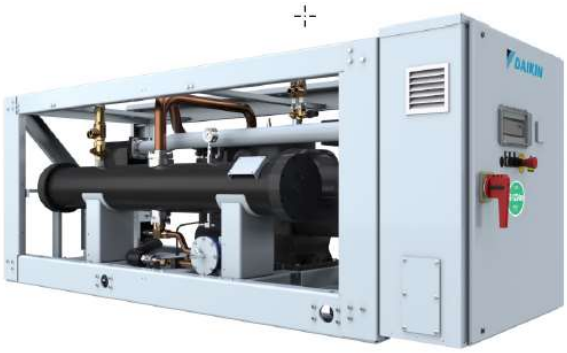
Air-to-water system uses the heat to warm water. Heat pumps heat water to a lower temperature than a standard boiler system would, so they are more suitable for underfloor heating systems than radiator systems. Although some ASHP systems are capable of heating the water to the higher temperature, the efficiency is higher when using low temperature underfloor heating or low temperature fan convectors.

AIR-TO-AIR SYSTEM

Air-to-air system uses the heat to warm the indoor air. The air is heated through individual fan-coils or centrally and then distributed to rooms via ductwork.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

It is proposed to install a cascade system manufactured by DAIKIN or equivalent ASHP system, which will comprise air source heat pumps for space heating (through wet underfloor heating), space cooling and hot water generation. The system shall have a minimum SCoP of 3.99 for the space heating and DHW and a cooling SEER of 4.92.



BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - SOLAR PHOTOVOLTAICS

GENERAL INFORMATION

This system uses semi-conductor cells to convert solar energy into electricity. Two main types of PV panels are available:
- Monocrystalline – More expensive and more efficient
- Polycrystalline – Less expensive and less efficient

Depending on type, the output of 1 kWp (kilowatt peak) can be achieved by panels with area between 6 and 20 m2.

The use of PV panels generally requires relatively large unshaded roof area where they can be mounted facing south, ideally having between 30° and 40° inclination.

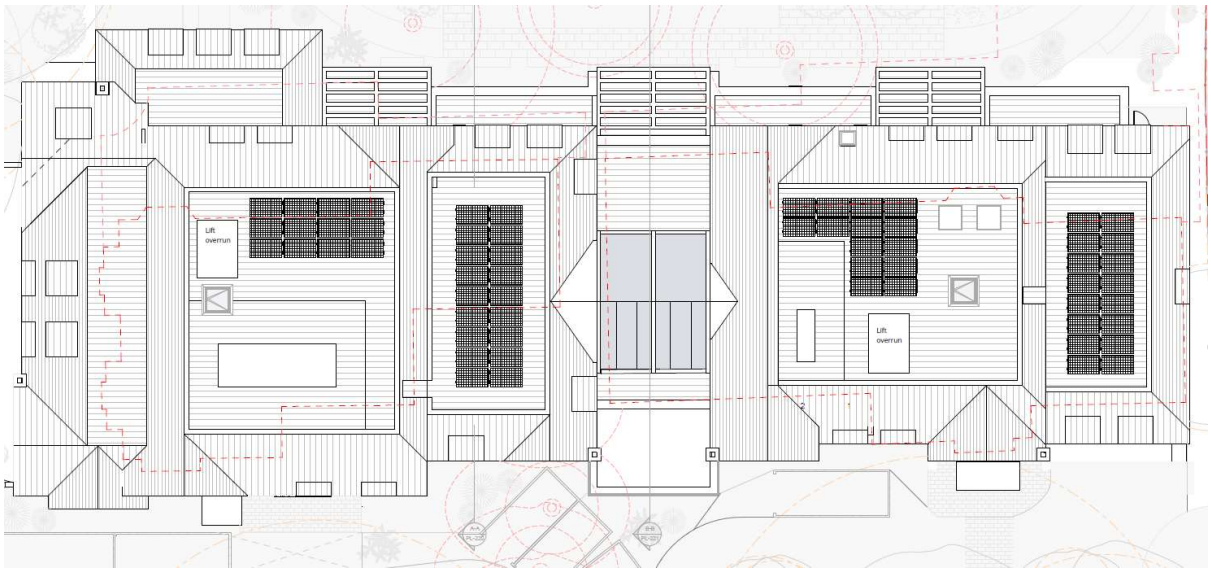
RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

It is proposed to install a PV system with total peak output of 24 kWp, with panels installed horizontally or at a low angle (10° or less) on the flat roof. This amount of PV has been ascertained as a maximum, that can fit on the available flat roof. Large part of the roof area will be taken by the air source heat pumps. The proposed PV will fully address the requirement that all development proposals are expected to maximise on-site renewable energy generation regardless of whether the minimum on-site target has already been achieved.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

44-46 HAMPSTEAD LANE, LONDON N6 4LL

The system will comprise 60 No PV apnels with 400 W peak output each as shown on the roof plan

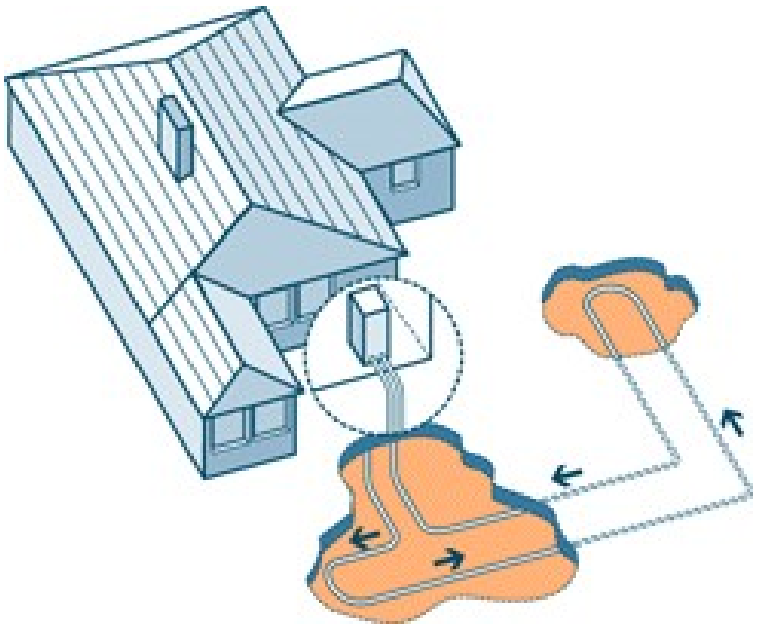


BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - GROUND SOURCE HEAT PUMP

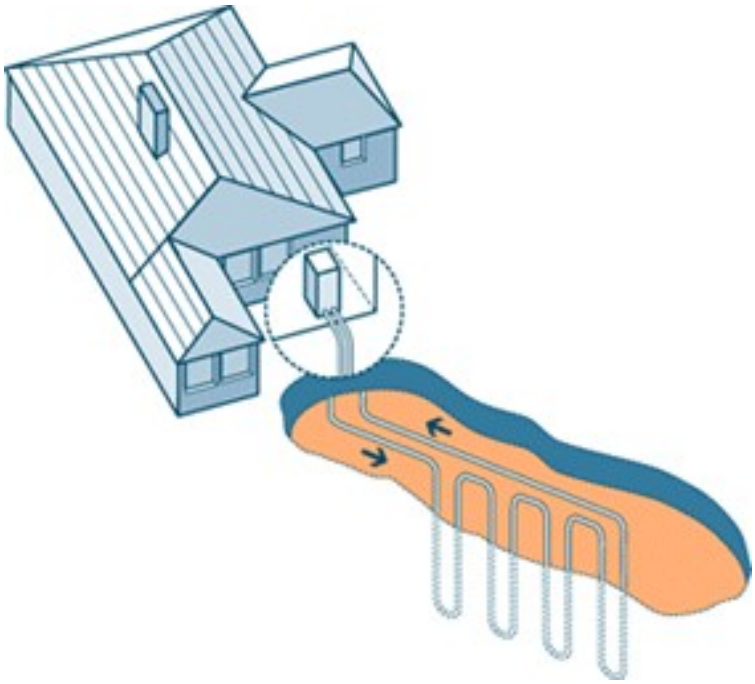
GENERAL INFORMATION

Ground source heat pumps use a buried ground loop which transfers heat from the ground into the building through heating distribution system. GSHP technology can be used both for heating and cooling. Two main types of GSHP are available:

- Horizontal loop is suitable for applications where sufficient area is available to accommodate horizontally buried pipes



- Vertical loop system can be used where ground space is limited, but will require boreholes typically 15-150m deep, and is consequently more expensive to install than horizontal systems.



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Ground source heat pumps have been ruled out due to significantly higher capital cost and relative small energy saving compared to the proposed air source system.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - BIOMASS / BIOFUELS

GENERAL INFORMATION

Producing energy from biomass has both environmental and economic advantages. It is a carbon neutral process as the CO2 released when energy is generated from biomass is balanced by that absorbed during the fuel's production.
There are two main ways of using biomass to heat a domestic property:

- Standalone stoves providing space heating for a room. These can be fuelled by logs or pellets but only pellets are suitable for automatic feed. Generally they are 6-12 kW in output, and some models can be fitted with a back boiler to provide water heating.

- Boilers connected to central heating and hot water systems. These are suitable for pellets, logs or chips, and are generally larger than 15 kW.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Biofuels are ruled out due to negative impact on air quality and environmental issues surrounding liquid biofuels as currently there are no established standards relating to the sustainability of biofuels.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - WIND ENERGY

GENERAL INFORMATION

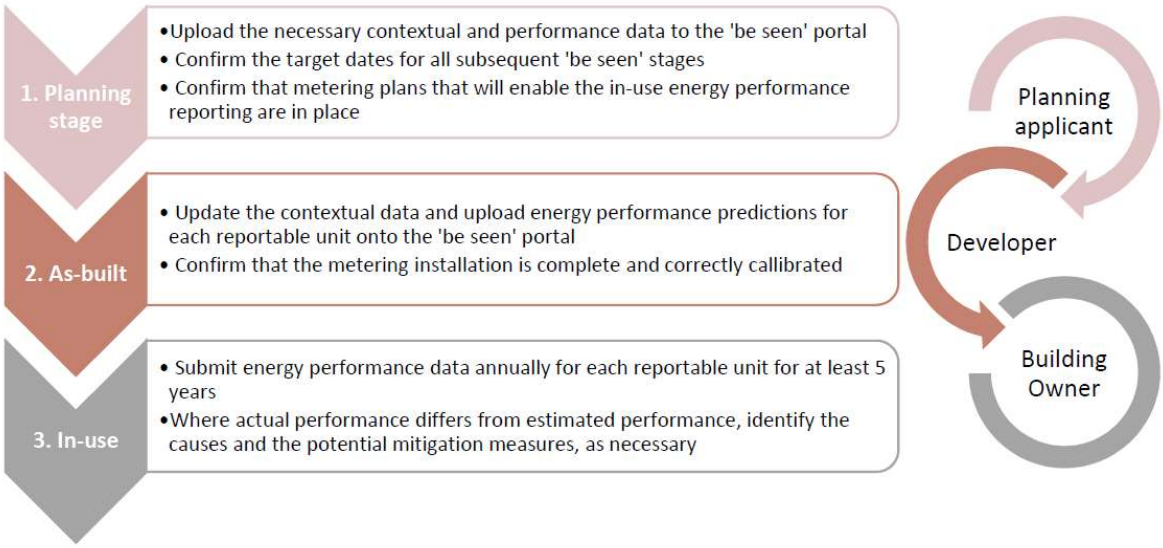
Wind power is a clean, renewable source of energy which produces no carbon dioxide emissions or waste products. The turbines can have horizontal or vertical axis (Darrieus type). Wind turbines use the wind's lift forces to rotate aerodynamic blades that turn a rotor which creates electricity. Most small wind turbines generate direct current (DC) electricity and are not connected to the national grid. A special inverter and controller is required to convert DC electricity to AC at a quality and standard acceptable to the grid if the turbine is to be connected to national grid.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Wind energy systems will not be considered due to negative visual effects, interference, flicker and noise risk. Exposure to wind would be limited by surrounding buildings.

New London Plan Policy SI 2 sets out the 'be seen' requirement for all major development proposals to monitor and report on their actual operational energy performance. The 'be seen' policy will help to understand the performance gap and identify ways of closing it while ensuring compliance with London's net zero-carbon target.

To fully address the "be seen" requirements, the development will be designed to enable post construction monitoring and the information set out in the 'be seen' guidance will be submitted to the GLA's portal at the appropriate reporting stages



Internal Water consumption will be reduced by specification of water efficient fittings. The water consumption in the proposed studios will be reduced to 105 litres per person per day or less by specifying water fittings with the following parameters:

WC's: All dual flush capacity 3/6 Litres or less
Bathroom taps flow rate: 6 l/min or less
Showers flow rate: 10 l/min or less

The proposed development will embrace sustainability aspects in line with BREEAM, although formal BREEAM assessment won't be carried out. These will mainly include:

MATERIALS

Environmental impact of construction materials will be taken into account. Where possible, construction materials will be sourced from local producers and suppliers with environmental impact certification. All timber will be FSC (or equivalent) certified.

ENERGY

Besides the energy efficiency measures relating to regulated energy, which are described in the energy statement, there will be additional energy saving measures implemented in the development:

- Energy efficient white goods and other electrical equipment will be used

- Low energy external lighting

WASTE

Adequate internal and external storage of recycled and non-recycled waste will be ensured. The external storage will be sized according to the frequency of collection, based on guidance from the recycling scheme operator.

Construction waste will be minimised by implementing a site waste management plan containing procedures to minimise and divert waste from landfill

The 2021 London Plan approach of "Be lean" – "Be clean" – "Be green" is fully adopted by implementing:

- Passive measures (low U-values and air permeability) High efficiency services, i.e. low energy lights, high efficiency ventilation with heat recovery, waste water heat recovery
- Renewable sources: Air source heat pumps, Photovoltaic system with a peak output of 24 kWp,

Excluded renewable sources are:

- Solar hot water
- Biomass
- Wind turbines

The proposed development will achieve:

- 37% regulated CO2 reduction against 2021 Part L compliant baseline

- 16% regulated CO2 reduction by efficiency measures (Be Lean)

- 41% regulated CO2 reduction by renewable sources

- £63,312 will be paid to the carbon offset fund

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Be Lean

As designed

Date: Tue Sep 06 15:16:56 2022

Administrative information

Building Details

Address: 44-46 Hampstead Lane, London, N6 4LL

Certifier details

Name: Ondrej Gajdos

Telephone number: 02080995978

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.c.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.1.2

BRUKL compliance module version: v6.1.c.0

Foundation area [m²]: 731.89

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	8.02	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	6.66	
Target primary energy rate (TPER), $kWh/m^2.annum$	87.21	
Building primary energy rate (BPER), $kWh/m^2.annum$	72.37	
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	$U_{a\text{-Limit}}$	$U_{a\text{-Calc}}$	$U_{i\text{-Calc}}$	First surface with maximum value
Walls*	0.26	0.16	0.16	0LG - studios1_W_30
Floors	0.18	0.12	0.13	0LG - cinema_F_8
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.13	0.13	0LG - cinema_R_17
Windows** and roof windows	1.6	1.2	1.3	1st - circ1_G_56
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.5	1.5	00Basement - circ_D_49
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-Limit}}$ = Limiting area-weighted average U-values [W/(m²K)]

$U_{i\text{-Calc}}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-Calc}}$ = 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- Heating&cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	4.92	-	-	-
Standard value	2.5*	5	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.

2- Heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	-	-	-
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- Project DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.86	0.01
Standard value	2*	N/A

* Standard shown is for all types except absorption and gas engine heat pumps.

Zone-level mechanical ventilation, exhaust, and terminal units

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

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

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
0LG - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios5	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - ofc	-	-	-	-	0.5	-	-	-	-	0.8	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
0UG - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - cafe	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios5	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios6	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios7	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - quiet	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
00Basement - laundry	0.3	-	-	-	-	-	-	-	-	-	N/A
00Basement - kit	-	-	-	-	-	-	-	-	0.6	-	N/A
00Basement - staff	-	-	-	-	0.5	-	-	-	-	0.8	N/A
00Basement - wc	0.3	-	-	-	-	-	-	-	-	-	N/A
00Basement - shwr	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - circ2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - wc2	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - treat	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - rec	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - din	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - wc2	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - wc3	0.3	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
1st - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - din	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - sluice	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - shower	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndB - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndA - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - sluice	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndA - wc1	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
0LG - studios1	110	-	-
0LG - cinema	110	-	-
0LG - din-lounge	110	-	-
0LG - studios2	110	-	-
0LG - studios3	110	-	-
0UG - studios5	110	-	-
0UG - studios1	110	-	-
0UG - ofc	110	-	-
0UG - studios3	110	-	-
0UG - lounge	110	-	-
0UG - studios4	110	-	-
0UG - nurse	110	-	-
0UG - cafe	110	-	-
0UG - studios2	110	-	-
1st - studios1	110	-	-
1st - studios5	110	-	-
1st - studios6	110	-	-
1st - studios7	110	-	-
1st - lounge	110	-	-
1st - quiet	110	-	-
1st - studios3	110	-	-
1st - studios4	110	-	-
1st - din-lounge	110	-	-
1st - studios2	110	-	-
2ndB - nurse	110	-	-
2ndB - studios1	110	-	-
2ndB - din-lounge	110	-	-

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
2ndB - studios2	110	-	-
2ndB - studios4	110	-	-
2ndB - studios3	110	-	-
2ndA - studios1	110	-	-
2ndA - din-lounge	110	-	-
2ndA - studios2	110	-	-
00Basement - laundry	110	-	-
00Basement - plant	110	-	-
00Basement - kit	110	-	-
00Basement - circ	110	-	-
00Basement - st1	110	-	-
00Basement - staff	110	-	-
00Basement - wc	110	-	-
00Basement - st2	110	-	-
00Basement - shwr	110	-	-
00Basement - st3	110	-	-
0LG - quiet	110	-	-
0LG - st7	110	-	-
0LG - drugs	110	-	-
0LG - plant	110	-	-
0LG - circ1	110	-	-
0LG - nurse	110	-	-
0LG - circ2	110	-	-
0LG - wc1	110	-	-
0LG - st2	110	-	-
0LG - st3	110	-	-
0LG - st1	110	-	-
0LG - bath1	110	-	-
0LG - st4	110	-	-
0LG - st5	110	-	-
0LG - wc2	110	-	-
0LG - st6	110	-	-
0UG - treat	110	-	-
0UG - circ1	110	-	-
0UG - st1	110	-	-
0UG - rec	110	50	2.7
0UG - wc1	110	-	-
0UG - din	110	-	-
0UG - bath1	110	-	-
0UG - drugs	110	-	-
0UG - wc2	110	-	-
0UG - st2	110	-	-
0UG - st3	110	-	-

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
0UG - st4	110	-	-
0UG - wc3	110	-	-
1st - circ1	110	-	-
1st - wc1	110	-	-
1st - din	110	-	-
1st - sluice	110	-	-
1st - nurse	110	-	-
1st - bath1	110	-	-
1st - shower	110	-	-
1st - drugs	110	-	-
1st - st1	110	-	-
1st - st2	110	-	-
1st - st3	110	-	-
2ndB - st1	110	-	-
2ndB - circ1	110	-	-
2ndB - st2	110	-	-
2ndB - drugs	110	-	-
2ndA - bath1	110	-	-
2ndA - circ1	110	-	-
2ndA - sluice	110	-	-
2ndA - st1	110	-	-
2ndA - st2	110	-	-
2ndA - wc1	110	-	-

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?
0LG - studios1	NO (-16.4%)	NO
0LG - cinema	N/A	N/A
0LG - din-lounge	NO (-5.3%)	NO
0LG - studios2	NO (-47.6%)	NO
0LG - studios3	NO (-44.8%)	NO
0UG - studios5	NO (-29.1%)	NO
0UG - studios1	NO (-45.4%)	NO
0UG - ofc	NO (-52.1%)	NO
0UG - studios3	NO (-46.7%)	NO
0UG - lounge	NO (-2.5%)	NO
0UG - studios4	NO (-40.8%)	NO
0UG - nurse	N/A	N/A
0UG - cafe	NO (-60.5%)	NO
0UG - studios2	NO (-87%)	NO
1st - studios1	NO (-52.7%)	NO
1st - studios5	NO (-57.8%)	NO
1st - studios6	NO (-61.5%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1st - studios7	NO (-63.4%)	NO
1st - lounge	NO (-50.6%)	NO
1st - quiet	NO (-19.4%)	NO
1st - studios3	NO (-74%)	NO
1st - studios4	NO (-70.4%)	NO
1st - din-lounge	NO (-33.3%)	NO
1st - studios2	NO (-81.1%)	NO
2ndB - nurse	NO (-63.6%)	NO
2ndB - studios1	NO (-83.6%)	NO
2ndB - din-lounge	NO (-64.9%)	NO
2ndB - studios2	NO (-85.7%)	NO
2ndB - studios4	NO (-77.1%)	NO
2ndB - studios3	NO (-68.4%)	NO
2ndA - studios1	NO (-80.1%)	NO
2ndA - din-lounge	NO (-69.9%)	NO
2ndA - studios2	NO (-78.8%)	NO
00Basement - staff	N/A	N/A
0LG - quiet	N/A	N/A
0LG - nurse	N/A	N/A
0UG - treat	NO (-32.5%)	NO
0UG - rec	N/A	N/A
0UG - din	NO (-32.9%)	NO
1st - din	NO (-38.5%)	NO
1st - nurse	NO (-66%)	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?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	4391.4	4391.4
External area [m²]	4686.6	4686.6
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	1271.05	1700.03
Average U-value [W/m²K]	0.27	0.36
Alpha value* [%]	87.27	52.66

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	4.22	4.74
Cooling	7.52	7.69
Auxiliary	7.81	10.02
Lighting	7.14	7.24
Hot water	22.29	29.34
Equipment*	36.16	36.16
TOTAL**	**48.98**	**59.03**

* 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
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	245.14	212.15
Primary energy [kWh/m²]	72.37	87.21
Total emissions [kg/m²]	6.66	8.02

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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	44.4	176.9	4.8	13.4	5.9	2.59	3.68	2.64	4.92
	Notional	53.5	132.8	5.6	13.7	8.9	2.64	2.7	----	----
[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Natural Gas										
	Actual	31.5	244.4	3.5	0	10	2.48	0	2.64	0
	Notional	34.2	211.1	3.6	0	10.7	2.64	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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Be Green

As designed

Date: Tue Sep 06 16:01:01 2022

Administrative information

Building Details

Address: 44-46 Hampstead Lane, London, N6 4LL

Certifier details

Name: Ondrej Gajdos

Telephone number: 02080995978

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.c.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.1.2

BRUKL compliance module version: v6.1.c.0

Foundation area [m²]: 731.89

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	8.02	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	5.06	
Target primary energy rate (TPER), $kWh/m^2.annum$	87.21	
Building primary energy rate (BPER), $kWh/m^2.annum$	54.73	
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	$U_{a\text{-Limit}}$	$U_{a\text{-Calc}}$	$U_{i\text{-Calc}}$	First surface with maximum value
Walls*	0.26	0.16	0.16	0LG - studios1_W_30
Floors	0.18	0.12	0.13	0LG - cinema_F_8
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.13	0.13	0LG - cinema_R_17
Windows** and roof windows	1.6	1.2	1.3	1st - circ1_G_56
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.5	1.5	00Basement - circ_D_49
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-Limit}}$ = Limiting area-weighted average U-values [W/(m²K)]

$U_{a\text{-Calc}}$ = Calculated area-weighted average U-values [W/(m²K)]

$U_{i\text{-Calc}}$ = Calculated maximum individual element 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- Heating&cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.99	4.92	-	-	-
Standard value	2.5*	5	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.

2- Heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.99	-	-	-	-
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- Project DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	3.99	0.01
Standard value	2*	N/A

* Standard shown is for all types except absorption and gas engine heat pumps.

Zone-level mechanical ventilation, exhaust, and terminal units

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

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

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
0LG - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios5	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - ofc	-	-	-	-	0.5	-	-	-	-	0.8	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
0UG - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - cafe	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios5	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios6	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios7	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - quiet	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
00Basement - laundry	0.3	-	-	-	-	-	-	-	-	-	N/A
00Basement - kit	-	-	-	-	-	-	-	-	0.6	-	N/A
00Basement - staff	-	-	-	-	0.5	-	-	-	-	0.8	N/A
00Basement - wc	0.3	-	-	-	-	-	-	-	-	-	N/A
00Basement - shwr	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - circ2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - wc2	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - treat	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - rec	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - din	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - wc2	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - wc3	0.3	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
1st - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - din	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - sluice	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - shower	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndB - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndA - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - sluice	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndA - wc1	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
0LG - studios1	110	-	-
0LG - cinema	110	-	-
0LG - din-lounge	110	-	-
0LG - studios2	110	-	-
0LG - studios3	110	-	-
0UG - studios5	110	-	-
0UG - studios1	110	-	-
0UG - ofc	110	-	-
0UG - studios3	110	-	-
0UG - lounge	110	-	-
0UG - studios4	110	-	-
0UG - nurse	110	-	-
0UG - cafe	110	-	-
0UG - studios2	110	-	-
1st - studios1	110	-	-
1st - studios5	110	-	-
1st - studios6	110	-	-
1st - studios7	110	-	-
1st - lounge	110	-	-
1st - quiet	110	-	-
1st - studios3	110	-	-
1st - studios4	110	-	-
1st - din-lounge	110	-	-
1st - studios2	110	-	-
2ndB - nurse	110	-	-
2ndB - studios1	110	-	-
2ndB - din-lounge	110	-	-

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
2ndB - studios2	110	-	-
2ndB - studios4	110	-	-
2ndB - studios3	110	-	-
2ndA - studios1	110	-	-
2ndA - din-lounge	110	-	-
2ndA - studios2	110	-	-
00Basement - laundry	110	-	-
00Basement - plant	110	-	-
00Basement - kit	110	-	-
00Basement - circ	110	-	-
00Basement - st1	110	-	-
00Basement - staff	110	-	-
00Basement - wc	110	-	-
00Basement - st2	110	-	-
00Basement - shwr	110	-	-
00Basement - st3	110	-	-
0LG - quiet	110	-	-
0LG - st7	110	-	-
0LG - drugs	110	-	-
0LG - plant	110	-	-
0LG - circ1	110	-	-
0LG - nurse	110	-	-
0LG - circ2	110	-	-
0LG - wc1	110	-	-
0LG - st2	110	-	-
0LG - st3	110	-	-
0LG - st1	110	-	-
0LG - bath1	110	-	-
0LG - st4	110	-	-
0LG - st5	110	-	-
0LG - wc2	110	-	-
0LG - st6	110	-	-
0UG - treat	110	-	-
0UG - circ1	110	-	-
0UG - st1	110	-	-
0UG - rec	110	50	2.7
0UG - wc1	110	-	-
0UG - din	110	-	-
0UG - bath1	110	-	-
0UG - drugs	110	-	-
0UG - wc2	110	-	-
0UG - st2	110	-	-
0UG - st3	110	-	-

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
0UG - st4	110	-	-
0UG - wc3	110	-	-
1st - circ1	110	-	-
1st - wc1	110	-	-
1st - din	110	-	-
1st - sluice	110	-	-
1st - nurse	110	-	-
1st - bath1	110	-	-
1st - shower	110	-	-
1st - drugs	110	-	-
1st - st1	110	-	-
1st - st2	110	-	-
1st - st3	110	-	-
2ndB - st1	110	-	-
2ndB - circ1	110	-	-
2ndB - st2	110	-	-
2ndB - drugs	110	-	-
2ndA - bath1	110	-	-
2ndA - circ1	110	-	-
2ndA - sluice	110	-	-
2ndA - st1	110	-	-
2ndA - st2	110	-	-
2ndA - wc1	110	-	-

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?
0LG - studios1	NO (-16.4%)	NO
0LG - cinema	N/A	N/A
0LG - din-lounge	NO (-5.3%)	NO
0LG - studios2	NO (-47.6%)	NO
0LG - studios3	NO (-44.8%)	NO
0UG - studios5	NO (-29.1%)	NO
0UG - studios1	NO (-45.4%)	NO
0UG - ofc	NO (-52.1%)	NO
0UG - studios3	NO (-46.7%)	NO
0UG - lounge	NO (-2.5%)	NO
0UG - studios4	NO (-40.8%)	NO
0UG - nurse	N/A	N/A
0UG - cafe	NO (-60.5%)	NO
0UG - studios2	NO (-87%)	NO
1st - studios1	NO (-52.7%)	NO
1st - studios5	NO (-57.8%)	NO
1st - studios6	NO (-61.5%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1st - studios7	NO (-63.4%)	NO
1st - lounge	NO (-50.6%)	NO
1st - quiet	NO (-19.4%)	NO
1st - studios3	NO (-74%)	NO
1st - studios4	NO (-70.4%)	NO
1st - din-lounge	NO (-33.3%)	NO
1st - studios2	NO (-81.1%)	NO
2ndB - nurse	NO (-63.6%)	NO
2ndB - studios1	NO (-83.6%)	NO
2ndB - din-lounge	NO (-64.9%)	NO
2ndB - studios2	NO (-85.7%)	NO
2ndB - studios4	NO (-77.1%)	NO
2ndB - studios3	NO (-68.4%)	NO
2ndA - studios1	NO (-80.1%)	NO
2ndA - din-lounge	NO (-69.9%)	NO
2ndA - studios2	NO (-78.8%)	NO
00Basement - staff	N/A	N/A
0LG - quiet	N/A	N/A
0LG - nurse	N/A	N/A
0UG - treat	NO (-32.5%)	NO
0UG - rec	N/A	N/A
0UG - din	NO (-32.9%)	NO
1st - din	NO (-38.5%)	NO
1st - nurse	NO (-66%)	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?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	4391.4	4391.4
External area [m²]	4686.6	4686.6
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	1271.05	1700.03
Average U-value [W/m²K]	0.27	0.36
Alpha value* [%]	87.27	52.66

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	2.79	4.74
Cooling	7.52	7.69
Auxiliary	7.81	10.02
Lighting	7.14	7.24
Hot water	15.98	29.34
Equipment*	36.16	36.16
TOTAL**	**41.24**	**59.03**

* 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	4.2	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*4.2*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	245.14	212.15
Primary energy [kWh/m²]	54.73	87.21
Total emissions [kg/m²]	5.06	8.02

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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	44.4	176.9	3.2	13.4	5.9	3.91	3.68	3.99	4.92
	Notional	53.5	132.8	5.6	13.7	8.9	2.64	2.7	----	----
[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Natural Gas										
	Actual	31.5	244.4	2.3	0	10	3.75	0	3.99	0
	Notional	34.2	211.1	3.6	0	10.7	2.64	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

Energy Performance Certificate

Non-Domestic Building

HM Government

44-46 Hampstead Lane
London
N6 4LL

Certificate Reference Number:
7200-5526-2159-6813-0813

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO_2 emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

6 **This is how energy efficient the building is.**

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Mixed-mode with Mechanical Ventilation
Total useful floor area (m^2):	4391.4
Building complexity:	Level 4
Building emission rate ($kgCO_2/m^2$ per year):	5.06
Primary energy use (kWh/m^2 per year):	54.73

Benchmarks

Buildings similar to this one could have ratings as follows:

9 If newly built

37 If typical of the existing stock

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Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	DesignBuilder SBEM v7.1.2 using calculation engine SBEM v6.1.c.0
Property Reference:	
Assessor Name:	Ondrej Gajdos
Assessor Number:	LCEA099330
Accreditation Scheme:	CIBSE Certification Limited
Assessor Qualifications:	NOS4
Employer/Trading Name:	
Employer/Trading Address:	
Issue Date:	06 Sep 2022
Valid Until:	05 Sep 2032 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 1308-0702-7206-3195-9304

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by CIBSE Certification Limited. You can obtain contact details of the Accreditation Scheme at www.cibsecertification.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

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