

26 Sheldon Road Haringey Council Energy Statement

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Issue Status

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Revision Number	Issue Date:	Issue by:
Revision 1	01.09.2022	Ross Standaloft

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Executive Summary

INTRODUCTION

The proposed residential scheme at “26 Sheldon Road” is required to make carbon emission reductions in accordance with the Haringey council policy DM21 and the London Plan 2021’s policy SI 2 ‘Minimising Greenhouse Gas Emissions’ – using the energy hierarchy and target of 35% beyond building regulations as a minimum on site - with a local policy target overall of 100% CO2 reduction - or zero carbon.

AIM OF THIS STUDY

The aim of this study is to assess the feasible carbon emission reductions through building fabric, efficient services and low or zero carbon technologies to meet Haringey Council target of zero carbon (100% reduction over Part L). With 35% carbon reduction on-site target as per London Plan, with at least 10% coming from fabric and energy efficiency measures first before renewables are assessed. The remainder of carbon emissions then need to be offset using the council’s hierarchy of carbon charges to encourage extremely low carbon development. This report demonstrates how the site has followed the London Plan’s energy hierarchy by reducing energy demand through passive design, energy efficiency measures, i.e. ‘Be Lean’ and generating renewable energy to further reduce the overall carbon emissions of the development i.e. ‘Be Green’ and then offsetting.

METHODOLOGY

The methodology followed in this report follows the guidance set out by the Greater London Authority (GLA) for developing energy strategies as detailed on the following “GLA Energy Team Guidance on Planning Energy Assessments”, 2021.

Energy consumption figures are based on SAP modelling data produced under Building Regulations Part L compliant software (SAP 10). Analysis of the house has been undertaken to demonstrate compliance with the Building Regulations Part L. The baseline scenario in this study is the proposed to notional Part L standards, or the Target Emission Rate (TER)

SITE DESCRIPTION

The proposed scheme is a new build house, with the existing house being demolished.

The house is oriented primarily North-West from the front facade. The scheme is of traditional design and in-keeping with the local area.

RECOMMENDATION

The energy strategy for the proposed scheme is to use a highly efficient Air Source Heat Pump (ASHP) as main heating and DHW system, alongside advanced energy efficiency fabric measures to meet the carbon emissions reductions target.

The proposal is to use advanced fabric efficiency standards, surpassing Part L requirements. The thermal performance targets of the dwelling are the following: U-Values of 0.10 W/m²K for the ground floor, 0.11 W/m²K for the roof, 0.15 W/m²K for walls and high-performance triple-glazed windows of 0.95 W/m². A maximum air permeability of 3 m³/m²/hr at 50 pa is targeted, and to be achieved on site. Thermal bridging will also be kept to a minimum, with an average Y-value of 0.06, following LABC details, thus going beyond accredited construction details as a minimum.

In addition, MVHR ventilation will keep the house well ventilated and surpass Part F requirements.

CO₂ SAVINGS SUMMARY

The baseline carbon emissions for the scheme are **5,602 kgCO₂/yr**. Following implementation of measures within this report; a total saving of **4,051 kgCO₂/yr** will be made, a **72.3%** overall carbon reduction before offsetting the remainder. These measures include:

- **Be Lean** (16.2% savings over baseline): Energy efficiency measures to improve the building fabric and services: Very high-performance U-Values (0.15 for walls, 0.11 for roof, 0.10 for the ground floor and 0.95 for windows in W/m²K), best practice air tightness (maximum of 3 m³/m²/hr at 50 Pa), MVHR and best practice attention to thermal bridging at an average Y-value of 0.06.

- **Be Clean** (0% savings over Lean case); No further savings through the use of heat networks are planned.

- **Be Green** (56.1% savings over clean case): Low carbon heating and hot water through ASHP for clean heating and hot water for the scheme.

- **Offset** (27.7% savings): A payment of **£13,959** is required to pay Haringey council to be 100% zero carbon, as per their offset scheme.

The figures are summarized and represented in graphical form on the following page.

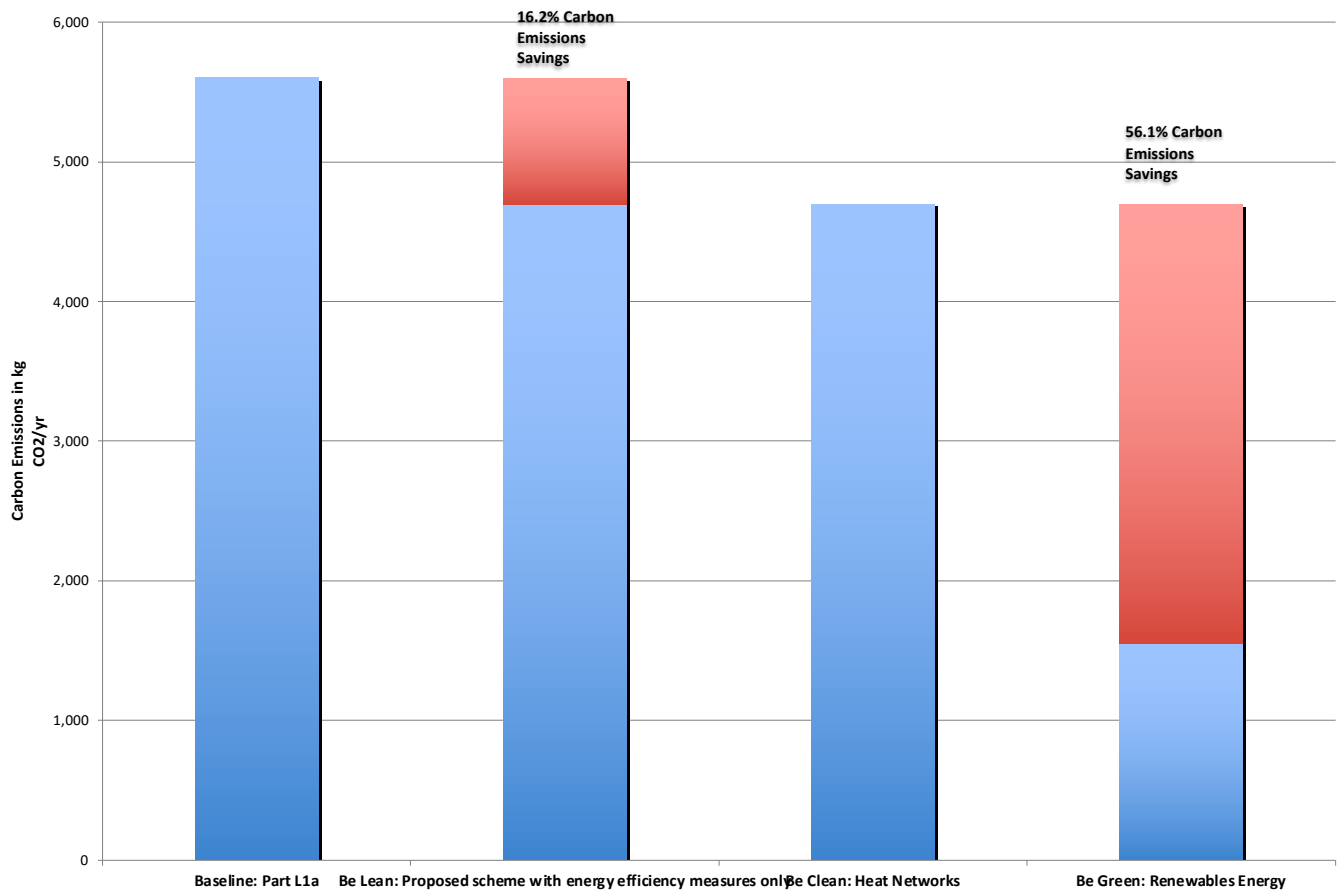
Part L

The scheme meets Building Regulations Part L and subsequent revisions.

GLA's Energy Hierarchy

	Baseline	Be Lean: Energy Efficiency Measures	Be Clean: Heat Networks	Be Green: Renewable
Carbon emissions in kgCO ₂ /yr	5,602	4,695	-	1,551
Carbon emission savings in kgCO ₂ /yr	-	907	-	3,144
Percentage reduction in carbon emissions over the previous stage	-	16.2%	0%	56.1%

Energy Hierarchy



Planning Requirements

PLANNING REQUIREMENT

The latest London Plan 2021, Policy SI 2 'Greenhouse Gas Emissions' requires developments to achieve 35% minimum carbon reduction on site through fabric efficiency and implementations of renewables.

The 2021 London Plan also requires a 10% reduction through fabric and energy efficiency enhancements only, and then a further 25% minimum carbon reduction through the use of local heat networks 'Be Clean' or on-site renewable energy technologies 'Be Green'.

Haringey Local Policy DM21, Local Plan SP4 and the July 2021 submission validation checklist note that the requirement is zero carbon developments, or 100% CO₂ savings over Part L – achieved through the London Plan energy hierarchy and achieved on-site where possible, with remaining emissions offset under the boroughs offset payment scheme.

REQUIREMENTS FOR AN ENERGY STATEMENT

The Greater London Authority defines in the London Plan Supplementary Planning Guidance that applications for major developments should be accompanied by an energy statement, which provides information as set out below:

- Calculation of baseline energy demand and carbon dioxide emissions showing the contribution of emissions from building regulations
- Proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services;
- Proposals to further reduce carbon dioxide emissions through the use of decentralized energy where feasible, such as district heating and cooling;
- Proposals to further reduce carbon dioxide emissions through the use of on-site low or zero carbon technologies, and;
- The development should propose to Offset the remaining emissions to reduce the site to Zero Carbon.
- In addition, major developments (over 1000m²) should report their building performance to the GLA.

An assessment of the feasibility of different renewable technologies on the site and the potential contribution to CO₂ reduction from each option, explaining which technologies have been investigated and why any technologies have been ruled out.

We will also assess the likelihood of overheating in the project and measures to reduce, where necessary.

Methodology

METHODOLOGY

The methodology followed in this report follows the guidance set out in GLA Energy Team Guidance on Planning Energy Assessments, 2020, as set out below.

Energy consumption figures are based on SAP modeling data produced under Building Regulations Part L compliant software (SAP 10) – including new emissions figures under Part L 2021 update (enforced from 15th June 2022)

The analysis of the house has been undertaken to show the compliance with the Building Regulations Part L1a 2013.

LONDON PLAN ENERGY HIERARCHY

Taken from GLA Energy Assessment Guidance , 2020

The London Plan's energy hierarchy takes a 'whole energy' approach and addresses energy efficiency use, energy supply efficiency and use of low or zero carbon technologies. The purpose is to demonstrate that climate change mitigation measures are integral to the scheme's design and evolution, and that they are appropriate to the context of the development. The below summarises the guidance for each stage.

BASELINE CALCULATIONS

See overleaf for the details of the baseline calculations in line with the Part L SAP Target Emissions Rate (TER).

BE LEAN

Demand reduction (Be Lean) measures specific to the scheme are encouraged at the earliest design stage of a development and aim to reduce to demand for energy. Measures typically include passive design: both architectural and building fabric measures, active design and energy efficient services. Building Regulations (Part L) should be exceeded by 10% through demand reduction (Be Lean) measures alone.

BE CLEAN

A 'clean' energy supply refers to utilising the energy efficiency of heating infrastructure networks. Planning applications should demonstrate how the their energy systems will exploit local energy resources and secondary heat to minimize CO₂ emissions in accordance with the order of preference in Policy SI 3 – Heating Infrastructure, using the Heat Network Priority Areas (HNPA).

BE GREEN

Use of Low Zero Carbon technologies in developments is encouraged at the 'Be Green' third stage. Each low or zero carbon technologies in the London Plan should be deemed to be technically feasible or not.

OFFSET

After carbon emissions are reduced through 'Be Lean, Be Clean and Be Green' – the residual carbon emissions on site are to be calculated and offset through the Haringey borough's Offset scheme at a recommended cost of £1000/tonne/year for a 0-60% carbon reduction, £300/tonne/year for a 60-80% carbon reduction and £100/tonne/year for a 80-100% reduction

BE SEEN

For larger, major developments, a final step of 'Be Seen' is required – which asks for monitoring and data to be done at planning stage, development stage and by the owner – data is uploaded to a portal to check KPI's and feedback to the GLA.

“Be Lean” Energy Efficiency measures

ENERGY EFFICIENCY TARGETS

Energy efficiency measures for the building fabric will be incorporated to reduce the energy demand and carbon footprint of the proposed scheme. The below measures reach the minimum 10% carbon saving from this step of the London Plan.

In order to surpass the target and use best practice principals to work, all u-values have been pushed far beyond Part L minimum standards.

U-VALUES TARGETED ACROSS SITE

Element	Building Regulations Part L max U-Value (W/m ² K)	Proposed U-Value (W/m ² K)
Roof	0.16	0.11
Floor	3	0.10
Walls	0.26	0.15
Window	1.6	0.95

AIR-TIGHTNESS

In addition to excellent u-values, a high-performance development is proposed with excellent air tightness levels is to be achieved such that the proposed scheme does not exceed an air permeability level of 3 m³/hr/m² at 50pa during testing.

This will be achieved through ensuring that sensitive areas are accounted for in the design and construction phases to make certain that a tightly sealed building is constructed and all punctures through the seal are airtight. In particular, attention will be paid to openings such as services and down lighters at roof level. Calculated PSI details will be followed to ensure that the average Y-Value across site will be no greater than 0.06. Each thermal bridge will be required to be calculated and shown that the 0.06 overall values are met.

ENERGY EFFICIENCY

In this scenario, a highly efficient gas boiler (SEDBUK 90%) is specified, with interlock and weather compensator included. Heating will be delivered via efficient under floor heating and radiator mix.

In addition, 100% of internal lighting will be energy efficient.

VENTILATION

Full mechanical ventilation with heat recovery, the Ectaire Maxi Plus BY – ceiling-mounted MVHR, will be implemented in the house and to meet the full requirements of Part F.

“Be Clean” Use of heat networks

USE OF DECENTRALIZED POWER & HEAT NETWORKS



Inline with London Plan Policy SI 3, Heat Infrastructure, major development should aim to use waste heat or secondary heat, exploit existing heat / cooling networks where possible or future proof utility infrastructure to minimize the impact from roadworks.

There are various heating networks already established in London and the mayor has identified Heat Network Priority areas (HNPA) – these will be assessed to determine if the site should be considered, alongside combined heat and power (CHP) on site also:

Connection to existing CCHP/CHP/Heat networks

This option is deemed infeasible in this instance due to the lack of an existing CCHP/CHP/Heat networks in the vicinity of the proposed development.

Site wide CCHP/CHP/Heat generation powered by renewables

CCHP/CHP/Heat generation powered through renewables such as biomass is considered infeasible in this instance due to issues relating to air quality. The site is not communal and too small for this.

Heat Network Priority Area (HNPA)

The site sits outside of the HNPA.

FRAMEWORK TO ANALYSE MICRO CHP ON SITE

A micro CHP on site has been analysed along the following points:

- The technical feasibility of CHP on a site-wide basis and for portions of the scheme.
- The viability of the CHP in terms of capital expenditure per unit.
- The carbon emissions reductions from the CHP as compared to an alternative system.

CHP ANALYSIS

Combined heat and power (CHP) has been assessed in terms of feasibility. It is considered that CHP unit is inappropriate for this development, as there is not a sufficient heat load and DHW requirements. This is primarily due to the fabric first approach to energy saving, pushing the heating demand down.

“Be Green” renewable energy target

INTRODUCTION

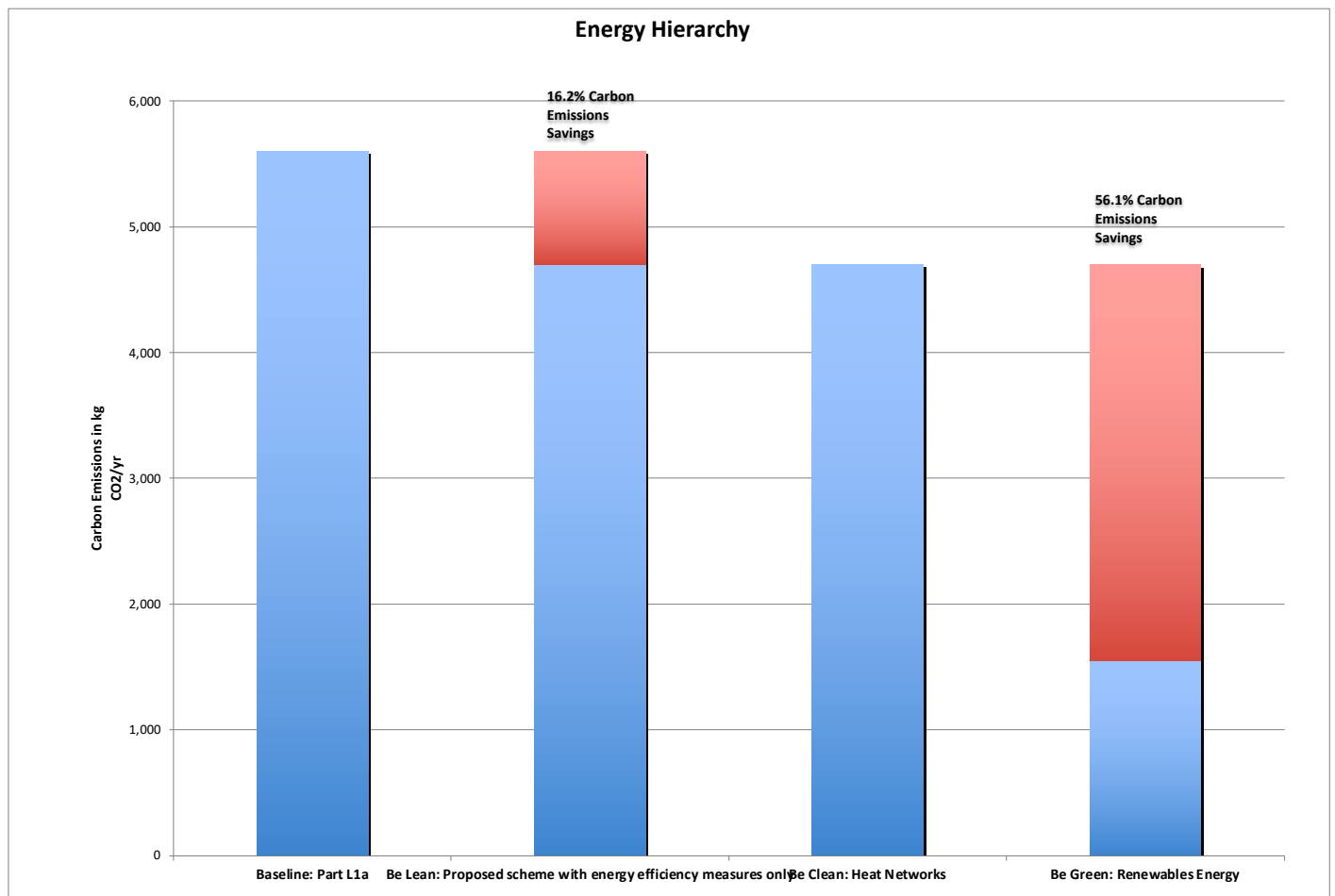
The predicted carbon emissions of the proposed scheme following energy efficiency measures and fabric values will be 4,695 kgCO₂/yr or 16.2% in line with the methodology and details provided in this report, in addition to local policy.

In addition, a further CO₂ emissions reduction is required to meet 100% Carbon Emission savings and 35% on-site minimum savings on-site. This is through the use of on-site renewable technologies. Air Source Heat Pump (ASHP) has been identified as the ideal renewable energy sources for the following reasons:

- ASHP operate like regular boilers for the end user, but are 250-400% efficient.
- ASHP is the most financially viable options
- As the grid green ASHP will be carbon neutral

RENEWABLES & OVERALL EMISSIONS REDUCTION

The renewable solutions will give a 3,144 kg/CO₂/yr saving, which gives a total project saving of 4,051 kg/CO₂/yr or **72.3%** carbon saving over baseline building regulations overall.



Feasible Renewable Energy technologies

FEASIBLE LOW OR ZERO CARBON TECHNOLOGIES

A reduction in carbon emissions through the use of on-site low or zero carbon technologies can be achieved through several technologies to generate either heat or power. Following the analysis of the carbon emissions related to the scheme, the objective of this section is to determine the feasible low or zero carbon technologies options that provide cost-effective and practical emissions reductions. The low or zero carbon technologies options for the proposed scheme are provided in the table below. Each technology is also assessed as either feasible or rejected based on its implications for the scheme in terms of their implementation, cost-effectiveness, site-related constraints, planning issues or others. The following sections will explore the feasible technologies in depth and explain why certain technologies have been rejected.

Technology and feasibility	Rationale
BIOMASS / REJECTED	Biomass would be able to provide a 35% overall reduction in carbon emissions. However, this technology would have a significant impact on local air quality in the Borough and development access restraints preclude the possibility of biomass pellet delivery.
LIQUID BIOFUEL/ REJECTED	Although biofuel has the capability to heat the house, as with solid biomass, liquid biofuel has air quality implications in addition to delivery and sourcing issues in a city location such as this.
AIR SOURCE HEAT PUMP (ASHP) / ACCEPTED	An air source heat pump can supply heating and hot water to the proposed scheme. There is space in the plant room to house the cylinder required for the Air Source Heat Pump (ASHP) and suitable space outdoors for the external unit also. The high efficiency and electrical source of ASHP makes this a great choice to lower carbon emissions now and further in the future.
GROUND SOURCE HEAT PUMP / FEASIBLE – NOT ACCEPTED	A ground source heat pump would be capable of heating the house and providing hot water with slightly better efficiency than ASHP; however capital cost unknowns and land type for drilling boreholes make this technology require more investigation at detailed design to implement on the site.
PHOTOVOLTAIC (PV) / FEASIBLE – NOT ACCEPTED	There is minimal roof area available for PV. This could potentially surpass the 80% renewable target for better offset fees, however the capital cost and aesthetic impact is not desirable. The council offset fund contribution would be used for more suitable offset projects.
SOLAR HOT WATER (SHW) / FEASIBLE – NOT ACCEPTED	As with Solar PV, Roof mounted SHW units could be located on the roof space area. If the roof space available were covered with solar collectors as appose to Solar PV, the carbon savings would be far less.
WIND TURBINE / REJECTED	Turbulence created from surrounding buildings makes this an inefficient solution and it would make a large visible impact.

“Be Green” renewable energy target

INTRODUCTION

It is proposed that in order to meet the London Plan requirements on production of clean ‘Green’ energy and the local Haringey policy towards zero carbon, an Air Source Heat Pump (ASHP) is deemed the feasible and viable solution.

AIR SOURCE HEAT PUMPS

An air source heat pump (ASHP) absorbs heat from outside a building and release it inside using the vapor-compression refrigeration process, in the opposite direction. The heat usually goes to a buffer tank before radiators or UFH distribution. ASHP’s are around 250-400% efficient (meaning 2.5-4KW of power for every 1KW put in) and are best suited to modern, well insulated properties.

POTENTIAL SPECIFICATION



A suggested specification for the Air Source Heat Pump (ASHP) would consist of a Samsung DVM S Eco air-to-water heat pump and underfloor heating distribution throughout the house. Dutypoint 500 Litre cylinder will be specified for consistent hot water and storage.

In Addition, Re-coup Shower Waste Heat

Recovery units (SWWHR) will be installed to save waste heat otherwise lost from showers.

DISCLAIMER

Note that ASHP installation require full design and installation from the electric sub-contractor and/or a renewables installer.

Overheating Analysis

INTRODUCTION

Climate change and the heat-island effect is making overheating a much larger problem in London in recent years and a potential huge problem in decades to come. Under London Plan policy SI 2 'Minimising greenhouse gas emissions' & SI 4 'Managing Heat Risk', it is noted that the GHA overheating risk tool and the 'overheating hierarchy' should be followed in design to reduce unneeded overheating.

ANALYSIS

Overheating Hierarchy:

The below measures have been taken into account in the design:

- 1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
 - The property is has excellent u-values that help keep heat out. The more south facing façades will have glazing with a low 0.4 G-value to limit the amount of heat radiation.
- 2) minimise internal heat generation through energy efficient design
 - The property has external shading and overhangs
- 3) manage the heat within the building through exposed internal thermal mass and high ceilings
 - Thermal mass to rear floors with solar gains
- 4) provide passive ventilation
 - Openable windows and extract throughout.
- 5) provide mechanical ventilation
 - Full mechanical ventilation with heat recovery specified
- 6) provide active cooling systems.
 - There will be key active cooling to some rooms on site.

The outline overheating assessment determines the site is at MED risk from overheating and all rooms will pass CIBSE criteria.

Water Requirement

INTRODUCTION

In excess of 20% of the UK's water is used domestically with over 50% of this used for flushing WCs and washing (source: Environment Agency). The majority of this comes from drinking quality standard or potable water.

The water efficiency measures included in the house will ensure that the water use target of Part G 125 litres per person AND the recommended level of 110 litres per person per day will be achieved using the measures described below.

RECOMMENDATION

The following water fittings will be provided for all dwellings:

- 6/3 litre dual flush WC 's
- Kitchen taps flow aerated taps with flow rate of 5 litres
- Flow aerated taps with flow rate of 3.5 litres
- Showers are average max flow rate mix of max. 6 and 9 litres/minute at supplied pressure.
- Bath 200 litres max
- A/A+ rated washing machines (5kg per litre) and dishwashers (0.68 litre / place).

The above specification will equate to less approx. 103.2 litres per person per day.

Carbon Emission Offset

INTRODUCTION

Haringey Borough Energy Policy notes that 100% of carbon emissions should be mitigated for all new developments – major or minor, first through on-site fabric improvements, on-site renewables and finally remaining emissions offset through the council offset scheme.

There are 3 levels to the offset scheme, with the cost dependent upon the on-site savings achieved. The price is calculated over 30 years – with 1 tonne of CO₂ per year (tCO₂/y) is priced as follows:

On-site CO ₂ reduction	Offset cost (tCO ₂ /y)
0 – 60%	£1000
60 – 80%	£300
80 - 100%	£100

Example: a site with 50% CO₂ reduction, passing London Plan and an average of 1 tonne/year remaining to offset. would be required to pay £1000 x 30 = £30,000 offset payment.

OFFSET COST

The 26 Sheldon Road on-site carbon reductions total 72.3%, therefore the tariff is £300 per tCO₂/y.

Outstanding carbon emissions are 1,551kg/CO₂ per year, over 30 years this equals 46,530 kg/CO₂ or 46.53 tCO₂/y.

46.53 x £300 = **£13,959** to pay Haringey council to meet the zero carbon, 100% reduction over Part L policy.

Conclusions

RECOMMENDATION

The energy strategy for the proposed scheme is to use a highly efficient Air Source Heat Pump (ASHP) as main heating and DHW system, alongside advanced energy efficiency fabric measures to meet the carbon emissions reductions target.

The proposal is to use advanced fabric efficiency standards, surpassing Part L requirements. The thermal performance targets of the dwelling are the following: U-Values of 0.10 W/m²K for the ground floor, 0.11 W/m²K for the roof, 0.15 W/m²K for walls and high-performance triple-glazed windows of 0.95 W/m². A maximum air permeability of 3 m³/m²/hr at 50 pa is targeted, and to be achieved on site. Thermal bridging will also be kept to a minimum, with an average Y-value of 0.06, following LABC details, thus going beyond accredited construction details as a minimum.

In addition, MVHR ventilation will keep the house well ventilated and surpass Part F requirements.

CO₂ SAVINGS SUMMARY

The baseline carbon emissions for the scheme are **5,602 kgCO₂/yr**. Following implementation of measures within this report; a total saving of **4,051 kgCO₂/yr** will be made, a **72.3%** overall carbon reduction before offsetting the remainder. These measures include:

- **Be Lean** (16.2% savings over baseline): Energy efficiency measures to improve the building fabric and services: Very high-performance U-Values (0.15 for walls, 0.11 for roof, 0.10 for the ground floor and 0.95 for windows in W/m²K), best practice air tightness (maximum of 3 m³/m²/hr at 50 Pa), full MVHR and best practice attention to thermal bridging at an average Y-value of 0.06.
- **Be Clean** (0% savings over Lean case); No further savings through the use of heat networks are planned.
- **Be Green** (56.1% savings over clean case): Low carbon heating and hot water through ASHP for clean heating and hot water for the scheme.
- **Offset** (27.7% savings): A payment of **£13,959** is required to pay Haringey council to be 100% zero carbon, as per their offset scheme.

Part L

The scheme meets Building Regulations Part L and subsequent revisions.

Appendix A

SAP results and energy calculations

Area	TER CO2	Lean CO2	Clean CO2	Green CO2
692.50	8.09	6.78	6.78	2.24

TER CO2	Lean CO2	Clean CO2	Green CO2
5,602.33	4,695.15	4,695.15	1,551.20

Appendix B

Water Calculations

Summary for Input Data

Property Reference	Sheldon Avenue	Issued on Date	01/09/2023
Assessment Reference	Proposed no pv	Prop Type Ref	
Property	26, Sheldon Avenue, London, N6 4JT		

SAP Rating	87 B	DER	2.24	TER	8.05
Environmental	97 A	% DER < TER			72.17
CO ₂ Emissions (t/year)	1.44	DFEE	38.65	TFEE	43.93
Compliance Check	See BREL	% DFEE < TFEE			12.02
% DPER < TPER	45.74	DPER	23.40	TPER	43.12

Assessor Details	Mr. Nicholas Bowen	Assessor ID	D719-0001
Client	Green Tiger, Ross Standaloft		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	Northwest
Property Tenture	1
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	4
3.0 Date Built	2023
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	Yes

7.0 Measurements	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Basement:	74.80 m	248.96 m ²	3.00 m
Ground floor:	58.70 m	204.18 m ²	3.25 m
1st Storey:	56.90 m	163.15 m ²	3.00 m
2nd Storey:	37.40 m	76.21 m ²	1.94 m

8.0 Living Area	34.30	m ²
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9.0 External Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
	Basement walls	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.15	60.00	224.40	200.64	0.00	None	23.76	Enter Gross Area
	External Walls	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.15	60.00	361.47	254.52	0.00	None	106.95	Enter Gross Area
	Dwarf walls	Timber Frame	Timber framed wall (one layer of plasterboard)	0.15	9.00	42.50	42.50	0.50	Room In Roof	0.00	Enter Gross Area
	Dormers	Timber Frame	Timber framed wall (one layer of plasterboard)	0.15	9.00	30.80	19.04	0.00	None	11.76	Enter Gross Area

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Basement	Dense block, plasterboard on dabs	75.00	414.60
	GF	Dense block, plasterboard on dabs	75.00	183.20
	GF	Plasterboard on timber frame	9.00	101.50
	FF	Dense block, plasterboard on dabs	75.00	128.50
	FF	Plasterboard on timber frame	9.00	142.00
	SF	Plasterboard on timber frame	9.00	81.60

10.0 External Roofs	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	Flat SF	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	22.80	0.00	None	0.00	Enter Gross Area	0.00
	Flat Base	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	44.78	0.00	None	0.00	Enter Gross Area	0.00
	Flat GF	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	41.03	0.00	None	0.00	Enter Gross Area	0.00
	Ceiling FF	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	86.94	0.00	None	0.00	Enter Gross Area	0.00

Summary for Input Data



Pitch	External Slope	Plasterboard, insulated slope	0.11	9.00	36.26	0.00	None	0.00	Enter Gross Area	0.00
Dormer	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	25.90	0.00	None	0.00	Enter Gross Area	0.00

10.2 Internal Ceilings

Description	Storey	Construction	Area (m²)
Basement	Basement	Plasterboard ceiling, carpeted chipboard floor	204.18
GF	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	163.15
FF	+1	Plasterboard ceiling, carpeted chipboard floor	76.21

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Basement floor	Ground Floor - Solid	Basement	Slab on ground, screed over insulation	0.10	None	0.00	110.00	248.96

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
GF		Plasterboard ceiling, carpeted chipboard floor	9.00	204.18
FF		Plasterboard ceiling, carpeted chipboard floor	9.00	163.15
Internal Floor 3		Plasterboard ceiling, carpeted chipboard floor	9.00	76.21

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Triple Low-E Soft 0.05			0.57		0.70	0.95
Doors	Manufacturer	Solid Door							1.00

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Front door	Doors	External Walls	North West	3.24	
Front elevation	Windows	External Walls	North West	21.08	
Front dormer	Windows	Dormers	North West	3.36	
Side elevation	Windows	External Walls	North East	9.23	
Side dormer	Windows	Dormers	North East	1.68	
Front elevation	Windows	External Walls	North West	21.08	
Rear dormer	Windows	Dormers	South East	5.04	
Rear elevation	Windows	External Walls	South East	41.82	
Side dormer	Windows	Dormers	South West	1.68	
Side ele	Windows	External Walls	South West	10.50	
Rear basement	Windows	Basement walls	South East	9.72	
Side basement	Windows	Basement walls	North East	7.02	
Side basement	Windows	Basement walls	South West	7.02	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Gov Approved Scheme	64.70	0.02	0.02	Yes
E3 Sill	Gov Approved Scheme	63.50	0.02	0.02	Yes
E4 Jamb	Gov Approved Scheme	190.24	0.02	0.02	Yes
E5 Ground floor (normal)	Gov Approved Scheme	74.80	0.05	0.05	Yes
E6 Intermediate floor within a dwelling	Gov Approved Scheme	153.00	0.00	0.00	No
E16 Corner (normal)	Gov Approved Scheme	73.60	0.04	0.04	No
E14 Flat roof	Table K1 - Default	62.90	0.16	0.16	No
E10 Eaves (insulation at ceiling level)	Gov Approved Scheme	51.00	0.06	0.06	No
R8 Roof to wall (rafter)	Table K1 - Default	37.40	0.12	0.12	No
R9 Roof to wall (flat ceiling)	Table K1 - Default	8.40	0.32	0.32	No
R7 Flat ceiling (inverted)	Table K1 - Default	8.40	0.12	0.12	No

Y-value W/m²K

18.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Test Method

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

Approved Installation

Mechanical Ventilation data Type

Type

MV Reference Number

Summary for Input Data

Configuration	7
Manufacturer SFP	0.99
Duct Type	Rigid
MVHR Efficiency	84.00
Wet Rooms	7
SFP from Installer Commissioning Certificate	Yes
MVHR System Location	Inside heated envelope (installed exclusively)
Duct Installation Specification	Level 1

20.0 Fans, Open Fireplaces, Flues

21.0 Fixed Cooling System	Yes	
Cooled Area	150	m ²
Data Source	SAP table	
Energy Class	A+++	

22.0 Lighting

No Fixed Lighting	No				
	Name	Efficacy	Power	Capacity	Count
	Lighting 1	81.00	10	810	46

24.0 Main Heating 1	Database	
Percentage of Heat	100.00	%
Database Ref. No.	102711	
Fuel Type	Electricity	
In Winter	0.00	
In Summer	0.00	
Model Name	AE120JXYDEH	
Manufacturer	Samsung Electronics Air Conditioner Europe B.V.	
System Type	Heat Pump	
Controls SAP Code	2207	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
Flow Temperature	Enter value	
Flow Temperature Value	45.00	

25.0 Main Heating 2	None
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26.0 Heat Networks	None
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Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1									
Heat source 2									
Heat source 3									
Heat source 4									
Heat source 5									

27.0 Secondary Heating

Secondary Heating	Manufacturer	
SAP Code	633	
SHS efficiency	90.00	%
HETAS Approved System	Yes	
Test Method	BS EN 613	
Manufacturer	tbc	
Model Name	tbc	

Summary for Input Data

28.0 Water Heating

Water Heating	Main Heating 1
SAP Code	901
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	Yes
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
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28.3 Waste Water Heat Recovery System Instantaneous System 1

Database ID	80073
Brand Model	RECOUP, Propipe+
Details	Year: 2012 + 2014 Efficiency: 0 Utilisation factor: 0.975

29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	500.00	L
Loss	1.90	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	

31.0 Thermal Store

Integrated	
Thermal Store Pipework	connected by <= 1.5 m pipework

34.0 Small-scale Hydro

None												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost	Typical savings per year	Ratings after improvement	
		SAP rating	Environmental Impact
£3,500 - £5,500	£262	B 87 B 88 0	A 97 A 98 0

Summary for Input Data

Property Reference	Sheldon Avenue	Issued on Date	01/09/2023
Assessment Reference	Lean	Prop Type Ref	
Property	26, Sheldon Avenue, London, N6 4JT		

SAP Rating	87 B	DER	6.78	TER	8.09
Environmental	92 A	% DER < TER			16.19
CO ₂ Emissions (t/year)	4.17	DFEE	38.58	TFEE	43.93
Compliance Check	See BREL	% DFEE < TFEE			12.19
% DPER < TPER	-0.86	DPER	43.69	TPER	43.32

Assessor Details	Mr. Nicholas Bowen	Assessor ID	D719-0001
Client	Green Tiger, Ross Standaloft		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	Northwest
Property Tenure	1
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	4
3.0 Date Built	2023
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	Yes

7.0 Measurements	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Basement:	74.80 m	248.96 m ²	3.00 m
Ground floor:	58.70 m	204.18 m ²	3.25 m
1st Storey:	56.90 m	163.15 m ²	3.00 m
2nd Storey:	37.40 m	76.21 m ²	1.94 m

8.0 Living Area	34.30	m ²
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9.0 External Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
	Basement walls	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.15	60.00	224.40	200.64	0.00	None	23.76	Enter Gross Area
	External Walls	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.15	60.00	361.47	254.52	0.00	None	106.95	Enter Gross Area
	Dwarf walls	Timber Frame	Timber framed wall (one layer of plasterboard)	0.15	9.00	42.50	42.50	0.50	Room In Roof	0.00	Enter Gross Area
	Dormers	Timber Frame	Timber framed wall (one layer of plasterboard)	0.10	9.00	30.80	19.04	0.00	None	11.76	Enter Gross Area

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Basement	Dense block, plasterboard on dabs	75.00	414.60
	GF	Dense block, plasterboard on dabs	75.00	183.20
	GF	Plasterboard on timber frame	9.00	101.50
	FF	Dense block, plasterboard on dabs	75.00	128.50
	FF	Plasterboard on timber frame	9.00	142.00
	SF	Plasterboard on timber frame	9.00	81.60

10.0 External Roofs	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	Flat SF	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	22.80	0.00	None	0.00	Enter Gross Area	0.00
	Flat Base	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	44.78	0.00	None	0.00	Enter Gross Area	0.00
	Flat GF	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	41.03	0.00	None	0.00	Enter Gross Area	0.00
	Ceiling FF	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	86.94	0.00	None	0.00	Enter Gross Area	0.00

Summary for Input Data



Pitch	External Slope	Plasterboard, insulated slope	0.11	9.00	36.26	0.00	None	0.00	Enter Gross Area	0.00
Dormer	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	25.90	0.00	None	0.00	Enter Gross Area	0.00

10.2 Internal Ceilings

Description	Storey	Construction	Area (m²)
Basement	Basement	Plasterboard ceiling, carpeted chipboard floor	204.18
GF	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	163.15
FF	+1	Plasterboard ceiling, carpeted chipboard floor	76.21

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Basement floor	Ground Floor - Solid	Basement	Slab on ground, screed over insulation	0.10	None	0.00	110.00	248.96

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
GF		Plasterboard ceiling, carpeted chipboard floor	9.00	204.18
FF		Plasterboard ceiling, carpeted chipboard floor	9.00	163.15
Internal Floor 3		Plasterboard ceiling, carpeted chipboard floor	9.00	76.21

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Triple Low-E Soft 0.05			0.57		0.70	0.95
Doors	Manufacturer	Solid Door							1.00

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Front door	Doors	External Walls	North West	3.24	
Front elevation	Windows	External Walls	North West	21.08	
Front dormer	Windows	Dormers	North West	3.36	
Side elevation	Windows	External Walls	North East	9.23	
Side dormer	Windows	Dormers	North East	1.68	
Front elevation	Windows	External Walls	North West	21.08	
Rear dormer	Windows	Dormers	South East	5.04	
Rear elevation	Windows	External Walls	South East	41.82	
Side dormer	Windows	Dormers	South West	1.68	
Side ele	Windows	External Walls	South West	10.50	
Rear basement	Windows	Basement walls	South East	9.72	
Side basement	Windows	Basement walls	North East	7.02	
Side basement	Windows	Basement walls	South West	7.02	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Gov Approved Scheme	64.70	0.02	0.02	Yes
E3 Sill	Gov Approved Scheme	63.50	0.02	0.02	Yes
E4 Jamb	Gov Approved Scheme	190.24	0.02	0.02	Yes
E5 Ground floor (normal)	Gov Approved Scheme	74.80	0.05	0.05	Yes
E6 Intermediate floor within a dwelling	Gov Approved Scheme	153.00	0.00	0.00	No
E16 Corner (normal)	Gov Approved Scheme	73.60	0.04	0.04	No
E14 Flat roof	Table K1 - Default	62.90	0.16	0.16	No
E10 Eaves (insulation at ceiling level)	Gov Approved Scheme	51.00	0.06	0.06	No
R8 Roof to wall (rafter)	Table K1 - Default	37.40	0.12	0.12	No
R9 Roof to wall (flat ceiling)	Table K1 - Default	8.40	0.32	0.32	No
R7 Flat ceiling (inverted)	Table K1 - Default	8.40	0.12	0.12	No

Y-value W/m²K

18.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Test Method

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

Approved Installation

Mechanical Ventilation data Type

Type

MV Reference Number

Summary for Input Data

Configuration	6
Manufacturer SFP	0.99
Duct Type	Rigid
MVHR Efficiency	85.00
Wet Rooms	6
SFP from Installer Commissioning Certificate	Yes
MVHR System Location	Inside heated envelope (installed exclusively)
Duct Installation Specification	Level 1

20.0 Fans, Open Fireplaces, Flues

21.0 Fixed Cooling System	No
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22.0 Lighting

No Fixed Lighting	No				
	Name	Efficacy	Power	Capacity	Count
	Lighting 1	81.00	10	810	46

24.0 Main Heating 1

	Database	
Percentage of Heat	100.00	%
Database Ref. No.	18524	
Fuel Type	Mains gas	
In Winter	88.70	
In Summer	79.70	
Model Name	VOGUE MAX SYSTEM	
Manufacturer	Ideal Boilers	
System Type	Regular boiler	
Controls SAP Code	2110	
Delayed Start Stat	No	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators and Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
Flow Temperature	Unknown	
Boiler Interlock	Yes	

25.0 Main Heating 2	None
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26.0 Heat Networks	None
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Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1									
Heat source 2									
Heat source 3									
Heat source 4									
Heat source 5									

27.0 Secondary Heating

Secondary Heating	Manufacturer	
SAP Code	633	
SHS efficiency	90.00	%
HETAS Approved System	No	
Test Method	BS EN 613	
Manufacturer	tbc	
Model Name	tbc	

Summary for Input Data

28.0 Water Heating

Water Heating	Main Heating 1
SAP Code	901
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
Cold Water Source	From mains
Bath Count	1

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
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28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness Type	150 mm
Cylinder Volume	310.00
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	No

31.0 Thermal Store

None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost	Typical savings per year	Ratings after improvement	
		SAP rating	Environmental Impact
£3,500 - £5,500	£254	B 88	A 92
		B 89	A 92
		0	0

26 Sheldon Road - Water Calculator

Installation Type	Unit of Measure	Capacity/Flow rate (1)	Use Factor (2)	Fixed use (litres/person/day) (3)	Litres/person/day = [(1)x(2)] + (3) (4)
WC (single flush)	Flush Volume (litres)		4.42	0.00	0
WC (dual flush)	Full flush Volume (litres)	4	1.46	0.00	5.84
	Part flush Volume (litres)	2	2.96	0.00	5.92
WC (multiple fittings)	Average effective flushing Volume (litres)		4.42	0.00	0
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	3.50	1.58	1.58	7.11
Bath (where shower also present)	Capacity to overflow(litres)	180.00	0.11	0.00	19.80
Shower (where bath also present)	Flow Rate(litres / minute)	8.00	4.37	0.00	34.96
Bath Only	Capacity to overflow(litres)		0.50	0.00	0
Shower Only	Flow Rate (litres/minute)		5.60	0.00	0
Kitchen/Utility room sink taps	Flow rate (litres/minute)	4.00	0.44	10.36	12.12
Washing Machine	(Litres/kg dry load)	9.00	2.1	0.00	18.90
Dishwasher	(Litres/place setting)	0.90	3.6	0.00	3.24
Waste disposal unit	(Litres/use)	☐ Present	3.08	0.00	0
Water Softener	(Litres/person/day)		1.00	0.00	0
	(5)	Total Calculated use (litres/person/day) =SUM(column 4)			107.89
	(6)	Contribution from greywater (litres/person/day)			0
	(7)	Contribution from rainwater (litres/person/day)			0
	(8)	Normalisation factor			0.91
	(9)	Total water consumption (Code for Sustainable Homes) = [(5)-(6)-(7)]x(8) (litres/person/day)			98.18
	(10)	External water use			5.0
	(11)	Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)			103.2

Installation Type	Type	Litres/Person/Day
WC (dual flush)		11.76
Taps		7.11
Baths (shower(s) present)		19.80
Showers (bath(s) present)		34.96
Kitchen Taps		12.12
Washing Machines		18.90
Dishwasher		3.24



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