



Watts Close

Energy Statement

September 2022

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DOCUMENT CONTROL SHEET

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DISCLAIMER

The information contained within this Report is based on Drawings and Specifications provided by the Design Team along with information assumed by NRG Consulting for the purposes of compliance where no other information was available. Any budget costs or plant sizing contained within this document are based upon available information and are to be taken as an estimation and guideline only.

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1. EXECUTIVE SUMMARY

- 1.1 NRG Consulting have been appointed to undertake an Energy Statement on a proposed major development at Watts Close, London, N15 5DQ within the London Borough of Haringey.
- 1.2 The proposed scheme is described as: “Demolition of 11 dwellings and community building and replace with 18 new homes for council rent. Erect 6 no. two-storey family houses (three and four bedrooms) and 12 apartments (one and two bedrooms) in 2 three-storey blocks including 2 wheelchair user dwellings. The proposals includes 2. on-site wheelchair parking bays, amenity and play space, landscaping, cycle and refuse/recycling storage.”
- 1.3 This document has been written to address Condition 4 of the planning permission which states:

“The development hereby approved shall be constructed in accordance with the Energy, Sustainability and Energy Assessment prepared by Sustain Quality (dated December 2021, v6) delivering a minimum 105% improvement on carbon emissions over 2013 Building Regulations Part L, with SAP10 emission factors, high fabric efficiencies, air source heat pumps (ASHPs) and minimum 56.1kWp solar photovoltaic (PV) energy generation.

(a) Prior to above ground construction, details of the Energy Strategy shall be submitted to and approved by the Local Planning Authority. This must include:

- Confirmation of how this development will meet the zero-carbon policy requirement in line with the Energy Hierarchy; .

- Confirmation of the necessary fabric efficiencies to achieve a minimum 18% reduction in SAP2012 carbon factors, including details to reduce thermal bridging;

-Location, specification and efficiency of the proposed ASHPs (Coefficient of Performance, Seasonal Coefficient of Performance, and the Seasonal Performance Factor), with plans showing the ASHP pipework and noise and visual mitigation measures;

- Specification and efficiency of the proposed Mechanical Ventilation and Heat Recovery (MVHR), with plans showing the rigid MVHR ducting and location of the unit;

- Details of the PV including: a roof plan; the number, angle, orientation, type, and efficiency level of the PVs; how overheating of the panels will be minimised; their peak output (kWp) and the final carbon reduction at the Be Green stage of the energy hierarchy;

- A metering strategy.”

RESULTS

Table 1: Final Carbon Emissions

	CO ₂ Emissions (Tonnes per Annum) (SAP 10)	
	Regulated	
Baseline: Part L 2013 of the Building Regulations Compliant Development (TER)	25.6	Regulated CO ₂ Savings at 'Be Lean' over Part L 2013 27%
Be Lean: Energy Demand Reduction	18.7	
Be Clean: Supply Energy Efficiently	18.7	
Be Green: Renewable Energy	-2.0	
Regulated CO ₂ Savings at 'Be Green' over Part L 2013	108%	

2. BE LEAN – ENERGY EFFICIENT MEASURES

2.1 In order to estimate the predicted energy demand and regulated CO₂ emissions for the site, SAP Calculations have been carried out by a licensed and OCDEA accredited SAP Assessor using Elmhurst Design SAP 2012 and converted into SAP 10 figures using the GLA's conversion spreadsheet (V1.2).

2.2 The baseline CO₂ emissions covered by Part L 2013 of the Building Regulations will be expressed as the Target Emissions Rate (TER), obtained from the SAP calculations. SAP Calculations cover regulated energy use that comprises of:

- Heating - Hot Water
- Lighting - Pumps and Fans

PASSIVE AND ACTIVE DESIGN

2.3 The design of the development prioritises passive measures to minimise heat loss. The U-values and the air permeability rate have been selected to exceed the minimum requirements of the Building Regulation and the development will incorporate efficient building services to limit carbon emissions, including a NOX-free heating system and low energy lighting. The proposed building services are compliant with the recommendations of the Domestic Building Services Compliance Guide (2013).

Table 2: Be Lean Reduction

	CO ₂ Emissions (Tonnes per Annum) – SAP10	CO ₂ Emissions (Tonnes per Annum) – SAP12
	Regulated	Regulated
Baseline: Part L 2013 of the Building Regulations Compliant	25.6	19.1
Be Lean: Energy Demand Reduction	18.8	14.5
Regulated CO₂ Savings at 'Be Lean' over Part L 2013	26.91%	23.8%

Table 3: Proposed Fabric Specification

ELEMENT	PART L1A LIMITING FABRIC PARAMETERS	PROPOSED U-VALUES (W/m ² K)
<i>Walls</i>		
External Walls (Houses and Flats)	0.3 W/m ² K	0.16 W/m²K
Sheltered Walls – Flats	0.3 W/m ² K	0.17 W/m²K
Party Walls	0.3 W/m ² K	0.0 W/m²K
<i>Roof</i>		
Roof	0.2 W/m ² K	0.12 W/m²K
<i>Floor</i>		
Ground Floor	0.3 W/m ² K	0.08-0.09 W/m²K
<i>Openings</i>		
Windows	2.2 W/m ² K	0.97 W/m²K
Front Doors	2.2 W/m ² K	1.14 W/m²K
<i>Thermal Bridging</i>		
CBA Full Fill details and ACDs		

MVHR SYSTEMS

- 2.4 The houses and flats will use System 4 Ventilation – MVHR. The ventilation for the flats will be integrated into the all-in-one associated Exhaust Air Heat Pump whereas the houses will use an independent MVHR system.

Plans showing these ventilation layouts can be seen on Figures 1 and 2.

Table 4: Proposed Mechanical and Electrical Specification

ELEMENT	PROPOSED DETAILS
Air Permeability	3 m ³ /(hm ²) @50Pa
Ventilation - Flats	System 4 – Nilan Compact P
Ventilation - Houses	System 4 – Vectaire WHHR Midi
Heating – Be Lean <u>Only</u>	Gas Combi Boiler – 89.5% Efficient
Heating Controls	Time and Temperature Zone Controls
Heat Emitters – Houses	Underfloor & Radiators
Heat Emitters - Flats	Radiators
Lighting	100% Low Energy

DETAIL	SPECIFICATION
Model	Nilan Compact P
Dimensions	550 x 300 x 1.100 mm
Duct Type	Rigid
Efficiency	85%
SFP	0.70 W/l/s
Manufacturer	Nilan A/S

Table 5: Ventilation Details – (Flats)

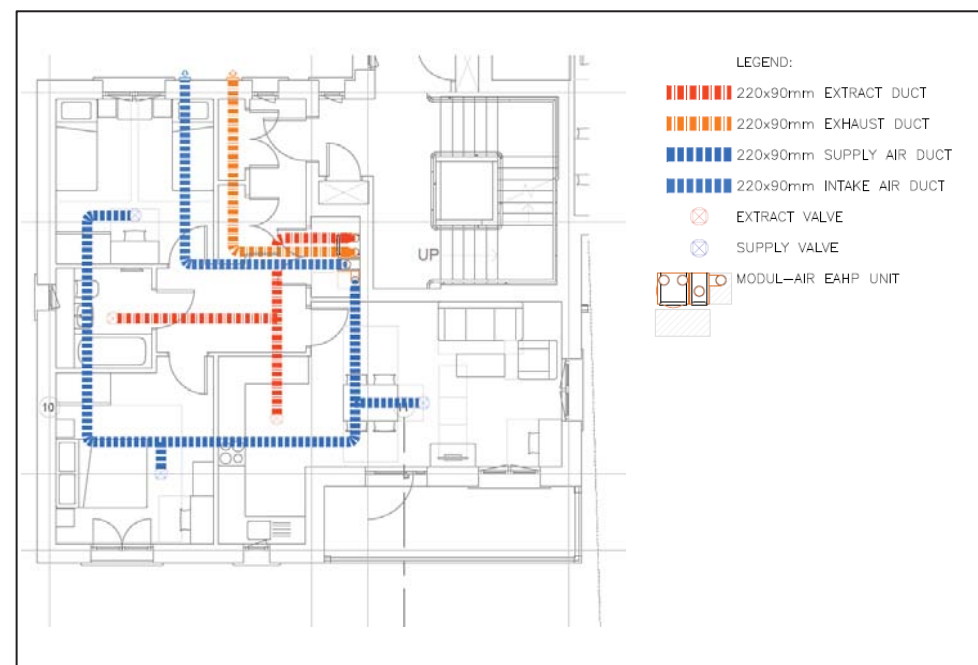


Figure 1: MVHR Layout - Flats

DETAIL	SPECIFICATION
Model	Vectaire Midi WHHR
Dimensions	600mm (W) * 382mm (L) * 612mm (H)
Efficiency	Up to 94%
SFP	0.50-0.70 W/l/s
Manufacturer	Vectaire

Table 6: Ventilation Details - Houses

Metering Strategy

2.5 Both Exhaust Air Heat Pumps and Air Source Heat Pumps (are supplied individually per property.

As such the only metering for the development will be from each individual smart meter associated with these units.

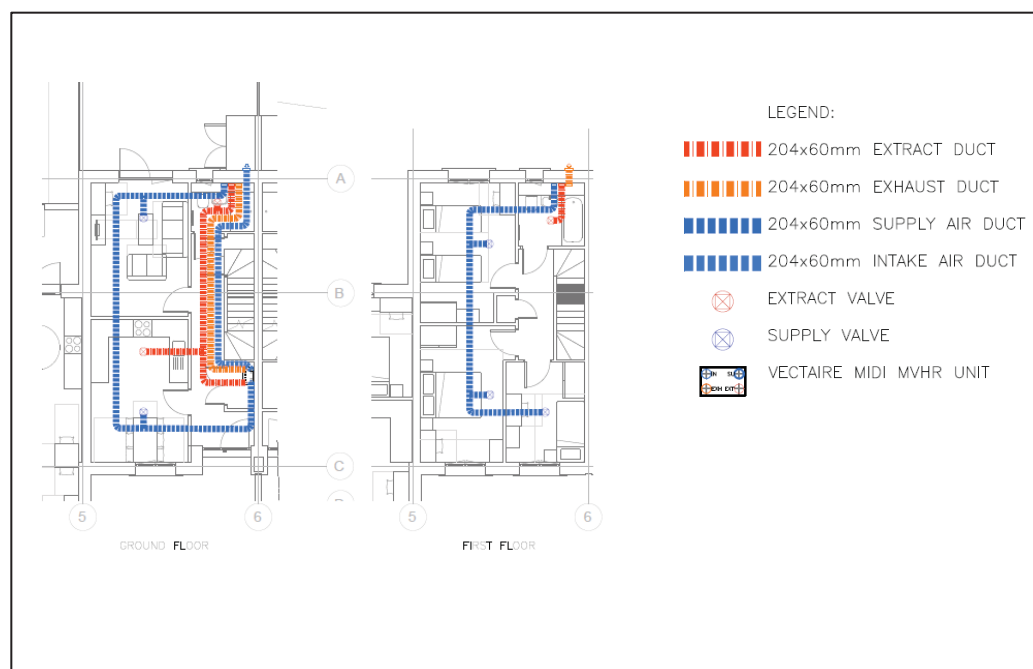


Figure 2: MVHR Layout - House

3. RENEWABLE TECHNOLOGIES – ASHP & EAHP

- 3.1 In order to achieve the required CO₂ reduction, the implementation of low carbon or renewable technology will be required. For this development, EAHP have been selected as the most suitable technology.

EXHAUST AIR HEAT PUMPS

- 3.2 To provide renewable heating and hot water, Exhaust Air Heat Pumps (EAHP) are proposed for the Flats. An EAHP system combines the aspects of both a conventional air source heat pump and a mechanical ventilation with heat recovery system (MVHR) to provide 100% of the space heating requirements and DHW demand for a dwelling. The system works optimally with smaller, well-insulated, apartments. These systems can reduce a home's energy consumption for heating by up to 50% compared to conventional heating systems.
- 3.3 Therefore this report shows that this new build development is being designed with the new incoming Part L in mind and that the proposed heating negates the need for fossil fuels.

EAHP Provision & Details

- 3.4 Exhaust Heat Pumps are proposed as the primary heat source, servicing each flat individually. They have been chosen because:
- It is a high efficiency system that can cater for the space & water heating for the proposed development;
 - The system functions effectively with the designed layout and flat dwelling type;
 - It can be integrated with the proposed ventilation strategy; and,
 - It is simple to install when compared to other renewable technologies.



Figure 3: Example EAHP Unit

Table 7: Proposed EAHP Specification

EAHP System Details	
Dwellings to be Heated	12
Number of Heat Pumps	12
Size of Heat Pumps	550 x 300 x 1.100 mm
Make and Model	Nilan Compact P
SCOP	5.11
COP	4.27 / 4.5
Fraction of Heat	100%



Figure 4: EAHP Pipework Schematic

AIR SOURCE HEAT PUMPS

3.5 To provide renewable heating and hot water for the houses, individual Air Source Heat Pumps are proposed. An ASHP extracts heat from ambient air via a heat exchanger and raises the temperature of an internal refrigerant via the compression cycle.

The ASHPs will consist of an internal unit and an external unit, and the design will be in-line with the schematic shown via Figure 5.

3.6 Therefore this report shows that this new build development is being designed with the new incoming Part L in mind and that the proposed heating negates the need for fossil fuels.

ASHP Provision & Details

3.7 As part of the on-site heat provision, Air Source Heat Pumps are proposed as the heat source for the houses. They have been chosen because:

- It is a high efficiency system that can cater for the space heating and cooling of the most energy-intensive areas of the proposed development;
- Requires less capital cost than GSHP and other renewable technologies
- It is simple to install when compared to other renewable technologies.

Table 6: Proposed ASHP Specification

ASHP System Details	
Dwellings to be Heated	6
Number of Heat Pumps	6
Make and Model	Samsung Electronics Heat Pump (Samsung Electronics AE080RXYDEG)
SCOP	4.44
COP	3.49 / 2.81 / 2.98 / 2.43
Fraction of Heat	100%

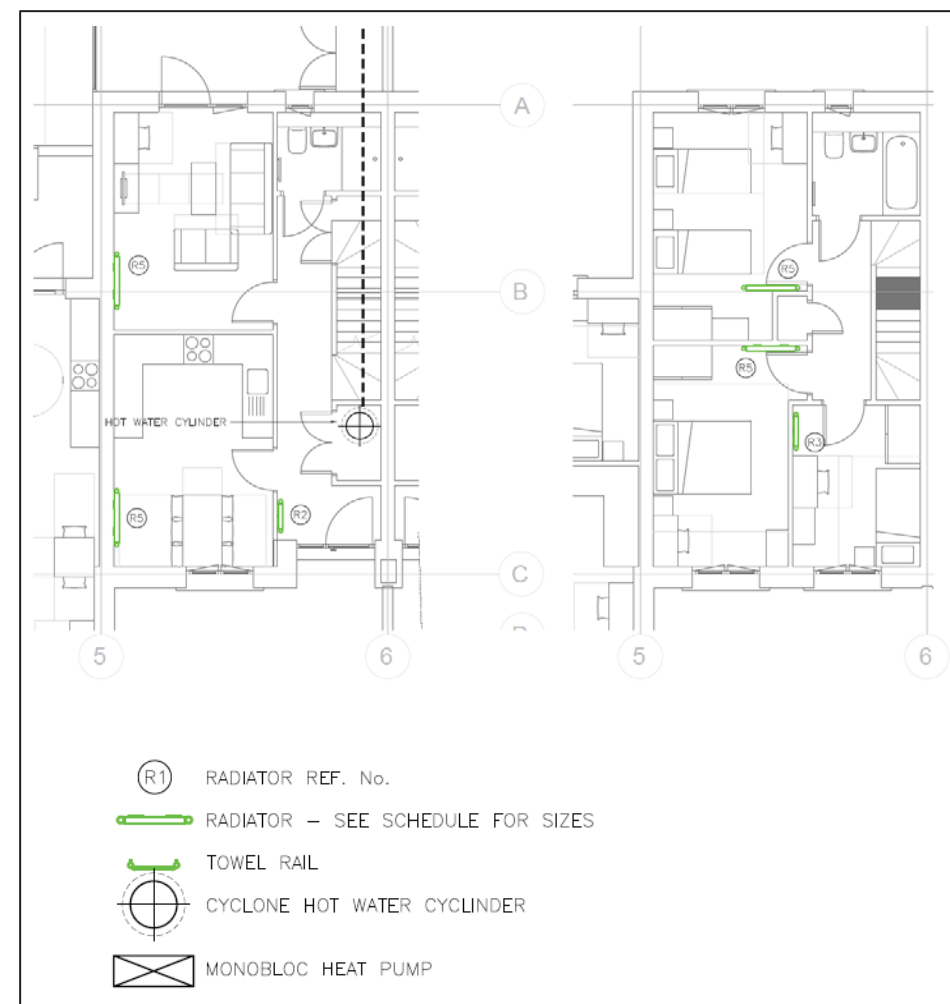


Figure 5: ASHP Pipework Schematic

4. RENEWABLE TECHNOLOGIES – PHOTOVOLTAICS

- 4.1 To assist in achieving the desired CO₂ reduction, a photovoltaic array will be installed across the site. The details of this array can be seen across via Table 7 and Figure 6. Full PV illustrative drawings can be found in Appendix 4 of this report.

Table 7: Proposed PV Specification

PV System Details	
CO ₂ Reduction Provided	10.0 tonnes CO ₂ /year
CO ₂ Offset via 1kWp	0.177
PV Proposed	56.1 kWp
Module Output	360 Watts
Number of Panels (sitewide)	156
Panel Orientation	Horizontal
Tilt of Collectors	Horizontal
Over-Shading Factor	<20%

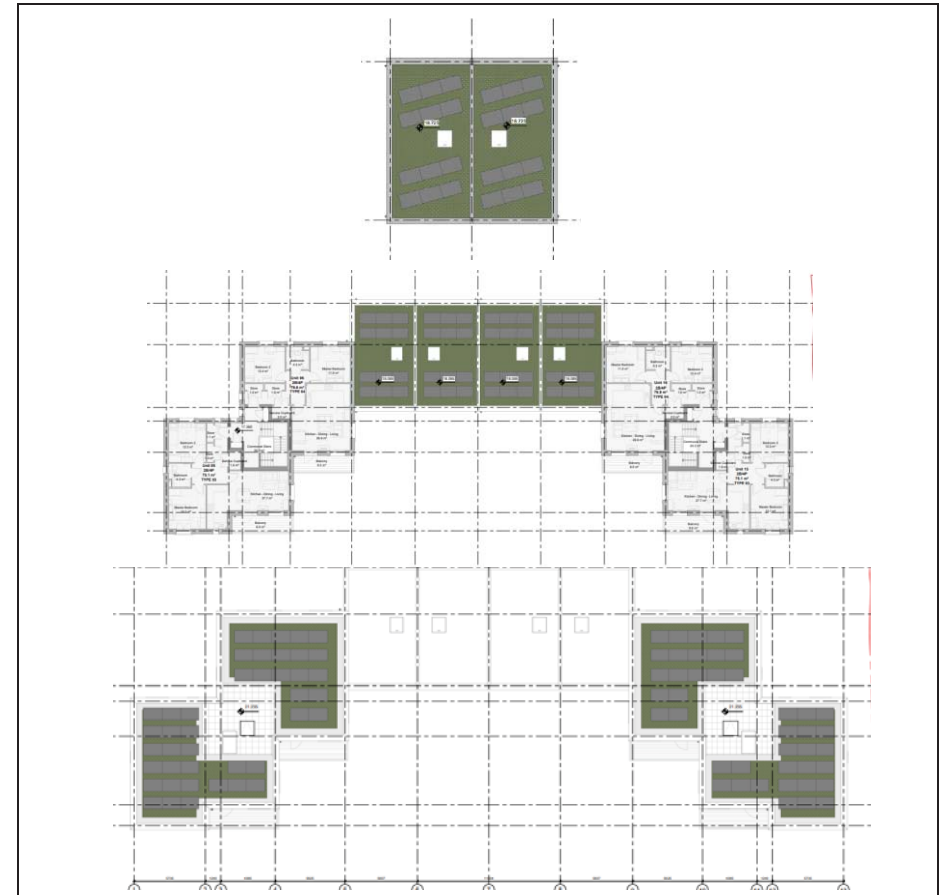


Figure 6: Proposed PV Drawing (for illustration only – not for Construction)

5. CONCLUSION

- 5.1 This document illustrates the Energy Strategy and regime for the Watts Close development. This report has been written to address Condition 4 of the proposed development, by illustrating on the Energy elements below:
- 1) Delivering 105% improvement of carbon emissions over 2013 Building Regulations Part L, with SAP10 emission factors via:
 - a. Air Source Heat Pumps and Exhaust Air Heat Pumps
 - b. High Fabric Efficiencies
 - c. 56.1 kWp solar array
 - 2) Fabric Efficiencies to achieve 18% reduction in SAP2012 carbon factors.
 - 3) Location, specification, and efficiency of the proposed ASHPs (including Coefficient of Performance, Seasonal Coefficient of Performance), as well as plans showing ASHP pipework and noise and visual mitigation measures.
 - 4) MVHR Specification, including efficiencies, and ducting plans.
 - 5) PV Details, including efficiencies, plans, orientations, angles, types, number, power.
- 5.2 The table across demonstrates the >105% improvement overall achieved by the scheme. This has been calculated using SAP12, along with SAP10 emissions factors.
- 5.3 Overall the fabric efficiencies (Be Lean) allow the scheme a >18% reduction in both SAP12 and SAP12 figures that can be seen in Table 2 of this report.
- 5.4 Full details of the proposed ASHPs (including EAHPs) can be seen in section 3 of this report.

- 5.5 Full details of the proposed MVHR specifications can be seen in section 3 of this report.
- 5.6 Full PV details can be seen in section 4 of this report, as well as in appendix 4 of this report.

	CO ₂ Emissions (Tonnes per Annum) (SAP 10)	
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