NETHERHALL GARDENS RESIDENTIAL BLOCKS
LONDON BOROUGH OF CAMDEM
NW3 5TL

Energy Statement

December 2022

THE DESIGN COLLECTIVE

Contents

1.0 Executive Summary

The following report has been produced to support the developed design scheme for the new residential development known as Nether Gardens. As a part of the development, a block of 3No flats will be built. The new block containing 3No new flats adjacent to the existing block and 4No refurbished flats.
The report identifies the amendments from the original planning stages of the design to represent the final design proposals for construction.

1.1 Energy & Carbon Targets

The development has been designed to meet and exceed the Building Regulations relevant at the time of plans submission. The development will be brought forward under Approved Document Part L 2013, and this has been used as the basis of previous and current energy statement.

As the development falls under 'The London Plan' it is required to achieve a 35% reduction in carbon emissions compared to the minimum requirements of Part L 2013.

The London Plan requires new residential developments to offset all remaining emissions to zero through a carbon offset payment to the London Borough of Camden requires that major development achieves a 19% reduction in carbon emissions through the use of low and zero carbon technologies.

1.2 Energy Statement

The planning stage Energy Statement has been structured in accordance with the energy hierarchy, as set out in the London Plan.

- Be Lean,
- Be Clean,
- Be Green.

This philosophy has been carried through into the detailed design stage and the proposals for the scheme have been developed in accordance with the desire to achieve an energy efficient and sustainable development.

The dwellings will be designed to achieve optimum energy performance and will incorporate the following design features:

- Significantly exceed the minimum fabric requirements of Part L1A (2013) of the Building Regulations.
- All dwellings will include 100% low energy lighting.
- All dwellings will be mechanically ventilated with both supply and extract air with the inclusion of heat recovery (MVHR).
- Each building will be served by a dedicated heat pump system to provide heating and hot water provision, therefore gas boilers have been disregarded and will not be installed.

- The previous energy statement had already identified that It is not possible to serve the development from a district heating network nor to use a CHP unit. To this end these solutions have not been further considered.

- Having checked the existing Heat Map we can confirm that there is not an existing/ proposed energy centre in the proximity to the flats and therefore connections to a district heat network have deemed not necessary.

- Renewable electricity will also be generated on site via 9No solar photovoltaic panels of 2.5Wp each providing 2.250kWp

1.3 Results

Accredited Design SAP 2012 software was used to determine the regulated and non-regulated carbon emissions and FEE (fabric energy efficiency) standards for the development.

The results were then extrapolated across the whole development to assess the total baseline carbon emissions, the carbon emissions after the application of energy efficiency measures and the carbon emissions after the application of low and zero carbon technologies.

The results are shown in Table 1 below and exceed the 35% target. In addition, the FEE for all the modelled units were found to exceed the target requirements.

Dwelling	DER	TER	DFEE	TFEE	TFA
Flat 1	2.11	13.51	43.9	45.1	71.07
Flat 2	1.89	12.73	39.3	41.5	66.86
Flat 3	1.98	17.17	48.2	50	91.01

Calculation Summary	
Total Floor Area (m2)	246
Average TER	14.47
Average DER	1.99
Average DFEE	43.8
Average TFEE	45.53
Compliance % Improvement DER/TER % Improvement DFEE/TFEE	Pass 86.24 3.6

Fig 1: Table of SAP Results

Camdem Council requires that major development achieves a 20% reduction in carbon emissions through the use of low and zero carbon technologies.

2.0 Reduction of Energy Demand

The first step to achieving Building Regulations compliance and the targets outlined previously is to reduce energy demand. The measures associated with reducing demand can be termed as 'Energy Efficiency Measures'. The Proposed Development will incorporate a number of relevant energy conservation measures; the benefits of which are discussed below.

In summary the following measures will be included:

- Air Tightness Target of 2.5 m3 /hr.m2 @ 50 Pa
- High performance building fabric (See Table Below)
- High performance glazing (See Table Below)
- 100% low energy lighting
- MVHR

2.1 Building Fabric

The layout will ensure that all of the units will benefit from high levels of natural daylight while also balancing the risk of overheating. The developed design is based on an overall U-value for the glazing of 1.3 W/m².K.

For the purposes of this updated addendum report assessment this value has been used. Glazing to the dwellings is specified to achieve a g-value (energy transmittance) of 0.63, this is considered to provide an appropriate year-round balance between maximising daylighting and beneficial wintertime solar gain, and minimising summertime solar gains to reduce the overheating risk and need for comfort cooling.

The current proposals for the building fabric performance for the Proposed Development are summarised in the following Table.

Element	Proposed Building Fabric Design
External Wall U-value (W/m² K)	0.17
Party Wall U-value (W/m² K)	0.00
Ground Floor U-value (W/m² K)	0.15
Roof U-value (W/m² K)	0.15
Glazing U-value (W/m² K)	1.3
Glazing G-value	0.63
Air Permeability (m³ /hr.m2 @ 50 Pa)	2.5
Thermal Mass (kJ/m² K)	100 (low)
Average Thermal Bridging (W/m2 K)	0.101

Fig 2: Proposed Fabric Performance Targets

2.2 Building Services

High performance MEP building services strategy is proposed for the scheme. The following table below identifies the general specification for the heating system, lighting, and ventilation strategy for the proposed dwellings.

Element	General Specification
Ventilation	All units will have Whole House Heat Recovery ventilation (MVHR). Windows are also openable.
Internal lighting	100% low energy
Primary Heat Source	Dedicated Heat pumps for each flat for heating and hot water provision
Heating Controls	Central Programmer and space thermostat to each space
Heating System	Underfloor heating
Overheating Control/Cooling	MVHR with Summer Bypass, large openable windows, cross-ventilation

Fig 3: Proposed Services Strategy

2.3 Carbon Emissions Reduction

All renewable energy technologies have been considered previously within Energy Statement report submitted at planning stage. The outcomes of this study concluded that the most appropriate form of renewable technology for the building was to utilise PV panels and

The SAP calculations incorporating all the fabric improvements, the services strategy as outlined above and the inclusion of PV generates an energy benefit inline with the original energy statement.

A photovoltaic system at a 30º inclination and orientated in line with the building has been included in this scheme.

Renewable electricity will also be generated on site via 9No solar photovoltaic panels of 2.5Wp each providing 2.250kWp (0.75kWp each flat).

Results from the sample properties are as summarised within the following table.

Dwelling	DER	TER	% Improvement
Flat 1	2.11	13.51	84.38 %
Flat 2	1.89	12.73	85.15 %
Flat 3	1.98	17.17	88.46 %

Fig 4: Summary of Individual Part L Compliance/Improvement

Dwelling	DFEE	TFEE	% Improvement
Flat 1	43.9	45.1	2.6 %
Flat 2	39.3	41.5	5.3 %
Flat 3	48.2	50	3.6 %

Fig 5: Summary of Individual Fabric Energy Efficiency Compliance/Improvement

Through the use of the Be Lean, Be Clean and Be Green framework, regulated carbon emissions have been shown to be reduced by 85.99% against Part L 2013, exceeding the GLA target.

Appendix 1

Sample SAP Outputs

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Fri 09 Dec 2022 14:24:22

Project Information			
Assessed By	Neil Ingham	Building Type	Flat, Semi-detached
OCDEA Registration	STRO010943	Assessment Date	2022-12-09

Dwelling Details			
Assessment Type	As designed	Total Floor Area	96 m^2
Site Reference	FLAT 1	Plot Reference	23160
Address	NW3 5TL		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*13.51 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	2.11 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*71.07 kWh_{PE}/m^2*	
Dwelling primary energy	23.86 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*45.1 kWh/m^2*	
Dwelling fabric energy efficiency	43.9 kWh/m^2	OK

2a Fabric U-values				
Element	***Maximum permitted average U-Value [W/m^2K]***	**Dwelling average U-Value [W/m^2K]**	**Element with highest individual U-Value**	
External walls	*0.26*	0.17	EW (0.18)	OK
Party walls	*0.2*	0	PW (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.15	GF (0.15)	OK
Roofs	*0.16*	0.15	FR (0.15)	OK
Windows, doors, and roof windows	*1.6*	1.3	1 (1.3)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	**Net area [m^2]**	**U-Value [W/m^2K]**
Exposed wall: EW	22.49	0.18
Exposed wall: BW	46.55	0.18
Exposed wall: SW	31.48	0.155
Party wall: PW	13.29	0 **(!)**
Ground floor: GF	96.37	0.15
Exposed roof: FR	10.93	0.15

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
1, Windows (1)	8.09	West	0.7	1.3
2, Windows (1)	10.29	East	0.7	1.3
3, Windows (1)	1.43	South	0.7	1.3

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	**Junction detail**	**Source**	**Psi value [W/mK]**	**Drawing / reference**
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.038 **(!)**	Not Provided

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Not government-approved scheme	0.026 **(!)**	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.028 **(!)**	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.16	Not Provided
External wall	E7: Party floor between dwellings (in blocks of flats)	Not government-approved scheme	0.07	Not Provided
External wall	E14: Flat roof	Not government-approved scheme	0.08	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.09	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.09	Not Provided
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.06	Not Provided
External wall	E25: Staggered party wall between dwellings	Not government-approved scheme	0.12	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))		
Maximum permitted air permeability at 50Pa	*8 m^3/hm^2*	
Dwelling air permeability at 50Pa	2.5 m^3/hm^2, Design value **(!)**	OK
Air permeability test certificate reference	Not Provided	

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	350.0%
Emitter type	Radiators
Flow temperature	55°C
System type	
Manufacturer	
Model	
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	170 litres
Declared heat loss	1.2 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat and HW separately timed	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	*75 lm/W*	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	*1.5 W/(l/s)*	
Specific fan power	0.43 W/(l/s)	OK
Minimum permitted heat recovery efficiency	*73%*	
Heat recovery efficiency	94%	OK
Manufacturer/Model		
Commissioning	Not Provided / Not Provided	

9 Local generation	
Technology type: **Photovoltaic system (1)**	
Peak power	0.83 kWp
Orientation	South
Pitch	30°
Overshading	None or very little
Manufacturer	Not Provided
MCS certificate	

10 Heat networks
N/A

11 Supporting documentary evidence
N/A

12 Declarations	
a. Assessor Declaration	
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	
Signed: Name:	Assessor ID: Date:
b. Client Declaration	
N/A	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Fri 09 Dec 2022 14:24:40

Project Information			
Assessed By	Neil Ingham	Building Type	Flat, Semi-detached
OCDEA Registration	STRO010943	Assessment Date	2022-12-09

Dwelling Details			
Assessment Type	As designed	Total Floor Area	94 m^2
Site Reference	FLAT 2	Plot Reference	23160
Address	NW3 5TL		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*12.73 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	1.89 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*66.86 kWh_{PE}/m^2*	
Dwelling primary energy	21.69 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*41.5 kWh/m^2*	
Dwelling fabric energy efficiency	39.3 kWh/m^2	OK

2a Fabric U-values				
Element	***Maximum permitted average U-Value [W/m^2K]***	**Dwelling average U-Value [W/m^2K]**	**Element with highest individual U-Value**	
External walls	*0.26*	0.17	EW (0.18)	OK
Party walls	*0.2*	0	PW (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.15	EF (0.15)	OK
Roofs	*0.16*	0.15	FR (0.15)	OK
Windows, doors, and roof windows	*1.6*	1.3	1 (1.3)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	**Net area [m^2]**	**U-Value [W/m^2K]**
Exposed wall: EW	77.67	0.18
Exposed wall: SW	28.2	0.155
Party wall: PW	15.29	0 **(!)**
Ground floor: EF	8.34	0.15
Exposed roof: FR	37.52	0.15

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
1, Windows (1)	7.59	West	0.7	1.3
2, Windows (1)	8.51	East	0.7	1.3
3, Roof windows (1)	2.99	South	0.7	1.3

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	**Junction detail**	**Source**	**Psi value [W/mK]**	**Drawing / reference**
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.038 **(!)**	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.026 **(!)**	Not Provided

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E4: Jamb	Not government-approved scheme	0.028 **(!)**	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.16	Not Provided
External wall	E7: Party floor between dwellings (in blocks of flats)	Not government-approved scheme	0.07	Not Provided
External wall	E14: Flat roof	Not government-approved scheme	0.08	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.09	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.09	Not Provided
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.06	Not Provided
External wall	E25: Staggered party wall between dwellings	Not government-approved scheme	0.12	Not Provided
Roof	R1: Head of roof window	Not government-approved scheme	0.08	Not Provided
Roof	R2: Sill of roof window	Not government-approved scheme	0.06	Not Provided
Roof	R3: Jamb of roof window	Not government-approved scheme	0.08	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))		
Maximum permitted air permeability at 50Pa	*8 m^3/hm^2*	
Dwelling air permeability at 50Pa	2.5 m^3/hm^2, Design value **(!)**	OK
Air permeability test certificate reference	Not Provided	

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	350.0%
Emitter type	Radiators
Flow temperature	55°C
System type	
Manufacturer	
Model	
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	170 litres
Declared heat loss	1.2 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat and HW separately timed	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	*75 lm/W*	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	*1.5 W/(l/s)*	
Specific fan power	0.43 W/(l/s)	OK
Minimum permitted heat recovery efficiency	*73%*	
Heat recovery efficiency	94%	OK
Manufacturer/Model		
Commissioning	Not Provided / Not Provided	

9 Local generation	
Technology type: **Photovoltaic system (1)**	
Peak power	0.83 kWp
Orientation	South
Pitch	30°
Overshading	None or very little
Manufacturer	Not Provided
MCS certificate	

10 Heat networks
N/A

11 Supporting documentary evidence
N/A

12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed: Name:	Assessor ID: Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Fri 09 Dec 2022 14:24:51

Project Information			
Assessed By	Neil Ingham	Building Type	Flat, Semi-detached
OCDEA Registration	STRO010943	Assessment Date	2022-12-09

Dwelling Details			
Assessment Type	As designed	Total Floor Area	56 m^2
Site Reference	FLAT 3	Plot Reference	23160
Address	NW3 5TL		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided, WF10 5QU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*17.17 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	1.98 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*91.01 kWh_{PE}/m^2*	
Dwelling primary energy	24.58 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*50 kWh/m^2*	
Dwelling fabric energy efficiency	48.2 kWh/m^2	OK

2a Fabric U-values				
Element	***Maximum permitted average U-Value [W/m^2K]***	**Dwelling average U-Value [W/m^2K]**	**Element with highest individual U-Value**	
External walls	*0.26*	0.17	EW (0.18)	OK
Party walls	*0.2*	0	PW (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.15	EF (0.15)	OK
Roofs	*0.16*	0.15	FR (0.15)	OK
Windows, doors, and roof windows	*1.6*	1.3	1 (1.3)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	**Net area [m^2]**	**U-Value [W/m^2K]**
Exposed wall: EW	62.37	0.18
Exposed wall: SW	29.09	0.155
Party wall: PW	14.36	0 **(!)**
Ground floor: EF	3.32	0.15
Exposed roof: FR	54.25	0.15

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
1, Windows (1)	4.86	West	0.7	1.3
2, Windows (1)	5.7	East	0.7	1.3
3, Roof windows (1)	1.8	South	0.7	1.3

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Not government-approved scheme	0.038 **(!)**	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.026 **(!)**	Not Provided

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E4: Jamb	Not government-approved scheme	0.028 **(!)**	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.16	Not Provided
External wall	E7: Party floor between dwellings (in blocks of flats)	Not government-approved scheme	0.07	Not Provided
External wall	E14: Flat roof	Not government-approved scheme	0.08	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.09	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.09	Not Provided
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.06	Not Provided
External wall	E25: Staggered party wall between dwellings	Not government-approved scheme	0.12	Not Provided
Roof	R1: Head of roof window	Not government-approved scheme	0.08	Not Provided
Roof	R2: Sill of roof window	Not government-approved scheme	0.06	Not Provided
Roof	R3: Jamb of roof window	Not government-approved scheme	0.08	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))		
Maximum permitted air permeability at 50Pa	*8 m^3/hm^2*	
Dwelling air permeability at 50Pa	2.5 m^3/hm^2, Design value **(!)**	OK
Air permeability test certificate reference	Not Provided	

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	350.0%
Emitter type	Radiators
Flow temperature	55°C
System type	
Manufacturer	
Model	
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	170 litres
Declared heat loss	1.2 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat and HW separately timed	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	*75 lm/W*	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	*1.5 W/(l/s)*	
Specific fan power	0.4 W/(l/s)	OK
Minimum permitted heat recovery efficiency	*73%*	
Heat recovery efficiency	94%	OK
Manufacturer/Model		
Commissioning	Not Provided / Not Provided	

9 Local generation	
Technology type: **Photovoltaic system (1)**	
Peak power	0.83 kWp
Orientation	South
Pitch	30°
Overshading	None or very little
Manufacturer	Not Provided
MCS certificate	

10 Heat networks
N/A

11 Supporting documentary evidence
N/A

12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed: Name:	Assessor ID: Date:	
b. Client Declaration		
N/A		