



THE BUILDING COMPLIANCE TEAM

REFERENCE: TBCT/23/10/DPH2/BL/ES

CLIENT: DPH2 LTD

ADDRESS: BURNAGE LANE, MANCHESTER, M19 1FE

DEVELOPMENT DETAILS: ERECTION OF A NEW BUILD MIXED USE DEVELOPMENT COMPRISNG 9 APARTMENTS AND COMMERCIAL SPACE

DATE: 11/10/2022

PRODUCED BY:

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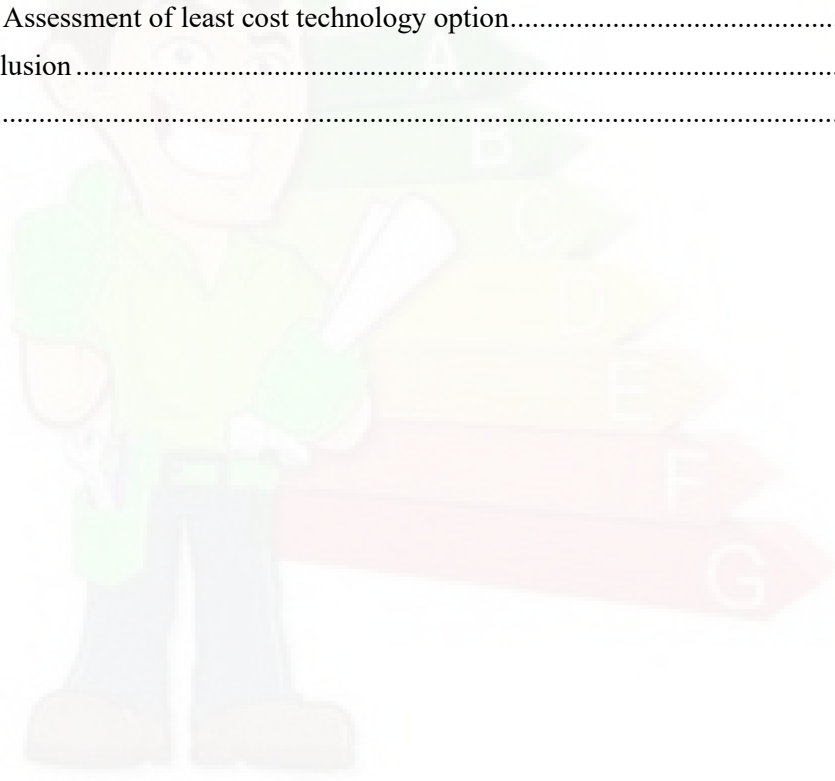
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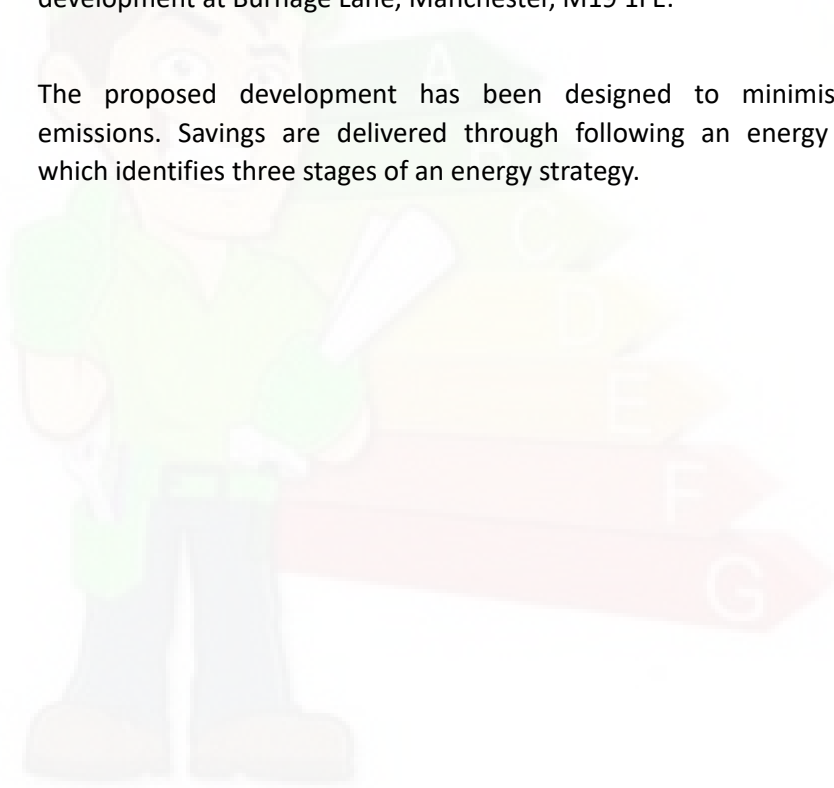


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1. General

This energy statement has been prepared to address the sustainability ratings and the provision of renewable energy within the Development as well as demonstrating how Manchester City Council Core Strategy Policies EN4 and EN6 will be met in association with the proposed mixed-use development at Burnage Lane, Manchester, M19 1FE.

The proposed development has been designed to minimise carbon emissions. Savings are delivered through following an energy hierarchy which identifies three stages of an energy strategy.



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2. Appendix A of the Core Strategy

Appendix A of the Core Strategy sets out a seven-step approach to demonstrating compliance with policies EN4 and EN6.

These criteria are set out individually below and responded to at each stage below the requirement. Associated calculations and reports can be found in the appendices at the end of this report.

2.1. A. Set out the baseline information

The baseline information should include the following:

- Proposed mix of uses
- Schedule of floorspace for each use
- Proposed phasing and anticipated timescale for the completed development The proposed servicing strategy for the development, by block, site or phase

The Development is a mixed-use development of 9 x apartments and 2 x Retail Units at Ground Floor.

A schedule setting out the approximate floor space and its use can be seen at table 1 below.

Name	Area	Use
Flat 151	69.56	Residential
Flat 152	92.55	Residential
Flat 153	52.8	Residential
Flat 154	55.33	Residential
Flat 155	81.08	Residential
Flat 250	78.45	Residential
Flat 251	65.71	Residential
Flat 252	52.8	Residential
Flat 253	53.08	Residential
Retail	415	Commercial

Table 1: Schedule of Floorspace and usage

It is anticipated that the development will be built out in one phase and subject to planning hope to be complete by 2025.



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2.2. B. Calculate the total energy demand of the completed development

Using the above baseline information, set out the projected future energy demand of the development, assuming the development is compliant with Part L of the Building Regulations 2010, and including the following:

Regulated emissions under Part L i.e. those associated with 'fixed' M&E plant such as space heating, ventilation, hot water and fixed lighting, and

Appendix A demonstrates the SAP Calculations and BRUKL Report for the proposed units and evidences their compliance with the Building Regulations 2010 including the updated Approved Document L 2021 (Volume 1 and 2).

2.3. C. Calculate the equivalent annual carbon emissions from the completed development

The carbon emissions should be calculated based on regulated energy use weighted to reflect the emissions factors for different fuels and energy sources.

The Baseline for carbon emissions in new residential buildings is expressed in the parameter of "TER", the Target Emission Rate of the proposed building when the notional dwelling specification is applied to the subject proposed dwelling. In order to achieve compliance, the "DER" (Dwelling Emission Rate) must be lower than the TER.

The same concept applies to on-domestic buildings; however, the DER is known as the BER (Building Emission Rate).

Appendix A shows the results of the SAP calculations and BRUKL report for the commercial aspect of the development and evidences the emission rates of all the units at the site.



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2.4. D. Apply the appropriate carbon emissions reduction target

Use the guidance below, headed 'Which Target applies to my Development?' to identify the appropriate carbon emissions reduction target for your development. Using this calculate the extent of carbon savings that need to be made.

Based on the “Which Target applies to my Development”, the residential and commercial aspects of the development would require a 15% increase on Part L 2010.

As a consequence of the reduction in dwelling emission rates sought by current building regulations (Part L 2021), the revised Policy EN 6 target CO₂ emission reductions are deemed by Manchester City Council to be a 9% improvement over the Building Regulation Part L1A (2013) compliance standard.

The 2021 Regulations are accepted as a 31% improvement on the standards of 2013.

The Core Strategy states, “Where the CO₂ emissions reduction required under any future revision to Part L of the building regulations becomes greater than the '% Minimum requirement', the reduction required under building regulations would apply”

It therefore follows that as both the dwellings and the commercial space are being developed in compliance with Approved Document L 2021 (see Appendix A), then by default they achieve the standards of the Core Strategy.



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2.5. E. Apply the energy hierarchy

The energy hierarchy should be applied in order to identify opportunities for carbon emissions reductions through design and specification of the development. Set out the carbon savings achieved by each measure. This should include consideration of how to minimise or even design-out electricity use associated with heating, ventilation and cooling, and how to influence energy used by future occupiers e.g. through the installation of Building Energy Management systems or smart metering.

The proposed development has been designed to minimise carbon emissions. Savings are delivered through following an energy hierarchy which identifies three stages of an energy strategy.

Use Less Energy via Energy Efficiency and Demand Reduction Measures (BE LEAN)

The following energy efficiency and demand reduction measures will be adopted:

- i) **Improve U-values of the external envelope.**
- ii) **Improve U-value of glazing.**
- iii) **Improve air permeability of the envelope.**
- iv) **Improve efficiency of the space heating.**
- v) **Use of energy efficient lighting.**

Supply Energy Efficiently via Decentralised Energy (BE CLEAN)

Decentralised energy is an efficient means of generating and distributing heat and power via communal based renewable energy technologies such as combined heat and power.

Due to the nature of the proposed development, where the resident will be responsible for their own servicing provision, central energy generation has been discounted.

Renewable Energy Technologies (BE GREEN)

Green technology is the utilisation of renewable machinery on site to reduce the need for energy demand on the grid.

The dwellings have all been modelled with an Air Source Heat Pump for Space and Water heating.



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2.6. F. Consider all appropriate low carbon, renewable and/or decentralised energy technologies

In order to achieve the overall carbon savings required, consider the range and/or mix of low carbon renewable and/or decentralised technologies that are available and appropriate for the type and location of the development. Set out the carbon savings achieved by each technology or mix of technologies and the associated cost of installing that technology.

Technologies that may be considered appropriate are listed below. This list is not exhaustive and other technologies may be identified by the developer and given consideration. Any proposed technology will need to be appropriate to the site location and surrounding uses.

CHP/district heating - If the development falls into the category of Target 1 a CHP/district heating feasibility study, encompassing buildings that could be connected in the surrounding area will be expected as part of the consideration of potential low carbon technologies

- Solar Hot Water (SHW)
- Photovoltaics (PV)
- Wind
- Ground Source Heat Pumps (GSHP)
- Air Source Heat Pumps (ASHP)
- Biomass heating
- Gas Combined Heat and Power (Gas CHP)
- Biomass Combined Heat and Power (Biomass CHP)
- Energy from Waste (EfW)
- Deep Bore Geothermal
- Fuel Cell technologies

Table 2 below demonstrates the thought process relating to a number of the main technologies referenced in the core development list above and demonstrates why ASHPs were chosen as the preferred choice.



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Technology Proposed	Consideration
CHP/District Heating	No District Heating Available - N/A
Solar Hot Water	Not adequate Roof Space to facilitate and still ensure dwellings will achieve TPER - N/A
Photovoltaics (PV)	
Wind	Not appropriate for the development - N/A
Ground Source Heat Pump (GSHP)	Not adequate permeable ground at development - N/A
Air Source Heat Pump	Deemed an appropriate and cost-effective solution
Biomass Heating	Would not achieve TPER for building regs - N/A
Gas CHP	Would not achieve TPER for building regs - N/A

Table 2: Consideration of Renewable Energy Technology

2.7. G. Assessment of least cost technology option

Following on from the above assessment, the identified target should be met using the technology mix which demonstrates the required carbon reductions at the least cost. Where there are no suitable local resources or opportunities, and a district heating network is not deemed viable, solutions to a shortfall in carbon reductions over and above that required to achieve 'carbon compliance' under Government proposals may be met through the use of off-site allowable solutions. (See below)

As set out above, the development will utilise Air Source Heat Pumps for the implementation of space and water heating.

3. Conclusion

This report demonstrates that this development has considered and addressed how the development would meet Core Strategy policies EN4 and EN6 and that addresses sustainability ratings and the provision of renewable energy within the development and having referred to Appendix A of the Core Strategy for guidance on preparing this statement, has demonstrated compliance with the Manchester City Council requirements.



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Appendix A

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 22 Nov 2023 14:00:15

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	70 m ²
Site Reference	01 Flat 151 Be Green	Plot Reference	01 Flat 151 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	9.23 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	3.72 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	48.19 kWh _{PE} /m ²		
Dwelling primary energy	39.58 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	18.9 kWh/m ²		
Dwelling fabric energy efficiency	16.6 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	W W (1.2)	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 ² K]	
Exposed wall: Walls (1)	12.18	0.18	
Exposed roof: Roof (1)	27.51	0.11	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W W, Window	11	West	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E14: Flat roof	Government-approved scheme	0.08	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	
External wall	E18: Party wall between dwellings	Government-approved scheme	0.06	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation

N/A

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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:00:34

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	93 m ²
Site Reference	02 Flat 152 Be Green	Plot Reference	02 Flat 152 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	8.6 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	3.4 kgCO ₂ /m ²	OK

1b Target primary energy rate and dwelling primary energy		
Target primary energy	44.76 kWh _{PE} /m ²	
Dwelling primary energy	35.99 kWh _{PE} /m ²	OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	22.3 kWh/m ²	
Dwelling fabric energy efficiency	19.5 kWh/m ²	OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	W S (1.2)	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 ² K]
Exposed wall: Walls (1)	20.72	0.18
Exposed roof: Roof (1)	46.12	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W S, Window	13.6	East	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E14: Flat roof	Government-approved scheme	0.08	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	
External wall	E18: Party wall between dwellings	Government-approved scheme	0.06	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation

N/A

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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:00:55

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	53 m ²
Site Reference	03 Flat 153 Be Green	Plot Reference	03 Flat 153 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	9.77 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	3.94 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	51.44 kWh _{PE} /m ²		
Dwelling primary energy	42.3 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	12.6 kWh/m ²		
Dwelling fabric energy efficiency	10.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	N/A	N/A	N/A
Windows, doors, and roof windows	1.6	1.2	W S (1.2)	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 ² K]
Exposed wall: Walls (1)	21.01	0.18

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W S, Window	5.7	South	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation

N/A

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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:01:09

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	55 m ²
Site Reference	04 Flat 154 Be Green	Plot Reference	04 Flat 154 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	11.03 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.14 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	57.99 kWh _{PE} /m ²		
Dwelling primary energy	44.17 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	22.0 kWh/m ²		
Dwelling fabric energy efficiency	18.1 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	N/A	N/A	N/A
Windows, doors, and roof windows	1.6	1.2	W S (1.2)	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 ² K]
Exposed wall: Walls (1)	26.66	0.18

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W S, Window	4.25	South	0.8	1.2
W E, Window	6.65	East	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation

N/A

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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:01:29

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	81 m ²
Site Reference	05 Flat 155 Be Green	Plot Reference	05 Flat 155 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	9.69 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	3.62 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	50.56 kWh _{PE} /m ²		
Dwelling primary energy	38.41 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	24.0 kWh/m ²		
Dwelling fabric energy efficiency	19.7 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.13	Heatloss Floor 1 (0.13)	OK
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	W S (1.2)	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 ² K]	
Exposed wall: Walls (1)	56.74	0.18	
Upper floor: Heatloss Floor 1, Heatloss Floor 1	8.86	0.13	
Exposed roof: Roof (1)	28.56	0.11	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W S, Window	13.8	South	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E20: Exposed floor (normal)	Government-approved scheme	0.32	
External wall	E21: Exposed floor (inverted)	SAP table default	0.32	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E14: Flat roof	Government-approved scheme	0.08	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation	
N/A	
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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:01:50

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	78 m ²
Site Reference	06 Flat 250 Be Green	Plot Reference	06 Flat 250 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	11.79 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.22 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	61.9 kWh _{PE} /m ²		
Dwelling primary energy	44.49 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	33.6 kWh/m ²		
Dwelling fabric energy efficiency	29.0 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	W W (1.2)	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 ² K]	
Exposed wall: Walls (1)	45.63	0.18	
Exposed roof: Roof (1)	78.45	0.11	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W W, Window	5.7	West	0.8	1.2
W N, Window	2.85	North	0.8	1.2
W E, Window	5.7	East	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E14: Flat roof	Government-approved scheme	0.08	
Party wall	P3: Intermediate floor between	SAP table default	0 (!)	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
	dwelling (in blocks of flats)			
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	
External wall	E18: Party wall between dwellings	Government-approved scheme	0.06	
Party wall	P4: Roof (insulation at ceiling level)	Government-approved scheme	0.12	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation	
N/A	
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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:08:27

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	66 m ²
Site Reference	07 Flat 251 Be Green	Plot Reference	07 Flat 251 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	11.01 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.13 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	57.75 kWh _{PE} /m ²		
Dwelling primary energy	43.84 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	26.4 kWh/m ²		
Dwelling fabric energy efficiency	23.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	W S (1.2)	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 ² K]	
Exposed wall: Walls (1)	28.87	0.18	
Exposed roof: Roof (1)	65.71	0.11	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W S, Window	4.25	South	0.8	1.2
W E, Window	9.5	East	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E14: Flat roof	Government-approved scheme	0.08	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E18: Party wall between dwellings	Government-approved scheme	0.06	
Party wall	P4: Roof (insulation at ceiling level)	Government-approved scheme	0.12	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation

N/A	
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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:09:00

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	53 m ²
Site Reference	08 Flat 252 Be Green	Plot Reference	08 Flat 252 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	11.16 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.29 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	58.95 kWh _{PE} /m ²		
Dwelling primary energy	45.74 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	19.9 kWh/m ²		
Dwelling fabric energy efficiency	16.5 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	W S (1.2)	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 ² K]	
Exposed wall: Walls (1)	21.01	0.18	
Exposed roof: Roof (1)	52.8	0.11	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W S, Window	5.7	South	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	
External wall	E14: Flat roof	Government-approved scheme	0.08	
Party wall	P4: Roof (insulation at ceiling level)	Government-approved scheme	0.12	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation	
N/A	
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 Array SAP 10 program, Array

Date: Wed 22 Nov 2023 14:09:21

Project Information			
Assessed By	Aharon Horwich	Building Type	Flat, Semi-detached
OCDEA Registration	EES/027284	Assessment Date	2023-11-22

Dwelling Details			
Assessment Type	As designed	Total Floor Area	53 m ²
Site Reference	09 Flat 253 Be Green	Plot Reference	09 Flat 253 Be Green
Address			

Client Details	
Name	A
Company	A
Address	A, A, A

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	12.58 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.55 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	66.44 kWh _{PE} /m ²		
Dwelling primary energy	48.39 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	27.4 kWh/m ²		
Dwelling fabric energy efficiency	22.4 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	W S (1.2)	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 ² K]	
Exposed wall: Walls (1)	43.27	0.18	
Exposed roof: Roof (1)	53.08	0.11	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W S, Window	8.5	South	0.8	1.2

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)	Government-approved scheme	0.05	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E7: Party floor between dwellings (in blocks of flats)	Government-approved scheme	0.07	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E25: Staggered party wall between dwellings	Government-approved scheme	0.06	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 (!)	
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15	
External wall	E14: Flat roof	Government-approved scheme	0.08	
Party wall	P4: Roof (insulation at ceiling level)	Government-approved scheme	0.12	

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	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	249.9%
Emitter type	Radiators
Flow temperature	35°C
System type	Air source heat pump
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	200 litres
Declared heat loss	1.4 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: N/A

Manufacturer	
Model	

7 Lighting

Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	100 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation

System type: N/A

Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation	
N/A	
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	

Project name

Commercial Units Burnage Lane -
Baseline

As designed

Date: Mon Oct 09 16:14:01 2023

Administrative information

Building Details

Address: Commercial Units, Burnage Lane,

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.5"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.5

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

Foundation area [m²]: 138.25The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.44
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3.33
Target primary energy rate (TPER), kWh _{pe} /m ² annum	36.9
Building primary energy rate (BPER), kWh _{pe} /m ² annum	35.59
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

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

Fabric element	U _{a-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.18	0.18	External Wall
Floors	0.18	0.13	0.13	Ground Floor
Pitched roofs	0.16	-	-	No pitched roofs in project
Flat roofs	0.18	0.11	0.11	Roof
Windows** and roof windows	1.6	1.2	1.2	W01
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	1	1	D01
Vehicle access & similar large doors	1.3	-	-	No vehicle access or similar large doors in project
High usage entrance doors	3	-	-	No high usage entrance doors in project

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

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

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

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

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

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	5

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	NO
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- Zone (2 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	4.5	-	-	-
Standard value	2.5*	3	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- New HWS Circuit

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0
Standard value	1	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
051 Retail Unit 1		100	100	-
052 Retail Unit 2		100	100	-

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?
051 Retail Unit 1	YES (+71%)	NO
052 Retail Unit 2	NO (-25%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	415	415
External area [m ²]	995	995
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	240	270
Average U-value [W/m ² K]	0.24	0.27
Alpha value* [%]	27.57	12.57

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

Building Use

% Area	Building Type
100	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
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	7.44	8.65
Cooling	2.58	1.9
Auxiliary	0	0
Lighting	11.87	12.63
Hot water	1.61	1.61
Equipment*	20.26	20.26
TOTAL**	23.51	24.79

* 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
<i>Displaced electricity</i>	<i>0</i>	<i>0</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	118.48	118.26
Primary energy [kWh _{PE} /m ²]	35.59	36.9
Total emissions [kg/m ²]	3.33	3.44

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	74.5	44	7.8	2.7	0	2.64	4.5	2.64	4.5
Notional	15.1	31.7	1.6	2	0	2.64	4.4	----	----

Key to terms

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

Project name

Commercial Units Burnage Lane - Be Green

As designed

Date: Mon Oct 09 16:25:02 2023

Administrative information

Building Details

Address: Commercial Units, Burnage Lane,

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.5"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.5

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

Foundation area [m²]: 138.25The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.44
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	2.94
Target primary energy rate (TPER), kWh _{pe} /m ² annum	36.9
Building primary energy rate (BPER), kWh _{pe} /m ² annum	31.62
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

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

Fabric element	U _{a-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.18	0.18	External Wall
Floors	0.18	0.13	0.13	Ground Floor
Pitched roofs	0.16	-	-	No pitched roofs in project
Flat roofs	0.18	0.11	0.11	Roof
Windows** and roof windows	1.6	1.2	1.2	W01
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	1	1	D01
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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	5

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	NO
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- Zone (2 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	4.5	-	-	-
Standard value	2.5*	3	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- New HWS Circuit

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0
Standard value	1	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
Standard value	95	80	0.3
051 Retail Unit 1	100	100	-
052 Retail Unit 2	100	100	-

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?
051 Retail Unit 1	YES (+71%)	NO
052 Retail Unit 2	NO (-25%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	415	415
External area [m ²]	995	995
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	240	270
Average U-value [W/m ² K]	0.24	0.27
Alpha value* [%]	27.57	12.57

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

Building Use

% Area	Building Type
100	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
	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
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	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	4.91	8.65
Cooling	2.58	1.9
Auxiliary	0	0
Lighting	11.87	12.63
Hot water	1.61	1.61
Equipment*	20.26	20.26
TOTAL**	20.97	24.79

* 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
<i>Displaced electricity</i>	<i>0</i>	<i>0</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	118.48	118.26
Primary energy [kWh _{PE} /m ²]	31.62	36.9
Total emissions [kg/m ²]	2.94	3.44

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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	74.5	44	5.2	2.7	0	4	4.5	4	4.5
Notional	15.1	31.7	1.6	2	0	2.64	4.4	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
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