EAL CONSULT BUILDING SUSTAINABILITY SINCE 2008

ENVIRONMENTAL STANDARDS STATEMENT

LANGDALE MEWS

PROPERTY ADDRESS

LANGDALE MEWS
LANGDALE AVE
LEVENHULME
M19 3NT

DATE

June 2025

PREPARED BY

EAL Consult

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1. EXECUTIVE SUMMARY

Site description

This Energy and Sustainability Assessment has been prepared to support the planning application for the erection of a three storey side extension with accommodation in the roof to provide three flats (3 x 1 bed Class C3) with associated bin store, parking area and outdoor pergola for residents

Strategy

The strategy highlights how the proposed development will promote sustainability throughout both design and operation and responds to the UK Planning and regulatory framework, National Planning Policy Framework 2024 and Manchester's Local Plan Strategic Policies, summarising how the relevant targets will be addressed and achieved.

Energy Hierarchy

In accordance with the Energy Hierarchy, this statement outlines an overall commitment to reducing energy consumption under occupancy through the adoption of a 'Fabric First' principle, which will seek to enhance insulation standards and improved heating and lighting efficiencies in comparison to the standard requirements of Approved Document Part L 2021. The viability of district heating will be explored. Further carbon emission reduction will be achieved by using renewable technologies.

- ***Be 'Lean':*** Passive design principles including a high level of insulation and reduced air permeabilty to deliver Part L compliant Building in absence of renewable technologies. It will achieve **18%** reduction in carbon emissions over Part L 2021 baseline.
- ***Be 'Clean':*** district heating was deemed not viable for this project
- ***Be 'Green':*** Solar Photovoltaic Panels have been proposed for the specific scheme and will deliver a further **16%** reduction in regulated carbon emissions over Part L 2021 baseline

Energy Effcicency & Carbon Reduction

- This report demonstrates that the proposed development by incorporating the measures above can achieve an **overall** carbon emission reduction of **34%**

Overheating

The development proposal will minimise adverse impacts on the urban heat island through design, layout, orientation and materials.

Ventilation

The development utilises natural ventilation in the building.

Sustainable Design:

- Natural lighting is incorporated to prevent excessive demand for artificial lighting
- The development will not increase the air pollution of the area
- Total internal water consumption will not exceed 105 litres/person/day
- All contractors should sign up to the nationally recognised Considerate Constructors Scheme
- Designated space for waste and recycling facilities
- Low Flood Risk area

Reducing Waste and Supporting the Circular Economy:

- Minimising the use of virgin materials during construction by recycling and reusing where feasible.
- Promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible
- Encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products
- Low waste benchmark levels will be targeted during construction with requirements identifying that the diversion of waste from landfill is to be achieved by the contractor.

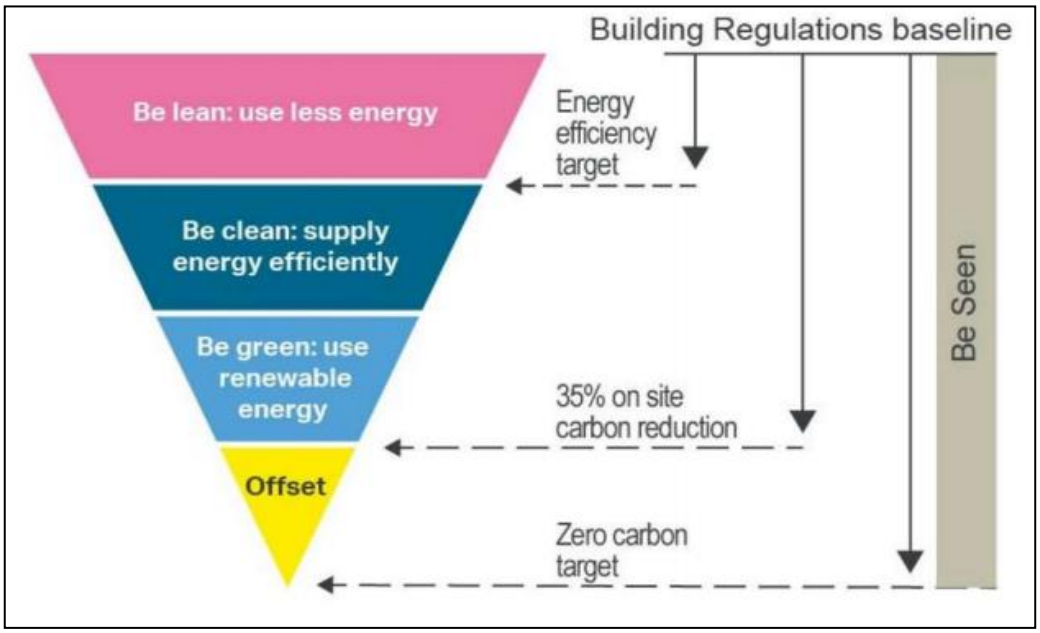
2. METHODOLOGY

This energy assessment outlines the energy demand from the development together with the associated CO_2 emissions, using Building Regulations Part L 2021 as a baseline. It demonstrates how the emissions from energy use in the development will be reduced through energy efficiency measures.

The proposed scheme is required to achieve carbon emission reduction principles in accordance with the UK Planning and regulatory framework.

The methodology employed to determine the potential CO_2 savings is in accordance with the three-step Energy Hierarchy.

Figure 1: The Energy Hierarchy



- ***Be 'Lean'*** **-** Improve the energy efficiency of the scheme;
- ***Be 'Clean'*** **-** Supply as much of the remaining energy requirement with low carbon; technologies such as district heating if available or combined heat and power (CHP); and
- ***Be 'Green'*** **-** Offset a proportion of the remaining carbon dioxide emissions by using renewable technologies.
- ***Be 'Seen'*** - monitor, verify and report on post-construction energy performance

The government approved Standard Assessment Procedure (SAP) methodology software (2021) has been used to determine the CO_2 emissions and energy requirements. It compares CO_2 emissions from regulated energy use (DER) with those of an equivalent dwelling built to Part L 2021 (TER), a notional dwelling of the same size and shape.

Opportunities for incorporating features into the development that contribute to the objectives of sustainable development were explored during the design process, to ensure that where possible, the proposals achieve best practice.

3. PLANNING POLICY CONTEXT

National Planning Policy Framework (NPPF) 2024

Emphasised the concept of sustainable development by encouraging local authorities to adopt proactive strategies to mitigate and adapt to climate change. It recommends the move to a low carbon future by:

- Avoiding increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and
- Contributing to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.
- To help increase the use and supply of renewable and low carbon energy and heat, plans should:
    - provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);
    - consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and
    - identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for colocating potential heat customers and suppliers.
- New updates emphasised that when determining planning applications, local planning authorities should give significant weight to the need to support energy efficiency and low carbon heating improvements to existing buildings, both domestic and non-domestic.

Core Strategy Development Plan Document Adopted 11th July 2012 including 2024 amendments
Policy EN4 Reducing CO2 Emissions by Enabling Low and Zero Carbon Development

The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO2 emissions, and rising fossil fuel prices, through the following actions:

- Wherever possible new development and retrofit projects, including energy generation plant, must be located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.
- Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.
- Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing/potential decentralised energy schemes.
- The use of building materials with low embodied carbon in new development and refurbishment schemes.

Policy EN6: Target Framework for CO2 Reductions from Low or Zero Carbon Energy Supplies
Applications for residential developments of 10 or more units, and all other developments over 1,000 sqm will be expected as a minimum to meet the target unless this can be shown not to be

viable. This should be demonstrated through energy statemen, submitted as part of the Design and Access Statement. Such a statement will be expected to set out the projected regulated energy demand and associated CO2 emissions for all phases of the development.

The energy statement will need to be submitted at the outset of any proposed development (outline application or before). Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees, and waterways to contribute to compliance with CO2 mitigation, subject to the energy statement including evidence such as modeling to demonstrate compliance.

Guidance on what the energy statement should contain and how to decide which target applies to a development proposal is provided in Appendix A.

Provisional timetable for Building Regulation CO2 reduction targets over 2006 compliant building

Table 12.3

Year	CO2 reduction target over 2006 compliant building			
	Residential (subsidised)	Residential (private)	Non-domestic (subsidised)	Non-domestic (private)
2006	25%	0%	0%	0%
2010	44%	25%	25%	25%
2013	Zero carbon	44%	44%	44%
2016		Zero carbon	100%	100%
2018			Zero carbon	100%
2019				Zero carbon

Policy EN8 Adaptation to Climate Change

All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:

- Reduction in urban heat island effect through the use of Green Infrastructure such as green roofs, green walls, increased tree cover and waterways
- The need to control overheating of buildings through passive design

Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO2 mitigation under Policy EN6, subject to sufficient evidence to quantify their contribution to compliance.

PLACES FOR EVERYONE JOINT DEVELOPMENT PLAN DOCUMENT FOR BOLTON, BURY, MANCHESTER, OLDHAM, ROCHDALE, SALFORD, TAMESIDE, TRAFFORD AND WIGAN 2022 to 2039 ADOPTED 21 MARCH 2024

Policy JP-S2: Carbon and Energy

The aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions, will be supported through a range of measures including:

1. Promoting the retrofitting of existing buildings with measures to improve energy efficiency and generate renewable and low carbon energy, heating and cooling;
2. Promoting the use of life cycle cost and carbon assessment tools to ensure the long-term impacts from development can be captured;
3. Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities;

4. Increasing the range of nature-based solutions including carbon sequestration through the restoration of peat-based habitats, woodland management, tree planting and natural flood management techniques;
5. An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;
    a. a. Be net zero carbon(29) which applies:
    - from adoption – to regulated operational carbon emissions;
    - from 2028 – to all emissions 'in construction'.

    From 2025 development should also calculate and minimise carbon emissions from unregulated emissions alongside regulated emissions.
    Development proposals should set out how this has been achieved in an energy statement in accordance with the energy hierarchy, which in order of importance seeks to:
    i. Minimise energy demand;
    ii. Maximise energy efficiency;
    iii. Use renewable energy;
    iv. Use low carbon energy; and
    v. Utilise other energy sources.

    From 2025 any residual carbon emissions that cannot be fully mitigated on-site should be offset, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund.
    As an interim measure, development should be consistent with the 2022 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies.
    b. Incorporate adequate electric vehicle charging points, in line with Part S of the Building Regulations, unless superseded by relevant Local Plan policies, to future proof for the likely long-term demand, taking account of the potential maximum energy demand for the site;
    c. Where practicable, prioritise connection to a renewable energy/heating/cooling network in the first instance or a low carbon energy/heating/cooling network that is adaptable to non-fossil fuels at a later date;
    d. In residential developments, achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation, in accordance with Table 5.1.

    For renewable energy generation priority should be given to PV installation where technically feasible, alternative technologies will be appropriate where the equivalent generation is evidenced.
    e. For non-residential developments, achieve at least BREEAM excellent standard (or equivalent) for the 'Ene 01 – reduction of energy use and carbon emissions' category rising to 'BREEAM outstanding' equivalent for ENE 01 from 2028.
    f. Include a detailed energy statement to demonstrate via site relevant evidence how the development has sought to maximize reductions in carbon emissions in line with relevant policy targets, including the minimisation of overheating risks and appropriate measures for post occupancy evaluation. Whole life cycle emissions should be considered where possible.

Policy JP-S6: Resource Efficiency

The achievement of a circular economy and a zero-waste economy will play a key role in meeting Greater Manchester's ambition of becoming a leading green city region by 2038. The following measures will help achieve this:

1. Development and implementation of the Zero Waste Strategy for Greater Manchester which promotes overall reduction in the level of waste produced and supports resource efficiency within the Plan area in order to gain the maximum value from the things we produce;
2. Recognition of the role of existing infrastructure in managing our waste and protecting such facilities to ensure adequate waste management capacity is maintained; and
3. ';Using sustainable design and construction techniques to reduce carbon emissions, adapt and future proof to the impact of climate change, reduce and recycle waste and minimise water use.

4. ENERGY STRATEGY

The Energy strategy for the proposed development is based on the Building Regulations Part L; it adopts a set of principles to guide design and decisions regarding energy, balanced with the need to optimise environmental and economic benefits. It seeks to incorporate energy efficiency through the approach detailed below.

The following tables demonstrate the average carbon emissions and savings.

Table 1. Carbon Dioxide emissions after each stage of the Energy Hierarchy

	Regulated Carbon dioxide emissions (Tonnes CO_2 per annum)	
	Regulated	**Unregulated**
Baseline: Part L 2021 of the Building Regulations Compliant Development	1.02	
After Energy Demand Reduction (Be Lean)	0.83	
After Heat Network Connection (Be Clean)	0.83	
After Renewables (Be Green)	0.67	

Table 2. Carbon Dioxide Savings from each stage of the Energy Hierarchy

	Regulated Carbon dioxide savings	
	Tonnes CO_2 per annum	**%**
Be Lean: Savings from Energy Demand Reduction	0.19	18
Be Clean: Savings from Heat Network	0	0
Be Green: Savings from Renewable Energy	0.16	16
Cumulative on-site savings	0.35	34

a. Baseline Model

A baseline model is run with Building Regulations Part L target values as set out in SAP 10.2 Appendix R. This baseline model is then used in the Energy Strategy process in comparison to the Be 'Lean', Be 'Clean' and Be 'Green' scenarios of the Energy Hierarchy, to establish the regulated CO^2 emissions from the development.

The baseline model used for this project assumed that any heating and hot water supply would be provided by a gas boiler and any active cooling would be provided by electrically powered equipment. The comparative Be 'Lean' model assumes the same heating strategy.

b. Be 'Lean' - Demand Reduction

The building fabric performance and engineering systems have been optimised in order to use less energy prior to the inclusion or consideration of Low and Zero Carbon (LZC) Technology.

Through passive design measures, efficient building fabric and engineering systems the building is estimated to achieve **18%** reduction in annual regulated CO_2 emissions over Part L benchmark, therefore demonstrating compliance with Building Regulations Through passive means alone without the utilisation of renewable technologies.

Passive Design Measures

Fabric Performance - The fabric performance values aim to reduce unwanted heat loss and heat gains, whilst maintaining a comfortable internal environment.

The heat loss of different building elements is dependent upon their U –value. A building with low U values provides better levels of insulation and reduced heating demand.

The development will incorporate high levels of insulation and efficient glazing; thereby reduce demand for space heating. The table below shows the U values for the development and the associated improvements over Building Regulations.

Table 3. Energy Efficient Design Specification

Element	Building Regulations 2021 Standard	Specification
Wall	0.18 W/m²k	0.12 W/m²k
Roof	0.11 W/m²k	0.11 W/m²k
Floor	0.13 W/m²k	0.11 W/m²k
Windows and Doors	1.2 W/m²k	1.2 W/m²k

Air Permeability – designed to achieve an air permeability score of 5

Efficient Lighting and Controls - Throughout the development natural lighting will be optimised. The development will also incorporate low energy light fittings throughout. All light fittings will be specified as low energy lighting and will accommodate LED luminaries only.

Ventilation - The use of natural ventilation is proposed for the dwellings.
Space Heating & Cooling - Space heating will be provided by radiators powered by a combi boiler

Domestic Hot Water (DHW) system – domestic hot water is supplied for the dwelling via a 80l hot water cylinder.

c. Be 'Clean' - Supply Energy Efficiently

The Be Clean step of the energy hierarchy refers to the use of 'Clean energy supply'. This includes, but is not limited to, the use of Combined Heat and Power (CHP) and District Heat Networks.

District Heating and Cooling

There is no existing or planned heat and energy network in the vicinity and the site does not fall into an opportunity area with decentralised energy potential.

Community heating and Combined Heat and Power (CHP system)

CHP systems are usually needed where there is a large heat demand (schemes with more than 100-150 dwellings), usually resulting from the building(s) being in continuous use, or through specific heating requirements such as a swimming pool. Community (or district) heating involves using a central boiler plant (or other heat sources) to heat a number of buildings through a network of well-insulated underground pipes. This system is not considered appropriate for this development

In light of the small scale of the proposed development, it is apparent that the use of CHP is also technically and financially unviable in this instance.

Site-wide communal system/network and design for district network connection

In light of the small scale of the proposed development and it is location; it is apparent that the use a heatpump fed site-wide network is technically and financially unviable.

d. Be 'Green' - Renewable Energy

Once energy demand reduction measures have been applied, methods for generating low and zero carbon energy can be assessed. The following renewable technologies can be considered for the project: Biomass, Water source heat pump, air source heat pump, Wind energy and solar photovoltaic panels.

Table 4. Renewable Technologies Feasibility Table

Technology	Pros	Cons
Biomass Heating A biomass system designed for wood pellets, which have a high-energy content, would fuel this development. 	• Less volume of storage • Less maintenance and produce considerably less ash residue	• Nox Emissions which may impacts • High Costs • Not suitable for the project
Ground Source Heat Pump It circulates a mixture of water and antifreeze around a loop of pipe, called a ground loop, which is buried in the garden. Heat from the ground is absorbed into the fluid and passes through a heat exchanger into the heat pump 	• Use all through the year	• High Costs • Not suitable for this project

Air Source Heat Pump They are an efficient and environmentally-friendly way of heating using air drawn freely from the atmosphere. They operate rather like a refrigerator in reverse, absorbing heat from the air into a working fluid which is passed into a compressor where its temperature is increased before it is transferred into the heating and hot water circuits of the building	• Can generate less CO_2 than conventional heating systems. • Cheaper • Provides heating and hot water • Less maintenance • Can be used as air-conditioning in the summer	• Needs electricity • Can be noisy
Wind Turbines Wind turbines are available in various sizes from large rotors able to supply whole communities to small roof or wall-mounted units for individual dwellings. 	• Cheaper • Less CO_2	• Local wind speeds in the area is likely to be below the level generally required for investment in large wind turbines. • Noise and signal interference. • Detrimental aesthetic impact
Solar Photovoltaic Panels (PV) Photovoltaic panels extract the energy of the sun to generate electricity. They operate most efficiently when oriented to the south and are inclined to about 35 degrees. 	• Cheaper • Less CO_2 • No input power in order to generate electricity.	

Renewable Technologies Feasibility Review Conclusion

The renewable energy sources that have been reviewed for this project are Biomass Heating, Ground Source Heat Pump, Air Source Heat Pump, Domestic Wind Turbine and Solar Photovoltaic Panels (PV).

On review of the above technologies, it has been concluded that the use of solar PV panels are to be incorporated in the design because it achieves a CO_2 percentage reduction of **16%** contributing to an overall reduction of **34%** in carbon emissions.

Table 5. Photovoltaic Panels

System size	Orientatiom	Battery	Connection
2 kWp	South West	2kWh storage and diverter	Multi-dwelling

5. SUSTAINABILITY STRATEGY

a. Sustainable Design

The proposed project incorporates sustainable design and construction measures capable of mitigating and adapting to climate change to meet future needs. This section details site-specific initiatives which demonstrate how the project aims to meet the sustainability objectives set out in the National Planning Framework 2024.

Materials Efficiency

Materials can have a significant impact on environmental performance, both in construction but also ongoing use. Materials used for the building will have lower environmental impacts over their lifecycle. This applies to the materials used in the external walls, roof and glazing. This extends to elements of the materials category such as the basic building materials (internal walls) and the finishing elements (fascia, skirting, and furniture).

b. Overheating Strategy

Minimise Heat Generation Through Energy Efficient Design

Through the use of passive and active design measures, the design team have enabled the development to require less energy through the use of optimised insulation, cross ventilation, improved window u-values, higher air tightness and reduced cold bridging.

Daylight

The design of the development has taken into consideration day lighting to habitable spaces to improve the wellbeing of occupants. Good levels of daylight will offer occupants a pleasant and highly valued connection to the outdoors and plenty of natural light. It will also reduce the use of artificial lighting and therefore energy use. All light fittings will be specified as low energy lighting. No external lighting is required. The location and orientation of windows help to create a design that avoids overheating in the summer.

Figure 4. Internal layout



c. Water Efficiency

Water: Water Efficiency

In domestic and non-domestic buildings, the demand for water can be reduced as much as 50% using a variety of simple and innovative strategies that are integrated into the plumbing and mechanical systems. In order to reduce water consumption the proposed development will include efficient fixtures with low flow rates. Total internal water consumption will not exceed 105 litres/person/day.

Table 6. Water Fittings Standards

Schedule Appliance Water Consumption		
Appliance	**Flow rate or Capacity**	**Total Litres**
WC	Dual flush WC 4/2.6 litre	14.72
Basin	1.7 litres/min	5.98
Shower	8 litres/minute flow	24.00
Bath	160 litres	25.60
Sink	4 litres/min	14.13
W/machine	Default used	16.66
Dish Washer	Default used	3.90
		104.99

d. Pollution: Light, Air and Noise

Light

Light pollution can best be described as artificial light that is allowed to illuminate or intrude upon areas not intended to be lit. Light in the wrong place at the wrong time can be intrusive.
Intrusive light is over bright or poorly directed lights shining onto neighbouring property which affect the neighbours' right to enjoy their property. Therefore, the proposal will incorporate lighting measures in order to avoid causing a nuisance.

Air and Noise

The layout of the development can provide good internal air quality for habitable areas but not too much so as to waste heat.

The use of openable windows will create horizontal airflow. By achieving a good naturally ventilated building the energy demand for air conditioning and mechanical ventilation will thereby be eliminated within the development.

The development will not increase the air pollution of the area by reducing as a start, its energy use, which in turn will reduce emissions that lead to air pollution.
Other measures will include:

a. Use of eco-friendly building materials
b. Non-toxic paints
c. Installation of energy efficient appliances and devices
d. Use of renewable technologies

e. Waste Management

Considerate Construction

All contractors would be required to sign up to the nationally recognised Considerate Constructors Scheme which requires, amongst other things that dust emissions, potential noise pollution, impacts on water quality and the potential for ground contamination are minimised during demolition and construction. The Contractor would also be obliged to adhere to a site-specific Code of Construction Practice to reduce potential nuisance effects.

Resource efficiency

- Pre-demolition audit to be carried out and target benchmark of ≤ 11.1 tonnes of construction waste per 100m^2;

Diversion of waste from landfill

- Where possible, segregation of recyclable and non-recyclable material will be employed for all waste generated throughout the construction process. Furthermore, material will be re-used on-site where feasible;
- Pre-fabrication of materials/elements such as bathroom pods, pipework and riser materials will be considered;
- Reusable packing solutions with key product manufacturers will be explored at the earliest opportunity. Solutions may include flat pallets, bulk bags, steel stillages and returnable cable drums;
- Construction waste – minimum 80% diversion from landfill rate;
- Demolition waste – minimum 90% diversion from landfill rate;

Operational Waste

Target diversion from landfill rate to be set.

A space for reuse and recycling has been included at the ground floor unit for the residents exclusive use.

f. Flood Risk

The development site is located in a Low Flood Risk Area on the Environment Agency Flood Risk Map.

g. Sustainable Procurement

It is expected that all timber used in the development will come from a legal Source (FSC Scheme). At least 80% of the building materials will be responsibly sourced and will use suppliers who can provide an EMS certificate or equivalent. Materials rated with an A or B in the BRE Green Guide to Specification will be preferred.

Other measures will be implemented:

- The reuse of existing materials from the demolition of existing buildings
- At least 20% of the total value of materials used should derive from recycled and reused content in the products and materials selected;
- Steel will have a high recycled content;
- Concrete will have a Ground Granulated Blast Furnace Slag (GGBS) value of 50%.

h. Biodiversity and Green Infrastructure

The existing site has very low biodiversity value, with mostly sealed surfaces and some grassy area to the north. The extension footprint extends on to some of the existing grass, however the proposal includes new grass in front of the existing building as well as new perimeter shrub planting. Therefore, there will be an overall improvement in biodiversity on site.

6. CONCLUSION

The development has been designed to exceed Part L building regulations requirements. In line with the national and local policies, regulated CO_2 emissions from the development will be reduced by **34%** from the notional emissions once energy efficiency measures and lean measures are taken into account.

The use of solar photovoltaic panels are to be incorporated in the design because they achieve a CO2 percentage reduction of **16%** contributing to the overall reduction of **34%** in carbon emissions. The remainder is made up from a fabric first approach with U-values outlined in the specification column of Table 3 on Page 11 of this report.

An appraisal of the proposed development has been undertaken against key sustainability objectives identified from relevant policy guidance. The framework for the appraisal was guided by the National Plan. This process has ensured that the development responds to the sustainable development objectives that are relevant to the area. Key sustainability initiatives in ecology, waste management, water, health and wellbeing, materials, pollution and Surface water management have been incorporated in the design of the proposed Development.

7. APPENDIX

A. SAP Calculations

i. Baseline

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 11 Jun 2025 10:03:01

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	41 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Baseline Apartment 1
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*17.86 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	23.97 $kgCO_2/m^2$	**FAIL**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*95.71 kWh_{PE}/m^2*	
Dwelling primary energy	132.75 kWh_{PE}/m^2	**FAIL**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*40.3 kWh/m^2*	
Dwelling fabric energy efficiency	62.5 kWh/m^2	**FAIL**

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*	0.18	Walls (1) (0.18)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.17	Flat 1 GF (0.17)	**OK**
Roofs	*0.16*	N/A	N/A	**N/A**
Windows, doors, and roof windows	*1.6*	1.14	North East (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^2K]**
Exposed wall: Walls (1)	28.8002	0.18
Sheltered wall: Walls (2)	8.57	0.16
Party wall: Party Wall (1)	16.22	0 **(!)**
Ground floor: Flat 1 GF, Flat 1 GF	40.76	0.17

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1 **(!)**
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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)	SAP table default	1	IG Lintels

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	SAP table default	0.1	
External wall	E4: Jamb	SAP table default	0.1	
External wall	E5: Ground floor (normal)	SAP table default	0.32	
External wall	E16: Corner (normal)	SAP table default	0.18	
External wall	E18: Party wall between dwellings	SAP table default	0.24	
External wall	E7: Party floor between dwellings (in blocks of flats)	SAP table default	0.28	
External wall	E17: Corner (inverted - internal area greater than external area)	SAP table default	0 **(!)**	
Party wall	P1: Ground floor	SAP table default	0.32	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.7%
Emitter type	Radiators
Flow temperature	55°C
System type	Combi boiler
Manufacturer	Vaillant Group UK
Model	ecoTEC plus 832 H combi A
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

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

6 Controls	
Main heating 1 - type: Programmer, room thermostat, and TRVs	
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	75 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 11 Jun 2025 10:03:19

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	41 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Baseline Apartment 2
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*15.46 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	20.54 $kgCO_2/m^2$	**FAIL**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*82.82 kWh_{PE}/m^2*	
Dwelling primary energy	114.27 kWh_{PE}/m^2	**FAIL**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*29.4 kWh/m^2*	
Dwelling fabric energy efficiency	48.1 kWh/m^2	**FAIL**

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*	0.18	Walls (1) (0.18)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	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*	1.14	North East (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^2K]**
Exposed wall: Walls (1)	28.8002	0.18
Sheltered wall: Walls (2)	8.57	0.16
Party wall: Party Wall (1)	16.22	0 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1 **(!)**
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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)	SAP table default	1	
External wall	E3: Sill	SAP table default	0.1	
External wall	E4: Jamb	SAP table default	0.1	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E16: Corner (normal)	SAP table default	0.18	
External wall	E18: Party wall between dwellings	SAP table default	0.24	
External wall	E7: Party floor between dwellings (in blocks of flats)	SAP table default	0.28	
External wall	E17: Corner (inverted - internal area greater than external area)	SAP table default	0 **(!)**	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.7%
Emitter type	Radiators
Flow temperature	55°C
System type	Combi boiler
Manufacturer	Vaillant Group UK
Model	ecoTEC plus 832 H combi A
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

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

6 Controls	
Main heating 1 - type: Programmer, room thermostat, and TRVs	
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	75 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:	Assessor ID:
Name:	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 11 Jun 2025 10:03:35

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	82 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Baseline Apartment 3
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*10.85 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	15.03 $kgCO_2/m^2$	**FAIL**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*57.6 kWh_{PE}/m^2*	
Dwelling primary energy	84.29 kWh_{PE}/m^2	**FAIL**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*23.6 kWh/m^2*	
Dwelling fabric energy efficiency	38.1 kWh/m^2	**FAIL**

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*	0.18	Walls (1) (0.18)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	N/A	N/A	**N/A**
Roofs	*0.16*	0.1	Roof (1) (0.11)	**OK**
Windows, doors, and roof windows	*1.6*	1.14	North East (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^2K]**
Exposed wall: Walls (1)	36.5402	0.18
Sheltered wall: Walls (2)	8.57	0.16
Party wall: Party Wall (1)	15.54	0 **(!)**
Exposed roof: Roof (1)	9.43	0.11
Exposed roof: Roof (2)	43.36	0.1 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1 **(!)**
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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)	SAP table default	1	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	SAP table default	0.1	
External wall	E4: Jamb	SAP table default	0.1	
External wall	E16: Corner (normal)	SAP table default	0.18	
External wall	E18: Party wall between dwellings	SAP table default	0.24	
External wall	E7: Party floor between dwellings (in blocks of flats)	SAP table default	0.28	
External wall	E17: Corner (inverted - internal area greater than external area)	SAP table default	0 **(!)**	
External wall	E6: Intermediate floor within a dwelling	SAP table default	0.14	
External wall	E11: Eaves (insulation at rafter level)	SAP table default	0.15	
External wall	E13: Gable (insulation at rafter level)	SAP table default	0.25	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.7%
Emitter type	Radiators
Flow temperature	55°C
System type	Combi boiler
Manufacturer	Vaillant Group UK
Model	ecoTEC plus 832 H combi A
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

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

6 Controls	
Main heating 1 - type: Programmer, room thermostat, and TRVs	
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	75 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	

ii. Be Lean

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 11 Jun 2025 10:03:53

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	41 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Be Lean Apartment 1
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*17.86 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	18.03 $kgCO_2/m^2$	**FAIL**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*95.71 kWh_{PE}/m^2*	
Dwelling primary energy	100.77 kWh_{PE}/m^2	**FAIL**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*40.3 kWh/m^2*	
Dwelling fabric energy efficiency	38.0 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*	0.15	Walls (1) (0.15)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.1	Flat 1 GF (0.1)	**OK**
Roofs	*0.16*	N/A	N/A	**N/A**
Windows, doors, and roof windows	*1.6*	1.14	North East (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^2K]**
Exposed wall: Walls (1)	28.8002	0.15
Sheltered wall: Walls (2)	8.57	0.14 **(!)**
Party wall: Party Wall (1)	16.22	0 **(!)**
Ground floor: Flat 1 GF, Flat 1 GF	40.76	0.1 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1 **(!)**
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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	0.065	IG Lintels

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Not government-approved scheme	0.002 **(!)**	Kingspan Kooltherm
External wall	E4: Jamb	Not government-approved scheme	0.015 **(!)**	Kingspan Kooltherm
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.041	Kingspan Kooltherm
External wall	E16: Corner (normal)	Not government-approved scheme	0.039 **(!)**	Kingspan Kooltherm
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.02 **(!)**	Kingspan Kooltherm
External wall	E7: Party floor between dwellings (in blocks of flats)	SAP table default	0.28	
External wall	E17: Corner (inverted - internal area greater than external area)	SAP table default	0 **(!)**	
Party wall	P1: Ground floor	SAP table default	0.32	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.7%
Emitter type	Radiators
Flow temperature	55°C
System type	Combi boiler
Manufacturer	Vaillant Group UK
Model	ecoTEC plus 832 H combi A
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

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

6 Controls	
Main heating 1 - type: Programmer, room thermostat, and TRVs	
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	75 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 11 Jun 2025 10:04:07

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	41 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Be Lean Apartment 2
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*15.46 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	17.48 $kgCO_2/m^2$	**FAIL**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*82.82 kWh_{PE}/m^2*	
Dwelling primary energy	97.84 kWh_{PE}/m^2	**FAIL**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*29.4 kWh/m^2*	
Dwelling fabric energy efficiency	35.6 kWh/m^2	**FAIL**

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*	0.15	Walls (1) (0.15)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	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*	1.14	North East (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^2K]**
Exposed wall: Walls (1)	28.8002	0.15
Sheltered wall: Walls (2)	8.57	0.14 **(!)**
Party wall: Party Wall (1)	16.22	0 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1 **(!)**
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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	0.065	IG Lintels
External wall	E3: Sill	Not government-approved scheme	0.002 **(!)**	Kingspan Kooltherm

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E4: Jamb	Not government-approved scheme	0.015 **(!)**	Kingspan Kooltherm
External wall	E16: Corner (normal)	Not government-approved scheme	0.039 **(!)**	Kingspan Kooltherm
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.02 **(!)**	Kingspan Kooltherm
External wall	E7: Party floor between dwellings (in blocks of flats)	SAP table default	0.28	
External wall	E17: Corner (inverted - internal area greater than external area)	SAP table default	0 **(!)**	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.7%
Emitter type	Radiators
Flow temperature	55°C
System type	Combi boiler
Manufacturer	Vaillant Group UK
Model	ecoTEC plus 832 H combi A
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

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

6 Controls	
Main heating 1 - type: Programmer, room thermostat, and TRVs	
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	75 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 11 Jun 2025 10:04:31

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	82 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Be lean Apartment 3
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*10.85 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	12.69 $kgCO_2/m^2$	**FAIL**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*57.6 kWh_{PE}/m^2*	
Dwelling primary energy	71.69 kWh_{PE}/m^2	**FAIL**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*23.6 kWh/m^2*	
Dwelling fabric energy efficiency	28.4 kWh/m^2	**FAIL**

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*	0.15	Walls (1) (0.15)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	N/A	N/A	**N/A**
Roofs	*0.16*	0.1	Roof (1) (0.1)	**OK**
Windows, doors, and roof windows	*1.6*	1.14	North East (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^2K]**
Exposed wall: Walls (1)	36.5402	0.15
Sheltered wall: Walls (2)	8.57	0.14 **(!)**
Party wall: Party Wall (1)	15.54	0 **(!)**
Exposed roof: Roof (1)	9.43	0.1 **(!)**
Exposed roof: Roof (2)	43.36	0.1 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1 **(!)**
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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	0.065	IG Lintels

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Not government-approved scheme	0.002 **(!)**	Kingspan Kooltherm
External wall	E4: Jamb	Not government-approved scheme	0.015 **(!)**	Kingspan Kooltherm
External wall	E16: Corner (normal)	Not government-approved scheme	0.039 **(!)**	Kingspan Kooltherm
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.02 **(!)**	Kingspan Kooltherm
External wall	E7: Party floor between dwellings (in blocks of flats)	SAP table default	0.28	
External wall	E17: Corner (inverted - internal area greater than external area)	SAP table default	0 **(!)**	
External wall	E6: Intermediate floor within a dwelling	SAP table default	0.14	
External wall	E11: Eaves (insulation at rafter level)	SAP table default	0.15	
External wall	E13: Gable (insulation at rafter level)	SAP table default	0.25	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.7%
Emitter type	Radiators
Flow temperature	55°C
System type	Combi boiler
Manufacturer	Vaillant Group UK
Model	ecoTEC plus 832 H combi A
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

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

6 Controls	
Main heating 1 - type: Programmer, room thermostat, and TRVs	
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	75 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	

iii. Be Green

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 11 Jun 2025 10:04:49

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	41 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Be Green Apartment 1
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*17.25 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	15.54 $kgCO_2/m^2$	**OK**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*92.44 kWh_{PE}/m^2*	
Dwelling primary energy	73.68 kWh_{PE}/m^2	**OK**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*40.3 kWh/m^2*	
Dwelling fabric energy efficiency	37.6 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*	0.12	Walls (1) (0.12)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.11	Flat 1 GF (0.11)	**OK**
Roofs	*0.16*	N/A	N/A	**N/A**
Windows, doors, and roof windows	*1.6*	1.2	North East (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^2K]**
Exposed wall: Walls (1)	28.8002	0.12 **(!)**
Sheltered wall: Walls (2)	8.57	0.11 **(!)**
Party wall: Party Wall (1)	16.22	0 **(!)**
Ground floor: Flat 1 GF, Flat 1 GF	40.76	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^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1.2
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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	0.065	IG Lintels

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Not government-approved scheme	0.002 **(!)**	Kingspan Kooltherm
External wall	E4: Jamb	Not government-approved scheme	0.015 **(!)**	Kingspan Kooltherm
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.041	Kingspan Kooltherm
External wall	E16: Corner (normal)	Not government-approved scheme	0.039 **(!)**	Kingspan Kooltherm
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.02 **(!)**	Kingspan Kooltherm
External wall	E7: Party floor between dwellings (in blocks of flats)	SAP table default	0.28	
External wall	E17: Corner (inverted - internal area greater than external area)	SAP table default	0 **(!)**	
Party wall	P1: Ground floor	SAP table default	0.32	
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.4%
Emitter type	Radiators
Flow temperature	
System type	Regular boiler
Manufacturer	Vaillant
Model	ecoTEC plus 615
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	80 litres
Declared heat loss	N/A
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: Programmer, room thermostat, and TRVs	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	*75 lm/W*	
Lowest light source efficacy	85 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	
Technology type: **Photovoltaic system (1)**	
Peak power	2 kWp
Orientation	South West
Pitch	45°
Overshading	None or very little
Manufacturer	
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 Array SAP 10 program, Array

Date: Wed 11 Jun 2025 10:05:03

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	41 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Be Green Apartment 2
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*14.97 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	13.31 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*80.19 kWh_{PE}/m^2*	
Dwelling primary energy	61.65 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*29.4 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^2K]***	**Dwelling average U-Value [W/m^2K]**	**Element with highest individual U-Value**	
External walls	*0.26*	0.12	Walls (1) (0.12)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	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*	1.1	North East (1.1)	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: Walls (1)	28.8002	0.12 **(!)**
Sheltered wall: Walls (2)	8.57	0.11 **(!)**
Party wall: Party Wall (1)	16.22	0 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.1 **(!)**
North East, Window	2.4522	North East	1.0	1.1 **(!)**
North West, Window	0.854	North West	1.0	1.1 **(!)**
North West, Front door	2.121	North West	N/A	1.1 **(!)**
South East, Window	0.854	South East	1.0	1.1 **(!)**

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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	0.065	IG Lintels
External wall	E3: Sill	Not government-approved scheme	0.002 **(!)**	Kingspan Kooltherm

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E4: Jamb	Not government-approved scheme	0.015 **(!)**	Kingspan Kooltherm
External wall	E16: Corner (normal)	Not government-approved scheme	0.039 **(!)**	Kingspan Kooltherm
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.02 **(!)**	Kingspan Kooltherm
External wall	E7: Party floor between dwellings (in blocks of flats)	Not government-approved scheme	0.07	SAP 10.2 Table R2
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.066	Kingspan Kooltherm
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)	SAP table default	0 **(!)**	

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	5 m^3/hm^2, Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.4%
Emitter type	Radiators
Flow temperature	
System type	Regular boiler
Manufacturer	Vaillant
Model	ecoTEC plus 615
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	80 litres
Declared heat loss	N/A
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: Programmer, room thermostat, and TRVs	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	*75 lm/W*	
Lowest light source efficacy	85 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	
Technology type: **Photovoltaic system (1)**	
Peak power	2 kWp
Orientation	South West
Pitch	45°
Overshading	1 (overshading factor calculated according to MCS)
Manufacturer	
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 Array SAP 10 program, Array

Date: Wed 11 Jun 2025 10:05:17

Project Information			
Assessed By	Neil Bradford	Building Type	Flat, End-terrace
OCDEA Registration	EES/022901	Assessment Date	2025-06-11

Dwelling Details			
Assessment Type	As designed	Total Floor Area	82 m^2
Site Reference	baseline/be lean/be green	Plot Reference	Be Green Apartment 3
Address			

Client Details	
Name	Jacob Wade
Company	P4BA
Address	15 Memorial Road, Worsley, Mancester, M28 3AQ

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	Mains gas	
Target carbon dioxide emission rate	*10.73 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	10.22 $kgCO_2/m^2$	**OK**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*56.95 kWh_{PE}/m^2*	
Dwelling primary energy	49.52 kWh_{PE}/m^2	**OK**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*25.9 kWh/m^2*	
Dwelling fabric energy efficiency	21.8 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*	0.12	Walls (1) (0.12)	**OK**
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	N/A	N/A	**N/A**
Roofs	*0.16*	0.1	Roof (1) (0.1)	**OK**
Windows, doors, and roof windows	*1.6*	1.2	North East (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^2K]**
Exposed wall: Walls (1)	36.5402	0.12 **(!)**
Sheltered wall: Walls (2)	8.57	0.11 **(!)**
Party wall: Party Wall (1)	15.54	0 **(!)**
Exposed roof: Roof (1)	9.43	0.1 **(!)**
Exposed roof: Roof (2)	43.36	0.1 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
North East, Window	1.3786	North East	1.0	1.2
North East, Window	2.4522	North East	1.0	1.2
North West, Window	0.854	North West	1.0	1.2
North West, Front door	2.121	North West	N/A	1.2
South East, Window	0.854	South East	1.0	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1**: 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	0.065	IG Lintels

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Not government-approved scheme	0.002 **(!)**	Kingspan Kooltherm
External wall	E4: Jamb	Not government-approved scheme	0.015 **(!)**	Kingspan Kooltherm
External wall	E16: Corner (normal)	Not government-approved scheme	0.039 **(!)**	Kingspan Kooltherm
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.02 **(!)**	Kingspan Kooltherm
External wall	E7: Party floor between dwellings (in blocks of flats)	Not government-approved scheme	0.07	SAP 10.2 Table R2
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.066	
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	0 **(!)**	Kingspan Kooltherm
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.03 **(!)**	Kingspan Kooltherm
External wall	E13: Gable (insulation at rafter level)	Not government-approved scheme	0.123	Kingspan Kooltherm
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 **(!)**	
Party wall	P5: Roof (insulation at rafter level)	Not government-approved scheme	0.08	SAP 10.2 Table R2
Roof	R8: Roof to wall (rafter)	Not government-approved scheme	0.06	SAP 10.2 Table R2
Roof	R4: Ridge (vaulted ceiling)	Not government-approved scheme	0.08	SAP 10.2 Table R2
Roof	R5: Ridge (inverted)	Not government-approved scheme	0.04	SAP 10.2 Table R2

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	4.5 m^3/hm^2, Design value	**OK**
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Boiler with radiators or underfloor heating - Mains gas	
Efficiency	88.4%
Emitter type	Radiators
Flow temperature	55°C
System type	Regular boiler
Manufacturer	Vaillant
Model	ecoTEC plus 615
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	80 litres
Declared heat loss	N/A
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: Programmer, room thermostat, and TRVs		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat		
Manufacturer		
Model		

7 Lighting		
Minimum permitted light source efficacy	*75 lm/W*	
Lowest light source efficacy	85 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	
Technology type: **Photovoltaic system (1)**	
Peak power	2 kWp
Orientation	South West
Pitch	45°
Overshading	None or very little
Manufacturer	
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		