

2 Gloucester Road, Luton

Energy and Sustainability Statement





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1.0 Executive Summary

EEABS (Elmstead Energy Assessments & Building Services) were instructed to produce an Energy and Sustainability Statement for the proposed development of 15 new Flats and non-domestic commercial spaces at 2 Gloucester Road, Luton.

This Energy and Sustainability statement can be used as a supporting document to the planning application to demonstrate that the overall energy and Sustainability strategy of the proposed development will meet the requirements set out by Building Regulations and local Luton Planning Policy.

Relevant Planning Policies

From inspection of the relevant policies and discussions with planning officers regarding the proposed development we consider that the following targets need to be met in order to comply with Part L Building Regulations and Luton Planning Policy.

- The domestic flats and non-domestic areas should improve upon the carbon emission requirements of Part L Building Regulations by at least 10%.
- The development will also consider other areas of sustainability within its design such as overheating, flood risk, waste, air quality, water usage, and materials to provide a low energy and sustainable design overall.

Assessment Methodology

To calculate the estimated carbon emissions of the development we have used Design SAP 10.2 software which is approved by Building Regulations. The baseline Target Emission Rate (TER) is calculated in accordance with Appendix R from the SAP 10.2 methodology.

To calculate the estimated carbon emission for the non-domestic areas of the development EDSL TAS Dynamic Simulation Modelling software has been used. The EDSL TAS software has been approved by the Department for Communities and Local Government (DCLG) for use as a Dynamic Simulation Model (DSM) software package.

The appraisals within this strategy are based on the Building Regulations Part L (2021) calculation methodology and should not be understood as a predictive assessment of likely future energy requirements or otherwise.

Carbon Emission Results

Savings have been made in the proposed design for both the domestic and non-domestic areas by following a Be Lean, Be Clean, Be Green Energy Hierarchy.

The results for the domestic areas show that under the proposed design the total carbon emissions would be 3.40 tonnes CO2, compared to 15.65 tonnes CO2 for the Baseline. This would be an overall improvement of 78.27% over the Part L 2021 Standard and therefore comfortably complies with the requirements of Part L 2021 Building Regulations and Luton Planning Policy.



The result for the non-domestic areas shows that under the proposed design the total carbon emissions would be 0.41 tonnes CO2, compared to 0.51 tonnes CO2 for the Baseline. This would be an overall improvement of 19.61% over the Part L 2021 Standard and therefore the non-domestic part of the development would also comply with the requirements of Part L 2021 Building Regulations and Luton Planning Policy.

Sustainability Measures

In collaboration with the Energy Assessment of the development, an initial analysis of the overheating within the domestic flats has also been carried out. (The non-domestic areas will have air conditioning cooling and therefore will not suffer from overheating). By following the overheating/cooling strategy the risk of overheating for the domestic units would be minimised. A full Part O CIBSE TM59 report can be submitted once planning permission has been granted.

Any demolition will be recycled where possible. A demolition audit will be carried out before any works progress on site to identify which materials can be recycled. The development will also consider the concept of the waste hierarchy in both the demolition of any structures and when constructing the proposed domestic units and non-domestic areas.

The building, wherever possible, will use environmentally friendly materials and manufacturers will be chosen that can demonstrate their products are sustainably sourced and produced.

The water usage for the domestic units will not exceed a maximum of 110 litres/person/day (including 5 litres for external water use) as required by the optional requirement of Part G Building Regulations. These calculations will be produced at later design stages once specific sanitaryware has been selected.

The flood map shows that the proposed development site is within Flood Zone 1. It is believed that a full flood risk assessment is therefore not required, but if it is then this will be carried out by others.

The surface water flood map service states that the proposed site sits within an area of low risk from surface water flooding. The final drainage (SuDS) design will be carried out by others, and should ensure that run off rates are no worse than before and that any relevant planning requirements have been achieved.

The Road Noise Map below shows that the site (red square on the image) is located close to high levels of road noise. For this reason, a whole house mechanical ventilation system has been proposed, this will be able to provide the flats with fresh air without the need to open windows.

The Railway Noise Map below shows that the site (red square on the image) is located far enough away from high levels of railway noise.

The proposed development will not adversely impact upon the air quality of the location. The proposed main heating system for the development is from air source heat pumps which have no harmful emissions.



Conclusion

This energy and sustainability statement has shown that the proposed development of 15 new Flats and non-domestic commercial spaces at 2 Gloucester Road, Luton would satisfy the energy and sustainability requirements of Building Regulations and Local Luton Planning Policy.



2.0 Introduction

EEABS (Elmstead Energy Assessments & Building Services) were instructed to produce an Energy and Sustainability Statement for the proposed development of 15 new Flats and non-domestic commercial spaces at 2 Gloucester Road, Luton.

This Energy and Sustainability statement can be used as a supporting document to the planning application to demonstrate that the overall energy and Sustainability strategy of the proposed development will meet the requirements set out by Building Regulations and local Luton Planning Policy.

2.1 Planning Policy Context

Numerous policies that relate to the energy efficiency and carbon emissions of the development have been considered in preparation of this energy assessment.

2.1.1 National Planning Policy Framework

The National Planning Policy Framework encourages local planning authorities to adopt proactive strategies to mitigate and adapt to climate change. They should plan for new development in ways which reduce greenhouse gas emissions; actively support energy efficiency improvements to existing buildings; and set local sustainability requirements which are consistent with the government's policies and standards.

2.1.2 Building Regulations Part L 2021

The assessment of the development against policy targets has been carried out using the very latest Part L 2021 benchmarks. The Part L 2021 targets represent approximately a 30% reduction in carbon emissions in comparison to the Part L 2013 target.

Part L 2021 is mandatory and requires that a dwelling does not exceed the CO2 emission rate of that set by a Target Emission Rate (TER) calculated in accordance with Appendix R from the SAP 10.2 methodology. It also requires that a dwelling does not exceed the Target Fabric Energy Efficiency (TFEE) and Target Primary Energy Rate (TPER).

Part L 2021 also requires that any non-domestic parts of a building do not exceed the CO2 emission and Primary Energy Rate of that set by a Target Emission Rate (TER) and Target Primary Energy Rate (TPER) to the approved 2021 National Calculation Methodology (NCM).

2.1.3 Luton Borough Council

The Luton Borough Council Local Plan (2011-2031) Policy LLP37 requires developments to contribute towards mitigation, and adaption to climate change through energy use reduction, efficiency, and renewable energy. This is known as the energy hierarchy (Be Lean, Be Clean, Be Green). New developments should at least meet the latest Part L Building Regulations requirements but discussions with planning officers indicated that they would like to see a further 10% improvement.

Other areas of sustainability such as overheating, flood risk, waste, air quality, and materials will also be considered to provide a low energy and sustainable design overall.



3.0 Assessment Methodology

The following methodology has been used to calculate the CO2 emissions for the development.

3.1 Domestic Areas

To calculate the estimated carbon emissions of the developments domestic areas we have used Design SAP 10.2 software which is approved by Building Regulations. The baseline Target Emission Rate (TER) is calculated in accordance with Appendix R from the SAP 10.2 methodology.

3.2 Non-Domestic Areas

To calculate the estimated carbon emission for the non-domestic areas of the development EDSL TAS Dynamic Simulation Modelling software has been used. The EDSL TAS software has been approved by the Department for Communities and Local Government (DCLG) for use as a Dynamic Simulation Model (DSM) software package.

As part of its approval process, the TAS software had to demonstrate that it satisfies all of the tests and other requirements defined within sections 2 and 3 of the document "CIBSE TM33:2006, CIBSE standard tests for the assessment of building services design software". The thermal modelling has also been carried out in accordance with CIBSE AM11 Building Energy and Environmental Modelling.

3.3 Limitations

The appraisals within this strategy are based on the Building Regulations Part L (2021) calculation methodology and should not be understood as a predictive assessment of likely future energy requirements or otherwise.

Occupants may operate their systems differently, and/or the weather may be different from the assumptions made by Part L approved calculation methods, leading to differing energy requirements once the development is in operation.



4.0 Energy Assessment - Domestic Areas

The following sections describe how the baseline and proposed developments Carbon Emissions have been calculated for the residential units.

4.1 Baseline Target

The baseline Target Emission Rate (TER) is calculated in accordance with Appendix R from the SAP 10.2 methodology. This Baseline CO2 emission rate is then used as the basis for the target CO2 reductions required throughout the Energy Hierarchy.

Table 1 - Baseline Carbon Emission Results for Domestic Areas

| Plots | Area (m2) | CO2 Emission Rate (kgCO2/m2) | CO2 Emissions (Tonnes of CO2) |
|-------|--------------|---------------------------------|----------------------------------|
| 1 | 54 | 16.32 | 0.88 |
| 2 | 97 | 12.57 | 1.22 |
| 3 | 68 | 13.18 | 0.90 |
| 4 | 55 | 15.12 | 0.83 |
| 5 | 97 | 12.57 | 1.22 |
| 6 | 68 | 13.18 | 0.90 |
| 7 | 55 | 15.12 | 0.83 |
| 8 | 97 | 12.57 | 1.22 |
| 9 | 68 | 13.18 | 0.90 |
| 10 | 55 | 15.12 | 0.83 |
| 11 | 54 | 17.34 | 0.94 |
| 12 | 97 | 12.22 | 1.19 |
| 13 | 96 | 11.91 | 1.14 |
| 14 | 96 | 11.91 | 1.14 |
| 15 | 116 | 13.06 | 1.51 |
| | | Total | 15.65 |

The results show that the total Target CO2 emissions for the developments residential areas is estimated to be 15.65 Tonnes of CO2 per annum.



4.2 Proposed Design - Following the Energy Hierarchy

4.2.1 Be Lean

The Be Lean stage of the energy hierarchy focuses on passive design measures which are those which reduce the initial energy demand of the building through passive means, for example wall insulation once installed requires no other means of operation and its performance is also unlikely to deteriorate.

Where possible the development has taken a fabric first approach to reducing the initial energy demand by the following methods:

Glazing Performance

Windows and glazed doors are be highly efficient glazing and will have a low U-value of 1.20 W/m².K, helping to reduce the amount of heat loss through the glazing.

Thermal Envelope

The inclusion of high levels of thermal insulation not only helps to reduce the buildings overall energy demand and therefore carbon emissions, but it also plays a vital role in securing the occupant's thermal comfort.

It also helps to reduce the buildings peak heating load required meaning that smaller plant equipment can be sized, helping to further improve not only carbon emissions but also the cost of the development.

The proposed walls, floor, and roofs will provide significant savings over the Part L limiting fabric parameters.

Thermal Bridging

Thermal bridges are junctions between parts of the build through which heat can escape, for example the junction where a roof and wall construction meet. To reduce heat loss through these areas we have assumed that Knauf thermal bridging details will be followed. (Individual Psi values assumed for each of the junctions can be found within the SAP calculation sheets within the appendices.)

Air Permeability

The air permeability of the development is a measure of how much volume of air can penetrate through its fabric. Therefore, a well built, highly sealed building would result in less unwanted heat loss, and therefore provide a more efficient building.

Part L 2021 Building Regulations have a maximum limit of 8 m³/h.m² that must be achieved, the proposed development will target a value of 3 m³/h.m².



Summary of Passive Design Measures

The table below shows a summary of the passive design measures included for within the development and how they compare against the Part L requirements.

Table 2 - Summary Table of Passive Design Measures for Domestic Areas

| Parameter | Part L Limiting Values | Development Proposal | % Improvement |
|------------------|------------------------------------|--------------------------------------|---------------|
| U-Values | | | |
| Walls | 0.26 W/m ² .K | 0.18 W/m ² .K | 31% |
| Roofs | 0.16 W/m ² .K | 0.11 W/m ² .K | 31% |
| Ground Floor | 0.18 W/m ² .K | N/A | N/A |
| Glazing | 1.60 W/m ² .K | 1.20 W/m ² .K | 25% |
| | | | |
| Air Permeability | 8 m ³ /h.m ² | 3.0 m ³ /h.m ² | 63% |

The summary of passive measures shows that the proposed development will be a considerable improvement over the Part L limiting fabric parameters.

4.2.2 Be Clean

The Be Clean Stage of the Energy Hierarchy focuses on energy efficiency measures which are those which seek to supply the remaining demand for energy, after the initial demand has been lowered through passive means, in the most efficient way.

The following energy efficiency measures have been incorporated within the proposed development:

Heating and Hot Water

The development is too small to consider connection to an area wide heat network or for a combined heat and power system to be installed (there is also issues with local air quality surrounding CHP systems) and therefore an air source heat pump system was deemed to be the most feasible system to install to serve the units heating and hot water requirements.

An air source heat pump is considered as a renewable and low carbon technology and therefore more information will be provided under the Be Green Stage.

Lighting

The lighting for the development will consist of low energy LED lighting throughout with a minimum light source efficacy of at least 80 lm/W.

Ventilation

The ventilation in each flat is assumed to be mechanical, served by a whole house heat recovery ventilation system. This is assumed to have a specific fan power of 0.73 W/l/s and a heat recovery efficiency of 90%.



4.2.3 Be Green

The Be Green stage of the energy hierarchy focuses on on-site low and zero carbon renewable technologies.

Air Source Heat Pumps

We have assumed that each Flat will have its heating and hot water served by an air source heat pump system with an assumed efficiency of at least 219.3%.

Photovoltaic Solar Panels

We have also assumed that each Flat would have 2No. 400W Solar Panels (800 Watts total) located on the roof of the development.

4.2.4 Proposed Design Results

The results below show total carbon emissions in kgCO2/m2 and tonnes CO2 for the proposed design following the energy hierarchy as previously described.

Table 3 - Proposed Design Carbon Emission Results for Domestic Areas

| Plots | Area (m2) | CO2 Emission Rate (kgCO2/m2) | CO2 Emissions (Tonnes of CO2) |
|-------|--------------|---------------------------------|----------------------------------|
| 1 | 54 | 3.11 | 0.17 |
| 2 | 97 | 2.86 | 0.28 |
| 3 | 68 | 2.73 | 0.19 |
| 4 | 55 | 2.77 | 0.15 |
| 5 | 97 | 2.86 | 0.28 |
| 6 | 68 | 2.73 | 0.19 |
| 7 | 55 | 2.77 | 0.15 |
| 8 | 97 | 2.86 | 0.28 |
| 9 | 68 | 2.73 | 0.19 |
| 10 | 55 | 2.77 | 0.15 |
| 11 | 54 | 3.44 | 0.19 |
| 12 | 97 | 2.86 | 0.28 |
| 13 | 96 | 2.75 | 0.26 |
| 14 | 96 | 2.75 | 0.26 |
| 15 | 116 | 3.44 | 0.40 |
| | | Total | 3.40 |

The results for the domestic areas show that under the proposed design the total carbon emissions would be 3.40 tonnes CO2, compared to 15.65 tonnes CO2 for the Baseline. This would be an overall improvement of 78.27% over the Part L 2021 Standard and therefore comfortably complies with the requirements of Part L 2021 Building Regulations and Luton Planning Policy.

The SAP Calculation sheets for the proposed Flats can be found within Appendix A.



5.0 Energy Assessment - Non-Domestic Areas

The following sections describe how the baseline and proposed developments Carbon Emissions have been calculated for the non-domestic areas.

5.1 Baseline Target

The EDSL TAS modelling software automatically generates a notional building using the geometry for the proposed building, but allocating glazing coverage, U-values, and plant efficiency in accordance with the Elemental Method as defined in NCM modelling Guide 2021.

The software calculates an Emissions Rate for the Notional building which is the Target Emission Rate (TER) for the actual building. The TER is the emission rate which must be met in order to achieve Part L compliance.

5.2 Proposed Design - Following the Energy Hierarchy

5.2.1 Be Lean

Where possible the non-domestic development has also taken a fabric first approach to reducing the initial energy demand by the following methods:

Glazing Performance

Windows and glazed doors are be highly efficient glazing and will have a low U-value of 1.2 W/m².K, helping to reduce the amount of heat loss through the glazing.

Thermal Envelope

The inclusion of high levels of thermal insulation not only helps to reduce the buildings overall energy demand and therefore carbon emissions, but it also plays a vital role in securing the occupant's thermal comfort.

It also helps to reduce the buildings peak heating load required meaning that smaller plant equipment can be sized, helping to further improve not only carbon emissions but also the cost of the development.

The proposed walls, floor, and roofs will provide significant savings over the Part L limiting fabric parameters.

Air Permeability

The air permeability of the development is a measure of how much volume of air can penetrate through its fabric. Therefore, a well built, highly sealed building would result in less unwanted heat loss, and therefore provide a more efficient building.

Part L 2021 Building Regulations have a maximum limit of 8 m³/h.m² that must be achieved, the proposed development will target a value of 3 m³/h.m².



Summary of Passive Design Measures

The table below shows a summary of the passive design measures included for within the development and how they compare against the Part L requirements.

Table 4 - Summary Table of Passive Design Measures for Non-Domestic Areas

| Parameter | Part L Limiting Values | Development Proposal | % Improvement |
|------------------|------------------------------------|------------------------------------|---------------|
| U-Values | | | |
| Walls | 0.26 W/m ² .K | 0.18 W/m ² .K | 31% |
| Roofs (Flat) | 0.18 W/m ² .K | N/A | N/A |
| Floors | 0.18 W/m ² .K | 0.18 W/m ² .K | 0% |
| Glazing | 1.60 W/m ² .K | 1.20 W/m ² .K | 25% |
| | | | |
| Air Permeability | 8 m ³ /h.m ² | 3 m ³ /h.m ² | 63% |

The summary of passive measures shows that the proposed development will be an improvement over the Part L limiting fabric parameters.

5.2.2 Be Clean

The following energy efficiency measures have been incorporated within the proposed development. As with the residential areas, the commercial area is far too small to consider connection to a district heat network or installing a CHP system. It would be best to provide its heating and also cooling from an air source heat pump system, with toilets and circulation areas heated by direct electric panel heaters.

Hot Water

Hot water is assumed to be provided by point of use electric water heaters.

Lighting

The lighting for the development will consist of low energy LED lighting throughout with a minimum light source efficacy of at least 100 lm/W. Offices will have photocell daylight dimming control and circulation areas, toilets, and stores will also have auto on/off control.

Ventilation

The ventilation to the main office areas is assumed to be provided by a heat recovery mechanical ventilation system with an assumed specific fan power of 1.6 W/l/s and a heat recovery efficiency of 80%.

Toilets and kitchenettes have local mechanical extract with an assumed specific fan power of $0.3 \, \text{W/l/s}$.

All other areas are assumed to be naturally ventilated.



5.2.3 Be Green

The Be Green stage of the energy hierarchy focuses on on-site low and zero carbon renewable technologies.

Air Source Heat Pumps

We have assumed that the main office areas will have heating and cooling provided by an air source heat pump air conditioning system with assumed seasonal efficiencies of 400% for heating and 600% for cooling.

Solar Photovoltaic Panels

We have assumed that the non-domestic area will have a solar Photovoltaic system on the roof of the development. This will feature 8 No. 400-Watt panels to provide a system of 3.2 kW peak. This is estimated to produce at least 3,200 kWh of green electricity per year.

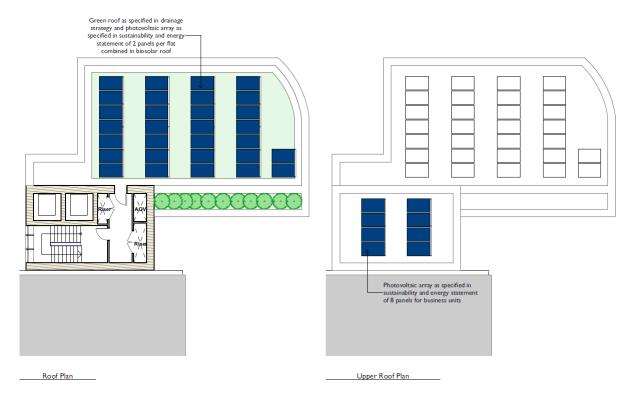
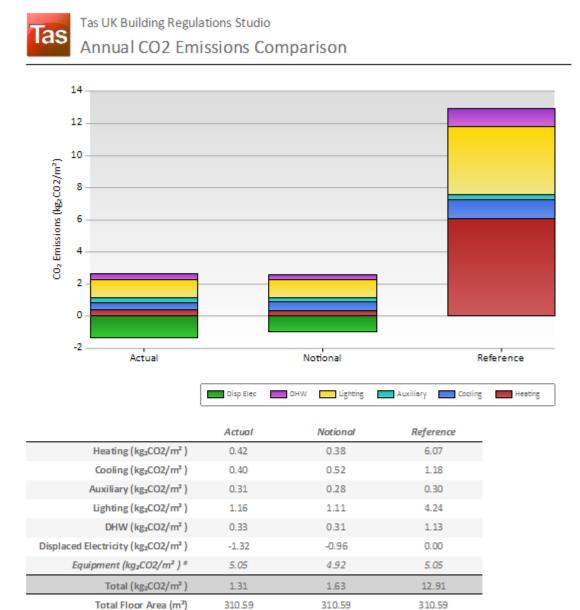


Figure 1 - Proposed Solar Panel Layout on the Roof



5.2.4 Proposed Design Results

The results below show total carbon emissions in kgCO2/m2 for the proposed non-domestic design following the energy hierarchy as previously described.



"Energy used by equipment does not contribute to total value - It is presented here for comparison only

Figure 2 - Proposed Design Carbon Emission Results for Non-Domestic Area

The result for the non-domestic areas shows that under the proposed design the total carbon emissions would be 0.41 tonnes CO2, compared to 0.51 tonnes CO2 for the Baseline (Notional). This would be an overall improvement of 19.61% over the Part L 2021 Standard and therefore the non-domestic part of the development would also comply with the requirements of Part L 2021 Building Regulations and Luton Planning Policy.

The BRUKL Document for the proposed non-domestic areas can be found within Appendix B.



6.0 Sustainability

6.1 Overheating/Climate Change Adaptability

In collaboration with the Energy Assessment of the development, an initial analysis of the overheating within the domestic flats has also been carried out. (The non-domestic areas will have air conditioning cooling and therefore will not suffer from overheating).

1. Minimise Internal Heat Gains

To minimise internal heat gains low energy lighting will be used throughout the development. Any new heating pipework will also be well insulated, white goods and computer equipment should also be of the highest efficiency.

2. Reduce the Amount of Heat Entering the Building

Highly efficient windows will reduce the amount of solar gain entering the flats.

3. Use of Thermal Mass and High Ceilings to Manage Heat within the Building

The building will have a medium thermal mass and it will be well insulated with an improved air permeability value to stop heat from first entering the building.

4. Passive Ventilation

Windows should be openable to allow for additional fresh air when required. (Although not overly relied upon due to noise issues)

5. Mechanical Ventilation

A whole house Mechanical supply and extract ventilation system has also been proposed to provide fresh air into the flats continuously.

By following the above overheating/cooling strategy the risk of overheating for the domestic units would be minimised. A full Part O CIBSE TM59 report can be submitted once planning permission has been granted.



6.2 Land Use and Waste

Any demolition will be recycled where possible. A demolition audit will be carried out before any works progress on site to identify which materials can be recycled.

The development will also consider the concept of the waste hierarchy shown below in both the demolition of any structures and when constructing the proposed domestic units and non-domestic areas.

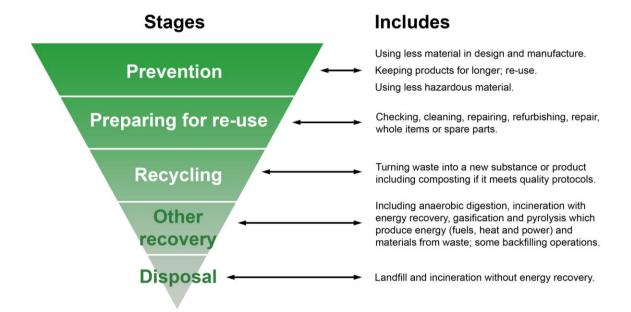


Figure 3 - Waste Hierarchy Diagram

6.3 Materials Use

It is the design team's intention to minimise waste during the construction process through careful consideration of materials and construction methodology. The building, wherever possible, will use environmentally friendly materials and manufacturers will be chosen that can demonstrate their products are sustainably sourced and produced.

6.4 Water Efficiency

All taps, toilets, and showers will be specified that are considered to be low water use.

The water usage for the domestic units will not exceed a maximum of 110 litres/person/day (including 5 litres for external water use) as required by the optional requirement of Part G Building Regulations.

Calculations to prove how this can be achieved can be seen below. These calculations will be updated at later design stages once specific sanitaryware has been selected.



Table 5 - Water Efficiency Calculator

| Installation Type | Unit of Measure | Capacity / Flow Rate | Use Factor | Fixed Use (litres/person/day) | Litres / person / day |
|--|--|-------------------------|---------------|----------------------------------|--------------------------|
| WC (dual flush) | Full Flush Volume (litres) | 4 | 1.46 | 0 | 5.84 |
| wc (duai iidsii) | Part Flush Volume (litres) | 2.6 | 2.96 | 0 | 7.70 |
| Taps (excluding kitchen / utility room taps) | Flow Rate (litres / minute) | 5 | 1.58 | 1.58 | 9.48 |
| Bath (where shower also present) | Capacity to Overflow (litres) | 170 | 0.11 | 0 | 18.70 |
| Shower (where bath also present) | Flow Rate (litres / minute) | 8 | 4.37 | 0 | 34.96 |
| Kitchen / Utility Room Sink Taps | Flow Rate (litres / minute) | 6 | 0.44 | 10.36 | 13.00 |
| Washing Machine | Litres / kg Dry Load | 8.17 | 2.10 | 0 | 17.16 |
| Dishwasher | Litres / Place Setting | 1.25 | 3.60 | 0 | 4.50 |
| | | Total Calc | ulated Use (| litres / person / day) | 111.33 |
| | Contribution from Greywater (litres / person / day) | | | | 0.00 |
| | Contribution from Rainwater (litres / person / day) | | | 0.00 | |
| Normalisation Factor | | | 0.91 | | |
| | Total Internal Water Consumption (litres / person / day) | | | 101.31 | |
| | External Water Use (litres / person / day) | | | 5.00 | |
| | Overall T | otal Water Co | nsumption (| (litres / person / day) | 106.31 |



6.5 Flood Risk

The extent of possible flooding on the site has also been analysed using data from the government flood warning information service.



Figure 4 - Flood Risk Map for the Site

The flood map shows that the proposed development site is within Flood Zone 1. It is believed that a full flood risk assessment is therefore not required, but if it is then this will be carried out by others.





Figure 5 - Surface Water Map for the Site

The surface water flood map service states that the proposed site sits within an area of low risk from surface water flooding. The final drainage (SuDS) design will be carried out by others, and should ensure that run off rates are no worse than before and that any relevant planning requirements have been achieved.



6.6 Noise

The Road Noise Map below shows that the site (red square on the image) is located close to high levels of road noise. For this reason, a whole house mechanical ventilation system has been proposed, this will be able to provide the flats with fresh air without the need to open windows.

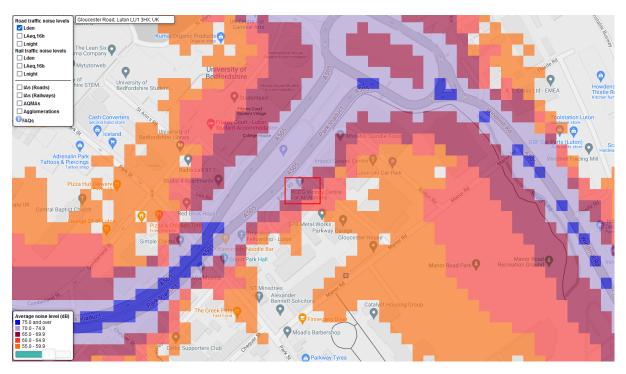


Figure 6 - Road Noise Map for the Site



The Railway Noise Map below shows that the site (red square on the image) is located far enough away from high levels of railway noise.

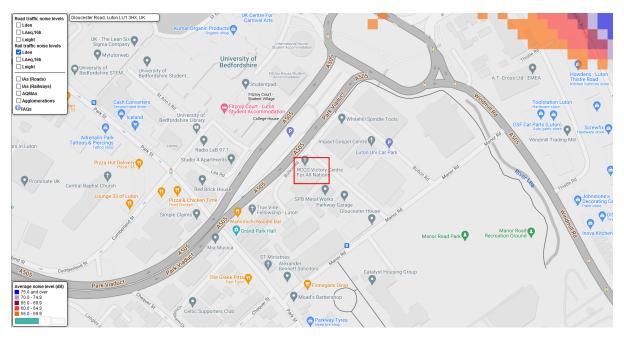


Figure 7 - Railway Noise Map for the Site

6.7 Air Quality

The proposed development will not adversely impact upon the air quality of the location. The proposed main heating system for the development is from air source heat pumps which have no harmful emissions.



Appendix A - Part L 2021 SAP 10.2 Calculation Sheets for Domestic Flats

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 05 Jul 2023 11:45:14

| Project Information | | | | | |
|---------------------|--------------|-----------------|---------------------|--|--|
| Assessed By | Darren Coham | Building Type | Flat, Semi-detached | | |
| OCDEA Registration | EES/022007 | Assessment Date | 2023-07-05 | | |

| Dwelling Details | | | | | |
|------------------|-----------------------|------------------|-------------------|--|--|
| Assessment Type | As designed | Total Floor Area | 54 m ² | | |
| Site Reference | Flat 1 | Plot Reference | 00001 | | |
| Address | Flat 1, Luton, LU1 3H | HX | | | |

| Client Details | | | | |
|----------------|------|--|--|--|
| Name - | | | | |
| Company | | | | |
| Address | 5555 | | | |

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 | 16.32 kgCO ₂ /m ² | | | | |
| Dwelling carbon dioxide emission rate | 3.11 kgCO ₂ /m ² | OK | | | |
| 1b Target primary energy rate and dwelling primary ener | gy | | | | |
| Target primary energy | $88.27 \text{ kWh}_{PE}/\text{m}^2$ | | | | |
| Dwelling primary energy | 36.82 kWh _{PE} /m ² | OK | | | |
| 1c Target fabric energy efficiency and dwelling fabric energy efficiency | | | | | |
| Target fabric energy efficiency | 38.9 kWh/m ² | | | | |
| Dwelling fabric energy efficiency | 36.4 kWh/m ² | OK | | | |

| 2a Fabric U-values | : | | | |
|--------------------|---|----------------------------------|---|-----|
| Element | Maximum permitted average U-Value [W/m²K] | Dwelling average U-Value [W/m²K] | 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, | 1.6 | 1.17 | pd1 (1.2) | ОК |
| and roof windows | | | | |
| 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) | 48.12 | 0.18 | | | | | | |
| Sheltered wall: Walls (2) | 23.9049 | 0.18 | | | | | | |
| Party wall: Party Wall (1) | 15.07 | 0 (!) | | | | | | |

| 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] | | | |
| pd1, Windows | 5.4 | North West | 0.75 | 1.2 | | | |
| w1, Windows | 3.24 | North West | 0.75 | 1.2 | | | |
| w2, Windows | 5.04 | South East | 0.75 | 1.2 | | | |
| ed1, Entrance Doors | 2.0951 | North East | N/A | 1 (!) | | | |

| Building part 1 - | Main Dwelling: Thermal bridging of | calculated from linear thermal transmit | tances for eac | h junction |
|-------------------|---|--|---------------------|---------------------|
| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
| External wall | E1: Steel lintel with perforated steel base plate | Calculated by person with suitable expertise | | Thermally Broken |
| External wall | E4: Jamb | Calculated by person with suitable expertise | 0.018 (!) | Knauf |

Date generated: 2023-07-05 11:45:14

| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
|---------------|---|--|---------------------|---------------------|
| External wall | E7: Party floor between dwellings (in blocks of flats) | Calculated by person with suitable expertise | 0.065 | Knauf |
| External wall | E16: Corner (normal) | Calculated by person with suitable expertise | 0.048 | Knauf |
| External wall | E18: Party wall between dwellings | Calculated by person with suitable expertise | 0.069 | Knauf |
| External wall | E25: Staggered party wall between dwellings | Calculated by person with suitable expertise | 0.088 | Knauf |
| Party wall | P3: Intermediate floor between dwellings (in blocks of flats) | SAP table default | 0 (!) | Default |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.09 | Knauf |
| External wall | E8: Balcony within a dwelling - wall insulation continuous | SAP table default | 0.1 | Default |

| 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 | n radiators or underfloor heating - Electricity | | | | | | |
| Efficiency | 219.3% | | | | | | |
| Emitter type | Radiators | | | | | | |
| Flow temperature | 45°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 | 150 litres | |
| Declared heat loss | 1.7 kWh/day | |
| Primary pipework insulated | Yes | |
| Manufacturer | | |
| Model | | |
| Commissioning | | |
| Waste water heat recovery syste | n 1 - type: N/A | |
| Efficiency | | |
| Manufacturer | | |
| Model | | |

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

| 7 Lighting | | | |
|---|---------|----|--|
| Minimum permitted light source efficacy | 75 lm/W | | |
| Lowest light source efficacy | 80 lm/W | OK | |
| External lights control | N/A | • | |

| 8 Mechanical ventilation | | | |
|---|-------------------------|---|----|
| System type: Balanced whole-house me | echanical ventilation v | with heat recovery | |
| Maximum permitted specific fan power | 1.5 W/(l/s) | | |
| Specific fan power | 0.73 W/(l/s) | | OK |
| Minimum permitted heat recovery | 73% | | |
| efficiency | | | |
| Heat recovery efficiency | 90% | | OK |
| Manufacturer/Model | HRV1 Q Plus | | |
| Commissioning | | | |
| 9 Local generation | | | |
| Technology type: Photovoltaic system | (1) | | |
| Peak power | 0.8 kWp | | |
| Orientation | South | | |
| Pitch | 30° | | |
| Overshading | None or very little | | |
| Manufacturer | Trong of vory little | | |
| MCS certificate | | | |
| | | | |
| 10 Heat networks | | | |
| N/A | | | |
| 11 Supporting documentary evidence | | | |
| N/A | | | |
| 40 D | | | |
| 12 Declarations | | | |
| a. Assessor Declaration | | stanta of this DDEL Compliance Depart | |
| | | Intents of this BREL Compliance Report of the submitted for this dwelling for | |
| | | <u> </u> | |
| the purpose of carrying out the "As de evidence (SAP Conventions, Appendi | | | |
| documentary evidence required) has | | | |
| Compliance Report. | been reviewed in the | course of preparing this BNEL | |
| Compliance Report. | | | |
| | | | |
| Signed: | | Assessor ID: | |
| Oigneu. | | A3363301 ID. | |
| | | | |
| Name: | | Date: | |
| radiio. | | Daic. | |

b. Client Declaration

N/A



| Property Reference | E | 4 | | | | | | | | Joseph | ad a n Bata | 051 | 07/000 | 0 |
|------------------------------------|-------------------------|---------------------|--|-------------------------------|---|--|---|----------------------------|--------------------|---|--|----------------|---|---------------------------------|
| | Flat | | | | | | Duou | Tomal | Def | | ed on Date | 05/ | 07/202 | 3 |
| Assessment Reference | 0000 | | D16 1 - 1- 1- | 1114.01 | | | | | | Flat | | | | |
| Property | Flat | i, Luion, | Bedfordshi | re, LUT 3F | 1.7. | | | | | | | | | |
| SAP Rating | | | | 88 B | | DER | | 3.11 | | | TER | | 16.32 | |
| Environmental | | | | 98 A | | % DER < TER | | | | | | | | |
| CO ₂ Emissions (t/year) | | | | 0.15 | | DFEE | | 36.3 | 88 | | TFEE | | 38.88 | |
| Compliance Check | | | | See BRE | ĒL | % DFEI | E < TFE | | | | | | 6.42 | |
| % DPER < TPER | | | | 58.28 | | DPER | | 36.8 | 32 | | TPER | | 88.27 | |
| Assessor Details | Mr. Darre | n Coham | <u> </u> | | | | | | | | Assesso | r ID | R789-0 | 001 |
| Client | | | | | | | | | | | | | | |
| SUMMARY FOR INPU | T DATA FO | DR: Nev | v Build (<i>i</i> | As Desig | ned) | | | | | | | | | |
| Orientation | | | · | Northeas | | | | | | | | | | |
| Property Tenture | | | | ND | , , , , , , , , , , , , , , , , , , , | | | | | | | | | |
| Transaction Type | | | | 6 | | | | | | | | | | |
| Terrain Type | | | Urban | | | | | | | | | | | |
| 1.0 Property Type | | | | ni-Detached | | | | | | | | | | |
| Position of Flat | | | Mid-floor | | | | | | | | | | | |
| | | | 1 | ııaı | | | | | | | | | | |
| Which Floor | | | | | | | | | | | | | | |
| 2.0 Number of Storeys | | | 1 | | | | | | | | | | | |
| 3.0 Date Built | | | 2023 | | | | | | | | | | | |
| | 4.0 Sheltered Sides | | | 2 | | | | | | | | | | |
| 5.0 Sunlight/Shade | _ | | | Average or unknown | | | | | | | | | | |
| 6.0 Thermal Mass Parame | ter | | | Precise calculation | | | | | | | | | | |
| Thermal Mass | | | | N/A | | | | | | | kJ/m²K | | | |
| 7.0 Electricity Tariff | | | | Standard | d | | | | | | | | | |
| Smart electricity meter f | itted | | | Yes | | | | | | | | | | |
| Smart gas meter fitted | | | | Yes | | | | | | | | | | |
| 7.0 Measurements | | | | | | | | | | | | | | |
| | | | | (| Basemen Ground floo 1st Store 2nd Store 3rd Store 4th Store 5th Store 6th Store 7th Store | t: r: y: y: y: y: y: y: | 0.00 m 32.52 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m | n n i i i i | r In | 0.00 53.70 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |) m ² m ² m ² m ² m ² m ² | Avera | 9e Stor 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00 | m m m m m m m |
| 8.0 Living Area | | | | 25.93 | | | | | | | m² | | | |
| 9.0 External Walls | _ | | | | | | | _ | | | | _ | | |
| Description | Type | Covity | | oard on dete | AAC blast | | (kJ/m²K) | Area(m²) | | Res | Shelter | • | - | a Calculation Type |
| External Wall 1 Sheltered Wall | Cavity Wall Cavity Wall | filled ca Cavity | wall : plasterb avity, any outs wall : plasterb avity, any outs | ide structure oard on dabs | | 0.18 0.18 | 60.00 | 61.80 26.00 | 48.12 23.90 | 0.00 | None Stairwell Acc Corridor | | | ulate Wall Are |
| 9.1 Party Walls | | | | | | | | | | | | | | |
| Description | Type | | Construc | tion | | | | | U-Value (W/m²K) | Kappa | | Shelter Res | S | helter |
| Party Wall 1 | Filled Ca Edge Se | avity with aling | | ard on dat C blocks, o | os mounted o cavity | on cemen | t render | on both | | 45.00 | | 0.00 | | None |
| 9.2 Internal Walls Description | | | Construct | ion | | | | | | | | K | арра | Area (m² |
| Description Constructi | | | | | | | | | | | | | • | |
| Internal Wall 1 | | | Plasterboa | rd on timb | er frame | | | | | | | | I/m²K) 9.00 | 86.67 |

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| Description | Construction | | | | | | | Kappa (kJ/m²K) | Area (m²) | | |
|---|----------------------------|----------------------|--------|---------------------------------------|-----------------------|--------------------|--------------------------|--------------------------|---------------|-------------------|--------------------|
| Party Ceiling 1 | | Precas | t con | crete plank floor (screed l | aid on insulat | ion), carpet | ied | | | 30.00 | 53.70 |
| I1.1 Party Floors | | Storov | Con | otruction. | | | | | | Kanna | Aron (m² |
| Description | | Storey Index | Con | struction | | | | | | Kappa (kJ/m²K) | |
| Party Floor 1 | | Lowest occupied | Prec | ast concrete plank floor (| screed laid or | insulation) |), carpeted | l | | 30.00 | 53.70 |
| 12.0 Opening Types | | _ | | . | | . . | | | _ | _ | |
| Description Da | ata Source | Туре | | Glazing | | Glazing Gap | Filling Type | G-value | Frame Type | Frame Factor | U Value (W/m²K) |
| | anufacturer anufacturer | Solid Door Window | r | Double Low-E Soft | 0.05 | • | Air Filled Air Filled | | Wood Wood | 0.70 0.75 | 1.00 1.20 |
| 13.0 Openings | | | | | | | | | | | |
| | Opening Typ | ре | | Location | | Orienta | | Area | | P | itch |
| | Windows Windows | | | External Wall 1 External Wall 1 | | North \ North \ | | 5.4 3.2 | | | 0 |
| w2 ed1 | Windows Entrance Do | oro | | External Wall 1 Sheltered Wall | | South North | | 5.0 2.1 | | | 0 |
| | Entrance Do | <u> </u> | | None | | NOILII | | | | | <u> </u> |
| 4.0 Conservatory | | | l I | 100 | | | | | | | |
| 15.0 Draught Proofing | | | l | | | | | 70 | | | |
| 16.0 Draught Lobby | | | | No | | | | | | | |
| 7.0 Thermal Bridging | | | [| Calculate Bridges | | | | | | | |
| 7.1 List of Bridges | | | | | | | | | | | |
| Bridge Type E1 Steel lintel with perforated | l steel hase n | late | | ce Type pendently assessed | Length 6.72 | Psi 0.07 | Adjusted 0.07 | I Reference Thermally | | | Importe Yes |
| E4 Jamb | · | | Inde | pendently assessed | 18.50 | 0.02 | 0.02 | Knauf | DIORCII | | Yes |
| E7 Party floor between dwelli E16 Corner (normal) | ngs (in blocks | s of flats) | | pendently assessed pendently assessed | 65.04 10.80 | 0.07 0.05 | 0.07 0.05 | Knauf Knauf | | | No No |
| E18 Party wall between dwell | | | | pendently assessed | 2.70 | 0.03 | 0.03 | Knauf | | | No |
| E25 Staggered party wall bety | | | | pendently assessed | 2.70 | 0.09 | 0.09 | Knauf | | | No |
| P3 Party wall - Intermediate fl (in blocks of flats) | loor between | aweilings | iabii | e K1 - Default | 11.16 | 0.00 | 0.00 | Default | | | No |
| E17 Corner (inverted – internal | al area greate | er than | Inde | pendently assessed | 2.70 | -0.09 | -0.09 | Knauf | | | No |
| external area) E8 Balcony within a dwelling, continuous | wall insulation | on | Table | e K1 - Default | 2.40 | 0.10 | 0.10 | Default | | | No |
| Y-value | | | | 0.07 | | | | W/m²K | | | |
| 18.0 Pressure Testing | | | | Yes | | | | | | | |
| Designed AP ₅₀ | | | İ | 3.00 | | | | m³/(h.n | n²) @ 50 P | а | |
| Property Tested? | | | i | Yes | | | | = ` | , 0 | | |
| Test Method | | | ľ | Blower Door | | | | ╡ | | | |
| As Built AP ₅₀ | | | | 0.10 | | | | m³/(h.n | n²) @ 50 Pa | а | |
| 9.0 Mechanical Ventilation | | | - 1 | | | | | | | | |
| Mechanical Ventilation | | | | | | | | | | | |
| Mechanical Ventilation S | System Prese | ent | | Yes | | | | | | | |
| Approved Installation | | | ĺ | No | | | | | | | |
| Mechanical Ventilation | data Type | | i | Database | | | | <u> </u> | | | |
| Туре | | | ĺ | Balanced mechanical ver | ntilation with h | eat recove | ry | | | | |
| MV Reference Number | | | | 500082 | | | | | | | |
| Configuration | | | j | 1 | | | | | | | |
| Manufacturer SFP | | | İ | 0.73 | | | | $\bar{\Box}$ | | | |
| Duct Type | | | İ | Rigid | | | | $\bar{\Box}$ | | | |
| MVHR Efficiency | | | | 90.00 | | | | ī | | | |
| Wet Rooms | | | ĺ | 1 | | | | Ħ | | | |
| SFP from Installer Com | missionina C | ertificate | [| No | | | | Ħ | | | |
| S Hom motalion dolli | g O | | l | | | | | = | | | |
| MVHR System Location | า | | - 1 | Inside heated envelope (| installed evelu | ISIVEIVI | | | | | |
| MVHR System Location Duct Installation Specifi | | | | Inside heated envelope (i | installed exclu | isively) | | \dashv | | | |

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| 21.0 Fixed Cooling System | No | | | | |
|--|---------------------------|--------------------|------------------------------|----------------------|-------------------|
| 22.0 Lighting | | | | | |
| No Fixed Lighting | No | | | | |
| | Name Lighting 1 | Efficacy 80.00 | Power 6 | Capacity 480 | Count 10 |
| 24.0 Main Heating 1 | SAP table | | | | |
| Percentage of Heat | 100.00 | | | % | |
| Database Ref. No. | 0 | | | | |
| Fuel Type | Electricity | | | | |
| SAP Code | 224 | | | | |
| In Winter | 170.00 | | | | |
| In Summer | 170.00 | | | | |
| Controls SAP Code | 2207 | | | | |
| Delayed Start Stat | No | | | | |
| HETAS approved System | No | | | | |
| Oil Pump Inside | No | | | | |
| Fan Assisted Flue | No | | | | |
| Is MHS Pumped | Pump in heated s | pace | | | |
| Heating Pump Age | 2013 or later | | | | |
| Heat Emitter | Radiators | | | | |
| Flow Temperature | Enter value | | | | |
| Flow Temperature Value | 45.00 | | | Ħ | |
| Boiler Interlock | No | | | | |
| OF O Main Heating 2 | None | | | | |
| 25.0 Main Heating 2 | None | | | | |
| 26.0 Heat Networks | None | | | | |
| Heat Source Fuel Type Heating I | Jse Efficiency | Percentage Of Heat | eat Heat E Power Ratio | lectrical Fuel Facto | r Efficiency type |
| Heat source 1 None Heat source 2 None | | | Ratio | | |
| Heat source 3 None | | | | | |
| Heat source 4 None Heat source 5 None | | | | | |
| 28.0 Water Heating | | | | | |
| Water Heating | Main Heating 1 | | | | |
| SAP Code | 901 | | | | |
| Flue Gas Heat Recovery System | No | | | | |
| Waste Water Heat Recovery Instantaneous System 1 | No | | | | |
| Waste Water Heat Recovery Instantaneous System 2 | No | | | | |
| Waste Water Heat Recovery Storage System | No | | | | |
| Solar Panel | No | | | | |
| Water use <= 125 litres/person/day | Yes | | | | |
| Summer Immersion | No | | | | |
| Cold Water Source | | | | | |
| | From mains | | | Ī | |
| Bath Count | From mains | | | | |
| Bath Count Supplementary Immersion | | | | | |
| | 1 | | | | |
| Supplementary Immersion Immersion Only Heating Hot Water | 1 No | | | | |
| Supplementary Immersion Immersion Only Heating Hot Water 28.3 Waste Water Heat Recovery System | 1 No No | er | | | |
| Supplementary Immersion Immersion Only Heating Hot Water 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder | 1 No | er - | | | |
| Supplementary Immersion Immersion Only Heating Hot Water 28.3 Waste Water Heat Recovery System | 1 No No Hot Water Cylinde | 9F | | | |

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| Jan Fe | b Mar | Apr | May Jun | Jul | Aug | Sep | Oc | t Nov | Dec |
|------------------------|-----------------------|-----------|----------------------|---------------|-----------------|----------------|---------------|---------------------------------|-----------------------|
| Electricity Generation | ı | | Annual | | | | | | |
| Connected to dwelling | g's electricity meter | | Yes | | | | | | |
| Apportioned | | | 0.00 | | | | kWh/Ye | ear | |
| Electricity Generated | | | 0.00 | | | | | | |
| 34.0 Small-scale Hydro | | | None | | | | | | |
| 0.80 | South | 30° | None Or Little | No | No | 1.00 | | Reference | |
| PV Cells kWp | Orientation | Elevation | Overshading | FGHRS | MCS Certificate | Over: Facto | shading or | MCS Certificate Reference | Panel Manufacturer |
| Battery Capacity [kW | h] | | 0.00 | | | | | | |
| Diverter | | | No | | | | | | |
| Connected To Dwelli | ng | | Yes | | | | | | |
| Export Capable Mete | r? | | Yes | | | | | | |
| 32.0 Photovoltaic Unit | | | Multiple Dwellings - | - Connected | | | | | |
| 31.0 Thermal Store | | | None | | | | | | |
| In Airing Cupboard | | | No | | | | | | |
| Pipes insulation | | | Fully insulated prim | nary pipework | | | | | |
| Loss | | | 1.70 | | | | kWh/da | ay | |
| Cylinder Volume | | | 150.00 | | | | L | | |
| Insulation Type | | | Measured Loss | | | | | | |
| Independent Time Co | ontrol | | Yes | | | | | | |

Recommendations

Lower cost measures

Further measures to achieve even higher standards None

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Predicted Energy Assessment



Flat 1, Luton, Bedfordshire, LU1 3HX

Dwelling type:
Date of assessment:
Produced by:
Total floor area:
DRRN:

Flat, Semi-Detached 05/07/2023 Darren Coham 53.7 m²

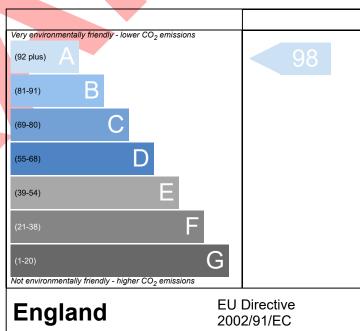
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Very energy efficient - lower running costs (92 plus) A (81-91) B (69-80) C (55-68) (1-20) F Not energy efficient - higher running costs England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

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Thermal Bridging



| Property Reference | Flat 1 | | | | Issued on Date | 05/07/2023 | |
|------------------------------------|--------------------------|--------------------------------------|--------------|----------|--------------------|------------|--|
| Assessment Reference | 00001 | | Prop | Type Ref | Semi-Detached Flat | | |
| Property | Flat 1, Luton, Bedfordsh | Flat 1, Luton, Bedfordshire, LU1 3HX | | | | | |
| SAP Rating | | 88 B | DER | 3.11 | TER | 16.32 | |
| Environmental | | 98 A | % DER < TER | | | 80.94 | |
| CO ₂ Emissions (t/year) | | 0.15 | DFEE | 36.38 | TFEE | 38.88 | |
| Compliance Check | | See BREL | % DFEE < TFE | Ē | | 6.42 | |
| % DPER < TPER | | 58.28 | DPER | 36.82 | TPER | 88.27 | |
| Assessor Details | Mr. Darren Coham | | | | Assessor ID | R789-0001 | |
| Client | | | | | | | |

| | Junction details | Source Type | Psi (W/mK) | Length (m) | Result | Reference |
|------------------|---|------------------------|---------------|---------------|--------|---------------------|
| External wall | E1 Steel lintel with perforated steel base plate | Independently assessed | 0.068 | 6.72 | 0.46 | Thermally Broken |
| External wall | E4 Jamb | Independently assessed | 0.018 | 18.50 | 0.33 | Knauf |
| External wall | E7 Party floor between dwellings (in blocks of flats) | Independently assessed | 0.065 | 65.04 | 4.23 | Knauf |
| External wall | E16 Corner (normal) | Independently assessed | 0.048 | 10.80 | 0.52 | Knauf |
| External wall | E18 Party wall between dwellings | Independently assessed | 0.069 | 2.70 | 0.19 | Knauf |
| External wall | E25 Staggered party wall between dwellings | Independently assessed | 0.088 | 2.70 | 0.24 | Knauf |
| Party wall | P3 Party wall - Intermediate floor between dwellings (in blocks of flats) | Table K1 - Default | 0.000 | 11.16 | 0.00 | Default |
| External wall | E17 Corner (inverted – internal area greater than external area) | Independently assessed | -0.090 | 2.70 | -0.24 | Knauf |
| External wall | E8 Balcony within a dwelling, wall insulation continuous | Table K1 - Default | 0.100 | 2.40 | 0.24 | Default |

Total: 122.72 W/mK: Y-Value: 0.07 W/m²K:

SAP 10 Online 2.7.11 Page 1 of 1

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 05 Jul 2023 11:45:14

| Project Information | | | | | | | |
|---------------------|--------------|-----------------|-------------------|--|--|--|--|
| Assessed By | Darren Coham | Building Type | Flat, End-terrace | | | | |
| OCDEA Registration | EES/022007 | Assessment Date | 2023-07-05 | | | | |

| Dwelling Details | | | | | | | | |
|------------------|------------------------|------------------|-------------------|--|--|--|--|--|
| Assessment Type | As designed | Total Floor Area | 97 m ² | | | | | |
| Site Reference | Flat 2 | Plot Reference | 00002 | | | | | |
| Address | Flat 2, Luton, LU1 3HX | • | • | | | | | |

| Client Details | |
|----------------|------|
| Name | |
| Company | |
| Address | 5555 |

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 | 12.57 kgCO ₂ /m ² | | | | | |
| Dwelling carbon dioxide emission rate | 2.86 kgCO ₂ /m ² | OK | | | | |
| 1b Target primary energy rate and dwelling primary energy | | | | | | |
| Target primary energy | 67.46 kWh _{PE} /m ² | | | | | |
| Dwelling primary energy | 31.89 kWh _{PE} /m ² | OK | | | | |
| 1c Target fabric energy efficiency and dwelling | fabric energy efficiency | | | | | |
| Target fabric energy efficiency | 35.4 kWh/m ² | | | | | |
| Dwelling fabric energy efficiency | 33.7 kWh/m ² | OK | | | | |

| 2a Fabric U-values | | | | | | | |
|--------------------|---|---|---|-----|--|--|--|
| Element | Maximum permitted average U-Value [W/m²K] | 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 | 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, | 1.6 | 1.18 | pd1 (1.2) | ОК | | | |
| and roof windows | | | | | | | |
| 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) | 59.48 | 0.18 | | | | | |
| Sheltered wall: Walls (2) | 26.6649 | 0.18 | | | | | |
| Party wall: Party Wall (1) | 20.52 | 0 (!) | | | | | |

| 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] | | | |
| pd1, Windows | 5.4 | North West | 0.75 | 1.2 | | | |
| pd1, Windows | 5.4 | North West | 0.75 | 1.2 | | | |
| w1, Windows | 3.24 | North West | 0.75 | 1.2 | | | |
| w2, Windows | 6.48 | North West | 0.75 | 1.2 | | | |
| ed1, Entrance Doors | 2.0951 | South East | N/A | 1 (!) | | | |
| w3, Windows | 5.04 | South East | 0.75 | 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 | Drawing / |
| | | | [W/mK] | reference |
| External wall | E1: Steel lintel with perforated | Calculated by person with suitable | 0.068 | Thermally |
| | steel base plate | expertise | | Broken |
| External wall | E4: Jamb | Calculated by person with suitable | 0.018 (!) | Knauf |
| | | | | |

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Date generated: 2023-07-05 11:45:14

| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
|---------------|-----------------------------------|------------------------------------|---------------------|---------------------|
| | | expertise | | |
| External wall | E7: Party floor between dwellings | Calculated by person with suitable | 0.065 | Knauf |
| | (in blocks of flats) | expertise | | |
| External wall | E16: Corner (normal) | Calculated by person with suitable | 0.048 | Knauf |
| | | expertise | | |
| External wall | E18: Party wall between dwellings | Calculated by person with suitable | 0.069 | Knauf |
| | | expertise | | |
| External wall | E8: Balcony within a dwelling - | SAP table default | 0.1 | |
| | wall insulation continuous | | | |
| Party wall | P3: Intermediate floor between | SAP table default | 0 (!) | |
| | dwellings (in blocks of flats) | | | |
| External wall | E17: Corner (inverted - internal | Calculated by person with suitable | -0.09 | Knauf |
| | area greater than external area) | expertise | | |

| 3 Air permeability (better than typically expected values are flagged with a subsequent (!)) | | | |
|--|--|----|--|
| Maximum permitted air permeability at 50Pa | 8 m³/hm² | | |
| 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 | 219.3% | |
| Emitter type | Radiators | |
| Flow temperature | 45°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 | 150 litres | | |
| Declared heat loss | 1.7 kWh/day | | |
| Primary pipework insulated | Yes | | |
| Manufacturer | | | |
| Model | | | |
| Commissioning | | | |
| Waste water heat recovery system 1 - type: N/A | | | |
| Efficiency | | | |
| Manufacturer | | | |
| Model | | | |

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

| 7 Lighting | | |
|---|---------|----|
| Minimum permitted light source efficacy | 75 lm/W | |
| Lowest light source efficacy | 80 lm/W | OK |
| External lights control | N/A | |

| 8 Mechanical ventilation | | | |
|---|-------------------------|---|----|
| System type: Balanced whole-house me | echanical ventilation v | with heat recovery | |
| Maximum permitted specific fan power | 1.5 W/(l/s) | | |
| Specific fan power | 0.73 W/(l/s) | | OK |
| Minimum permitted heat recovery | 73% | | |
| efficiency | | | |
| Heat recovery efficiency | 90% | | OK |
| Manufacturer/Model | HRV1 Q Plus | | |
| Commissioning | | | |
| 9 Local generation | | | |
| Technology type: Photovoltaic system | (1) | | |
| Peak power | 0.8 kWp | | |
| Orientation | South | | |
| Pitch | 30° | | |
| Overshading | None or very little | | |
| Manufacturer | Trong of vory little | | |
| MCS certificate | | | |
| | | | |
| 10 Heat networks | | | |
| N/A | | | |
| 11 Supporting documentary evidence | | | |
| N/A | | | |
| 40 D 11 | | | |
| 12 Declarations | | | |
| a. Assessor Declaration | | stanta of this DDEL Compliance Depart | |
| | | Intents of this BREL Compliance Report of the submitted for this dwelling for | |
| | | <u> </u> | |
| the purpose of carrying out the "As de evidence (SAP Conventions, Appendi | | | |
| documentary evidence required) has | | | |
| Compliance Report. | been reviewed in the | course of preparing this BNEL | |
| Compliance Report. | | | |
| | | | |
| Signed: | | Assessor ID: | |
| Oigneu. | | A3363301 ID. | |
| | | | |
| Name: | | Date: | |
| radiio. | | Daic. | |

b. Client Declaration

N/A



| Property Reference | Flat | 2 | | | | | | | | Issu | ed on Da | ite | 05/07/20 |)23 |
|--|---|--|--|---|---|-----------------------|---|----------------------------|----------------------|--|--|--------|---|---|
| Assessment Reference | 000 | 02 | | | | | Prop | Type I | Ref | Flat | | | | |
| Property | Flat | 2, Luton, | Bedfordshi | re, LU1 3HX | | | | | | | | | | |
| SAP Rating | | | | 87 B | | DER | | 2.86 | | | TER | | 12.57 | 7 |
| Environmental | | | | 98 A | | % DER | < TER | | | | | | 77.25 | 5 |
| CO ₂ Emissions (t/year) | | | | 0.25 | | DFEE | | 33.6 | 7 | | TFEE | | 35.44 | 1 |
| Compliance Check | | | | See BREL | | % DFE | E < TFEE | | | | | | 4.98 | |
| % DPER < TPER | | | | 52.73 | | DPER | | 31.8 | 9 | | TPER | | 67.46 | 3 |
| Assessor Details | Mr. Darre | en Coham | l | | | | | | | | Assess | or ID | R789 | 9-0001 |
| Client | | | | | | | | | | | | | | |
| SUMMARY FOR INPU | JT DATA F | OR: Nev | v Build (A | As Designe | d) | | | | | | | | | |
| Orientation | | | | Southeast | | | | | | | | | | |
| Property Tenture | | | | ND | | | | | | \equiv | | | | |
| Transaction Type | | | | 6 | | | | | | | | | | |
| Terrain Type | | | | Urban | | | | | | | | | | |
| 1.0 Property Type | | | | Flat, End-Ter | race | | | | | | | | | |
| Position of Flat | | | | Mid-floor flat | | | | | | | | | | |
| Which Floor | | | | 2 | | | | | | | | | | |
| 2.0 Number of Storeys | | | | 1 | | | | | | | | | | |
| 3.0 Date Built | | | | 2023 | | | | | | | | | | |
| 4.0 Sheltered Sides | | | | 2 | | | | | | | | | | |
| 5.0 Sunlight/Shade | | | | Average or u | ınknown | | | | | | | | | |
| 6.0 Thermal Mass Param | otor | | | Precise calcu | | | | | | | | | | |
| Thermal Mass | oto: | | | N/A | ulation | | | | | | kJ/m²K | | | |
| | | | | | | | | | | | | | | |
| 7.0 Electricity Tariff | | | | Standard | | | | | | | | | | |
| Smart electricity meter | fitted | | | Yes | | | | | | | | | | |
| Smart gas meter fitted | | | | Yes | | | | | | | | | | |
| 7.0 Measurements | | | | Grou 1s 2n 3r 4t 56 6t 7t | asement and floor of Storey d Storey d Storey h Storey h Storey h Storey | : : : : : | 0.00 m 42.15 n 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m | 1 n 1 1 1 1 | r In | 0.00 97.2 0.00 0.00 0.00 0.00 0.00 | Floor Area) m² 0 m² 0 m²) m²) m²) m²) m²) m²) m²) m²) | а А | 0.0 2.7 0.0 0.0 0.0 0.0 0.0 | torey Heigh 00 m 70 m 00 m 00 m 00 m 00 m 00 m 00 m |
| 8.0 Living Area | | | | 37.01 | | | | | | | m² | | | |
| | · · · · · · · · · · · · · · · · · · · | Constr | uction | | | | (kJ/m²K) | Area(m²) | Nett Area (m²) | Res | Shelt | | | Area Calculatio |
| Description | Туре | | | | C block, | 0.18 | 60.00 | 85.05 28.76 | 59.49 26.66 | 0.00 | Non Stairwell A Corrido | Access | | alculate Wall A Enter Gross Are |
| | Type Cavity Wall Cavity Wall | filled ca Cavity | wall : plasterb avity, any outs wall : plasterb avity, any outs | ide structure oard on dabs, AA0 | C block, | 0.18 | 60.00 | | | | Coma | | | |
| External Wall 1 | Cavity Wall | filled ca Cavity | vity, any outs wall : plasterb | ide structure oard on dabs, AA0 ide structure | C block, | 0.18 | 60.00 | | U-Value | | a Area | a She | elter | Shelter |
| Description External Wall 1 Sheltered Wall 9.1 Party Walls | Cavity Wall Cavity Wall Type | filled ca Cavity filled ca | vity, any outs wall: plasterb avity, any outs Construct Plasterbo | ide structure oard on dabs, AA0 ide structure | ounted o | | | | (W/m ² K) | | a Area K) (m²) | a She | elter les .00 | Shelter None |
| Description External Wall 1 Sheltered Wall 9.1 Party Walls Description | Cavity Wall Cavity Wall Type Filled Ca | filled ca Cavity filled ca avity with ealing | vity, any outs wall: plasterb avity, any outs Construct Plasterbo | ide structure coard on dabs, AAC de structure ction ard on dabs m C blocks, cavit | ounted o | | | | (W/m ² K) |) (kJ/m² | a Area K) (m²) | a She | les | None Area (m |



| Description | | Constr | uction | | | | | | Kappa (kJ/m²K) | Area (m |
|---|--|----------------------|---|------------------------|-----------------------|--------------------------|---------------------|------------------|-------------------|-------------------|
| Party Ceiling 1 | | Precast | t concrete plank floor (screed | l laid on insulat | ion), carpe | ted | | | 30.00 | 97.20 |
| 11.1 Party Floors | | | | | | | | | | |
| Description | | Storey Index | Construction | | | | | | Kappa (kJ/m²K) | |
| Party Floor 1 | | Lowest occupied | Precast concrete plank floor | (screed laid or | n insulation | ı), carpeted | | | 30.00 | 97.20 |
| 12.0 Opening Types | | _ | . . | | . | | | _ | _ | |
| Description | Data Source | Туре | Glazing | | Glazing Gap | Filling Type | G-value | Frame Type | Frame Factor | U Value (W/m²K |
| Entrance Doors Windows | Manufacturer Manufacturer | Solid Door Window | Double Low-E So | oft 0.05 | | Air Filled Air Filled | 0.00 0.63 | Wood Wood | 0.70 0.75 | 1.00 1.20 |
| 13.0 Openings | | | | | | | | | | |
| Name | Opening Typ | ое | Location | | Orient | | | a (m²) | | itch |
| pd1 w1 | Windows Windows | | External Wall 1 External Wall 1 | | North North | | |).80 .24 | | 0 |
| w2 | Windows Entrance Do | oro | External Wall 1 Sheltered Wall | | North South | | | .48 .10 | | 0 |
| ed1 w3 | Windows | ors | External Wall 1 | | South | | | .04 | | 0 |
| 14.0 Conservatory | | | None | | | | | | | |
| 15.0 Draught Proofing | | | 100 | | | | % | | | |
| 16.0 Draught Lobby | | | No | | | | | | | |
| | | | | | | | | | | |
| 17.0 Thermal Bridging | | | Calculate Bridges | | | | | | | |
| 17.1 List of Bridges | | | Source Type | Longth | Psi | Adjusted | Poforono | | | Importe |
| Bridge Type E1 Steel lintel with perfo | orated steel base pl | late | Independently assessed | Length 11.67 | 0.07 | 0.07 | Thermall | | | Yes |
| E4 Jamb | · | | Independently assessed | 28.10 | 0.02 | 0.02 | Knauf | , | | Yes |
| E7 Party floor between E16 Corner (normal) | dwellings (in blocks | s of flats) | Independently assessed Independently assessed | 84.30 13.50 | 0.07 0.05 | 0.07 0.05 | Knauf Knauf | | | No No |
| | describber our | | | | 0.07 | 0.07 | Knauf | | | Yes |
| E18 Party wall between | aweilings | | Independently assessed | 5.40 | 0.07 | 0.07 | Itilaai | | | |
| E8 Balcony within a dwe | | n | Table K1 - Default | 5.40 4.70 | 0.10 | 0.10 | raidai | | | No |
| E8 Balcony within a dwe continuous | elling, wall insulatio | | Table K1 - Default | 4.70 | 0.10 | 0.10 | Tuluul | | | |
| E8 Balcony within a dwe | elling, wall insulatio | | | | | | Tuldu | | | No No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed | elling, wall insulatio | dwellings | Table K1 - Default | 4.70 | 0.10 | 0.10 | Knauf | | | |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default | 4.70 15.20 | 0.10 | 0.10 | | K | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed | 4.70 15.20 | 0.10 | 0.10 | Knauf | ĸ | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² | | Pa | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² | K .m²) @ 50 F | ² a | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² | | ² a | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP50 Property Tested? | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed APso Property Tested? Test Method As Built APso 19.0 Mechanical Ventilation | elling, wall insulatio | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed APso Property Tested? Test Method As Built APso 19.0 Mechanical Ventilation | elling, wall insulation diate floor between internal area greate internal area greate on a second control of the control of th | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation | elling, wall insulation diate floor between internal area greate internal area greate on a construction on a construction System Presection | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed APso Property Tested? Test Method As Built APso 19.0 Mechanical Ventilation Mechanical Ventilation Approved Installat | elling, wall insulation diate floor between internal area greate internal area greate on a construction on a construction System Presection | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Approved Installation | elling, wall insulation diate floor between diate floor between diate floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal floor between diater | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Approved Installation Mechanical Ventilation Mechanical Ventilation Approved Installation Mechanical Ventilation | elling, wall insulation diate floor between diate floor between diate floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal floor between diater | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical versions assessed | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical versions assessed | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Type MV Reference Nu Configuration | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical visions 20082 1 | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Manufacturer SFF | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vi 500082 1 0.73 | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Type MV Reference Nu Configuration Manufacturer SFF Duct Type | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vi 500082 1 0.73 Rigid | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical V | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vi 500082 1 0.73 Rigid | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical V | on n ation System Presection ation data Type mber c Commissioning Co | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vectors 500082 1 0.73 Rigid 90.00 1 | 4.70 15.20 10.80 | 0.10 0.00 -0.09 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |



| 21.0 Fixed Cooling System | No | | | | |
|--|--------------------|-------------------|-------------------|---------------------|--------------------|
| 22.0 Lighting | | | | | |
| No Fixed Lighting | No | | | | |
| | Name Lighting 1 | Efficacy 80.00 | Power 6 | Capacity 480 | Count 10 |
| 24.0 Main Heating 1 | SAP table | | | | |
| Percentage of Heat | 100.00 | | | % | |
| Database Ref. No. | 0 | | | | |
| Fuel Type | Electricity | | | | |
| SAP Code | 224 | | | | |
| In Winter | 170.00 | | | | |
| In Summer | 170.00 | | | | |
| Controls SAP Code | 2207 | | | | |
| Delayed Start Stat | No | | | | |
| HETAS approved System | No | | | | |
| Oil Pump Inside | No | | | | |
| Fan Assisted Flue | No | | | | |
| Is MHS Pumped | Pump in heated | l space | | | |
| Heating Pump Age | 2013 or later | | | | |
| Heat Emitter | Radiators | | | | |
| Flow Temperature | Enter value | | | | |
| Flow Temperature Value | 45.00 | | | | |
| Boiler Interlock | No | | | | |
| 25.0 Main Heating 2 | None | | | | |
| 26.0 Heat Networks | None | | | | |
| Heat Source Fuel Type Heating Us | se Efficiency | | | ectrical Fuel Facto | r Efficiency type |
| | | Heat | Power Ratio | | |
| Heat source 1 None Heat source 2 None | | | | | |
| Heat source 3 None Heat source 4 None | | | | | |
| Heat source 5 None | | | | | |
| 28.0 Water Heating | | | | | |
| Water Heating | Main Heating 1 | | | | |
| SAP Code | 901 | | | | |
| Flue Gas Heat Recovery System | No | | | | |
| Waste Water Heat Recovery Instantaneous System 1 | No | | | | |
| Waste Water Heat Recovery Instantaneous System 2 | No | | | | |
| Waste Water Heat Recovery Storage System | No | | | | |
| Solar Panel | No | | | | |
| Water use <= 125 litres/person/day | Yes | | | | |
| Summer Immersion | No | | | | |
| Cold Water Source | From mains | | | | |
| Bath Count | 1 | | | | |
| Supplementary Immersion | No | | | | |
| Immersion Only Heating Hot Water | No | | | | |
| 28.3 Waste Water Heat Recovery System | | | | | |
| 29.0 Hot Water Cylinder | Hot Water Cylin | der | | | |
| Cylinder Stat | Yes | | | | |
| Cylinder In Heated Space | Yes | | | | |
| | | | | | |



| Jan Fe | b Mar | Apr | May Jun | Jul | Aug | Sep | Oc | t Nov | Dec |
|------------------------|-----------------------|-----------|----------------------|---------------|-----------------|----------------|---------------|---------------------------------|-----------------------|
| Electricity Generation | ı | | Annual | | | | | | |
| Connected to dwelling | g's electricity meter | | Yes | | | | | | |
| Apportioned | | | 0.00 | | | | kWh/Ye | ear | |
| Electricity Generated | | | 0.00 | | | | | | |
| 34.0 Small-scale Hydro | | | None | | | | | | |
| 0.80 | South | 30° | None Or Little | No | No | 1.00 | | Reference | |
| PV Cells kWp | Orientation | Elevation | Overshading | FGHRS | MCS Certificate | Over: Facto | shading or | MCS Certificate Reference | Panel Manufacturer |
| Battery Capacity [kW | h] | | 0.00 | | | | | | |
| Diverter | | | No | | | | | | |
| Connected To Dwelli | ng | | Yes | | | | | | |
| Export Capable Mete | r? | | Yes | | | | | | |
| 32.0 Photovoltaic Unit | | | Multiple Dwellings - | - Connected | | | | | |
| 31.0 Thermal Store | | | None | | | | | | |
| In Airing Cupboard | | | No | | | | | | |
| Pipes insulation | | | Fully insulated prim | nary pipework | | | | | |
| Loss | | | 1.70 | | | | kWh/da | ay | |
| Cylinder Volume | | | 150.00 | | | | L | | |
| Insulation Type | | | Measured Loss | | | | | | |
| Independent Time Co | ontrol | | Yes | | | | | | |

Recommendations

Lower cost measures

Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 2, Luton, Bedfordshire, LU1 3HX

Dwelling type:
Date of assessment:
Produced by:
Total floor area:
DRRN:

Flat, End-Terrace 05/07/2023 Darren Coham 97.2 m²

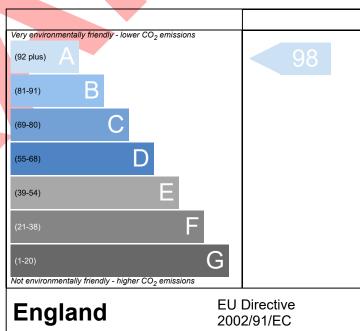
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Very energy efficient - lower running costs (92 plus) A (81-91) B (69-80) C (55-68) (1-20) F Not energy efficient - higher running costs England Eu Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

Thermal Bridging



| Property Reference | Flat 2 | | | | Issued on Date | 05/07/2023 |
|------------------------------------|--------------------------|--------------|-------------|-------------|------------------|------------|
| Assessment Reference | 00002 | | Pr | op Type Ref | End-Terrace Flat | |
| Property | Flat 2, Luton, Bedfordsh | ire, LU1 3HX | | | | |
| SAP Rating | | 87 B | DER | 2.86 | TER | 12.57 |
| Environmental | | 98 A | % DER < TER | ₹ | | 77.25 |
| CO ₂ Emissions (t/year) | | 0.25 | DFEE | 33.67 | TFEE | 35.44 |
| Compliance Check | | See BREL | % DFEE < TF | EE | | 4.98 |
| % DPER < TPER | | 52.73 | DPER | 31.89 | TPER | 67.46 |
| Assessor Details | Mr. Darren Coham | | | | Assessor ID | R789-0001 |
| Client | | | | | | |

| | Junction details | Source Type | Psi (W/mK) | Length (m) | Result | Reference |
|------------------|---|------------------------|---------------|---------------|--------|---------------------|
| External wall | E1 Steel lintel with perforated steel base plate | Independently assessed | 0.068 | 11.67 | 0.79 | Thermally Broken |
| External wall | E4 Jamb | Independently assessed | 0.018 | 28.10 | 0.51 | Knauf |
| External wall | E7 Party floor between dwellings (in blocks of flats) | Independently assessed | 0.065 | 84.30 | 5.48 | Knauf |
| External wall | E16 Corner (normal) | Independently assessed | 0.048 | 13.50 | 0.65 | Knauf |
| External wall | E18 Party wall between dwellings | Independently assessed | 0.069 | 5.40 | 0.37 | Knauf |
| External wall | E8 Balcony within a dwelling, wall insulation continuous | Table K1 - Default | 0.100 | 4.70 | 0.47 | |
| Party wall | P3 Party wall - Intermediate floor between dwellings (in blocks of flats) | Table K1 - Default | 0.000 | 15.20 | 0.00 | |
| External wall | E17 Corner (inverted – internal area greater than external area) | Independently assessed | -0.090 | 10.80 | -0.97 | Knauf |

Total: 173.67 W/mK:
Y-Value: 0.06 W/m²K:

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 05 Jul 2023 11:45:14

| Project Information | | | |
|---------------------|--------------|-----------------|-------------------|
| Assessed By | Darren Coham | Building Type | Flat, Mid-terrace |
| OCDEA Registration | EES/022007 | Assessment Date | 2023-07-05 |

| Dwelling Details | | | |
|-------------------------|------------------------|------------------|-------------------|
| Assessment Type | As designed | Total Floor Area | 68 m ² |
| Site Reference | Flat 3 | Plot Reference | 00003 |
| Address | Flat 3, Luton, LU1 3HX | • | • |

| Client Details | |
|----------------|------|
| Name | |
| Company | |
| Address | 5555 |

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

| 1a Target emission rate and dwelling emission | rate | |
|---|---|----|
| Fuel for main heating system | Electricity | |
| Target carbon dioxide emission rate | 13.18 kgCO ₂ /m ² | |
| Dwelling carbon dioxide emission rate | 2.73 kgCO ₂ /m ² | OK |
| 1b Target primary energy rate and dwelling prin | nary energy | |
| Target primary energy | 71.09 kWh _{PE} /m ² | |
| Dwelling primary energy | 31.86 kWh _{PE} /m ² | OK |
| 1c Target fabric energy efficiency and dwelling | fabric energy efficiency | |
| Target fabric energy efficiency | 30.2 kWh/m ² | |
| Dwelling fabric energy efficiency | 29.5 kWh/m ² | OK |

| 2a Fabric U-values | | | | | | | | |
|--------------------|---|---|---|-----|--|--|--|--|
| Element | Maximum permitted average U-Value [W/m²K] | 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 | 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, | 1.6 | 1.18 | pd1 (1.2) | OK | | | | |
| and roof windows | | | | | | | | |
| 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 | | | | | | | |
| Sheltered wall: Walls (2) | 2.6349 | 0.18 | | | | | | | |
| Party wall: Party Wall (1) | 23.9 | 0 (!) | | | | | | | |

| 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] | | | | | |
| pd1, Windows | 5.4 | North West | 0.75 | 1.2 | | | | | |
| w1, Windows | 6.48 | North West | 0.75 | 1.2 | | | | | |
| w2, Windows | 5.04 | North East | 0.75 | 1.2 | | | | | |
| ed1, Entrance Doors | 2.0951 | South East | N/A | 1 (!) | | | | | |

| Building part 1 - | Main Dwelling: Thermal bridging of | calculated from linear thermal transmit | tances for eac | h junction |
|-------------------|---|--|---------------------|---------------------|
| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
| External wall | E1: Steel lintel with perforated steel base plate | Calculated by person with suitable expertise | | Thermally Broken |
| External wall | E4: Jamb | Calculated by person with suitable expertise | 0.018 (!) | Knauf |

Date generated: 2023-07-05 11:45:14

| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
|---------------|---|--|---------------------|---------------------|
| External wall | E7: Party floor between dwellings (in blocks of flats) | Calculated by person with suitable expertise | 0.065 | Knauf |
| External wall | E18: Party wall between dwellings | Calculated by person with suitable expertise | 0.069 | Knauf |
| External wall | E8: Balcony within a dwelling - wall insulation continuous | SAP table default | 0.1 | |
| Party wall | P3: Intermediate floor between dwellings (in blocks of flats) | SAP table default | 0 (!) | |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.09 | Knauf |
| External wall | E16: Corner (normal) | Calculated by person with suitable expertise | 0.048 | Knauf |

| 3 Air permeability (better than typically expected values are flagged with a subsequent (!)) | | | | | | | | |
|--|--|----|--|--|--|--|--|--|
| Maximum permitted air permeability at 50Pa | 8 m³/hm² | | | | | | | |
| 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 | 219.3% | | | | | | |
| Emitter type | Underfloor | | | | | | |
| Flow temperature 45°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 | 150 litres | | | | | |
| Declared heat loss | 1.7 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 tempera | ature zone control by arrangement of plumbing and electrical services |
| Function | |
| Ecodesign class | |
| Manufacturer | |
| Model | |
| Water heating - type: Cylinder thermosta | at and HW separately timed |
| Manufacturer | |
| Model | |

| 7 Lighting | | |
|---|---------|----|
| Minimum permitted light source efficacy | 75 lm/W | |
| Lowest light source efficacy | 80 lm/W | OK |
| External lights control | N/A | |

| 8 Mechanical ventilation | | | |
|---|-------------------------|---|----|
| System type: Balanced whole-house me | echanical ventilation v | with heat recovery | |
| Maximum permitted specific fan power | 1.5 W/(l/s) | | |
| Specific fan power | 0.73 W/(l/s) | | OK |
| Minimum permitted heat recovery | 73% | | |
| efficiency | | | |
| Heat recovery efficiency | 90% | | OK |
| Manufacturer/Model | HRV1 Q Plus | | |
| Commissioning | | | |
| 9 Local generation | | | |
| Technology type: Photovoltaic system | (1) | | |
| Peak power | 0.8 kWp | | |
| Orientation | South | | |
| Pitch | 30° | | |
| Overshading | None or very little | | |
| Manufacturer | Trong of vory little | | |
| MCS certificate | | | |
| | | | |
| 10 Heat networks | | | |
| N/A | | | |
| 11 Supporting documentary evidence | | | |
| N/A | | | |
| 40 D | | | |
| 12 Declarations | | | |
| a. Assessor Declaration | | stanta of this DDEL Compliance Depart | |
| | | Intents of this BREL Compliance Report of the submitted for this dwelling for | |
| | | <u> </u> | |
| the purpose of carrying out the "As de evidence (SAP Conventions, Appendi | | | |
| documentary evidence required) has | | | |
| Compliance Report. | been reviewed in the | course of preparing this BNEL | |
| Compliance Report. | | | |
| | | | |
| Signed: | | Assessor ID: | |
| Oigneu. | | A3363301 ID. | |
| | | | |
| Name: | | Date: | |
| radiio. | | Daic. | |

b. Client Declaration

N/A



| Property Reference | Flat 3 | 3 | | Issu | | | | | | Issued on Date 0 | | | 05/07/2023 | | |
|--|--|--|---|---|--|-------------------------|---|---------------------------|--|--|--|-----------------------|--|---------------------------------|--|
| Assessment Reference | 0000 | 3 | | | | | Prop | Type I | Ref | Flat | | | | | |
| Property | Flat 3 | , Luton, E | Bedfordshi | re, LU1 3H | X | | | | | | | | | | |
| SAP Rating | | | | 89 B | | DER | | 2.73 | | | TER | | 13.18 | | |
| Environmental | | | | 98 A | | % DER | % DER < TER | | | | 79.29 | | | | |
| CO ₂ Emissions (t/year) | | | | 0.17 | | DFEE 29.52 | | | TFEE | | | | | | |
| Compliance Check | | | | See BRE | L | % DFE | DFEE < TFEE | | | | | | | | |
| % DPER < TPER | | | | 55.19 | | DPER | | 31.8 | 6 | | TPER | | | | |
| Assessor Details | Mr. Darrer | n Coham | | | | | | | | | Assesso | r ID | R789-0 | 1001 | |
| Client | | | | | | | | | | | | | | | |
| SUMMARY FOR INP | JT DATA FO | R: New | Build (A | \s Desig | ned) | | | | | | | | | | |
| Orientation | | | | Southeas | t | | | | | | | | | | |
| Property Tenture | | | | ND | | | | | | | | | | | |
| Transaction Type | | | | 6 | | | | | | | | | | | |
| Terrain Type | rain Type | | | Urban | | | | | | | | | | | |
| 1.0 Property Type | | | | Flat, Mid- | Terrace | | | | | | | | | | |
| Position of Flat | | | | Mid-floor | | | | | | | | | | | |
| Which Floor | | | | 2 | | | | | | | | | | | |
| 2.0 Number of Storeys | | | | 1 | | | | | | | | | | | |
| _ | 0 Date Built | | 2023 | | | | | | | | | | | | |
| 4.0 Sheltered Sides | | | | | | | | | | | | | | | |
| 5.0 Sunlight/Shade | | | | Average or unknown | | | | | | | | | | | |
| 6.0 Thermal Mass Param | ntor | | | | | | | | | | | | | | |
| Thermal Mass | etei | | | Precise calculation N/A | | | | | | | kJ/m²K | | | | |
| Thermal wass | | | | IV/A | | | | | | | KO/III IX | | | | |
| 7.0 Electricity Tariff | | | | Standard | | | | | | | | | | | |
| Smart electricity meter | fitted | | | Yes | | | | | | | | | | | |
| Smart gas meter fitted | | | | Yes | | | | | | | | | | | |
| 7.0 Measurements | | | | G | Basement fround floor 1st Storey 2nd Storey 3rd Storey 4th Storey 5th Storey 6th Storey 7th Storey | : : : : | 0.00 m 18.71 n 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m | n | · Ir | 0.00 68.2 0.00 0.00 0.00 0.00 0.00 0.00 | 1 m²) m²) m²) m²) m²) m² | Aver | 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00 | m m m m m m m | |
| | | | | | 7 til Otolog | | | | | | | | | | |
| 8.0 Living Area | | | | 29.20 | 7 till Otolog | | | | | | m² | | | | |
| 9.0 External Walls Description | Туре | Constru | | | | (W/m ² K) | Kappa (kJ/m²K) | Area(m²) | Nett Area (m²) | Res | Shelter | | - | Type | |
| 9.0 External Walls | Type Cavity Wall Cavity Wall | Cavity w filled cav Cavity w | all : plasterbo | pard on dabs, de structure pard on dabs, | AAC block, | | | | | | | 16 cess 2. | 6.92 Calc | Type ulate Wall Ar | |
| 9.0 External Walls Description External Wall 1 Sheltered Wall | Cavity Wall | Cavity w filled cav Cavity w | rall : plasterbo rity, any outsi rall : plasterbo | pard on dabs, de structure pard on dabs, de structure | AAC block, | (W/m²K) 0.18 | (kJ/m²K) A 60.00 | Area(m²) 45.79 | (m²) 28.87 2.63 U-Value | Res 0.00 0.90 | Shelter None Stairwell Acc Corridor | 16 cess 2. 4 | 5.92 Cald | Type ulate Wall Ar | |
| 9.0 External Walls Description External Wall 1 Sheltered Wall | Cavity Wall Cavity Wall | Cavity w filled cav Cavity w filled cav | all : plasterbo | pard on dabs, de structure pard on dabs, de structure | AAC block, AAC block, | (W/m²K) 0.18 0.18 | (kJ/m²K) / 60.00 60.00 | Area(m²) 45.79 4.73 | (m²) 28.87 2.63 U-Value (W/m²K | Res 0.00 0.90 | Shelter None Stairwell Acc Corridor | 16 cess 2. | 6.92 Calc .10 Ent | ulate Wall Ar er Gross Are | |
| 9.0 External Walls Description External Wall 1 Sheltered Wall 9.1 Party Walls Description | Cavity Wall Cavity Wall Type Filled Cav | Cavity with alling | all : plasterbo | pard on dabs, de structure pard on dabs, de structure tion ard on dab C blocks, c | AAC block, AAC block, | (W/m²K) 0.18 0.18 | (kJ/m²K) / 60.00 60.00 | Area(m²) 45.79 4.73 | (m²) 28.87 2.63 U-Value (W/m²K | Res 0.00 0.90 • Kappa) (kJ/m²l | Shelter None Stairwell Acc Corridor | Shelte Res 0.00 | 6.92 Calc .10 Ent | Type ulate Wall Ar er Gross Are | |



| Description | | Consti | | | and the second | | | | | Kappa (kJ/m²K) | Area (m²) |
|---|------------------------------|----------------------|-------|--|------------------|----------------|--------------------------|--------------------|-------------------|-------------------|-------------------|
| Party Ceiling 1 | | Precas | t con | crete plank floor (screed l | aid on insulati | ion), carpet | ted | | | 30.00 | 68.21 |
| 11.1 Party Floors | | Ctorou | Con | otw.otion | | | | | | Vanna | Araa (mi |
| Description | | Storey Index | | struction | | | | | | Kappa (kJ/m²K) | , |
| Party Floor 1 | | Lowest occupied | Pred | ast concrete plank floor (| screed laid on | insulation |), carpeted | İ | | 30.00 | 68.21 |
| 12.0 Opening Types Description | Data Source | Туре | | Glazing | | Glazing | Filling | G-value | Frame | Frame | U Value |
| • | | | | Glazing | | Gap | Type | | Type | Factor | (W/m²K |
| Entrance Doors Windows | Manufacturer Manufacturer | Solid Door Window | r | Double Low-E Soft | 0.05 | | Air Filled Air Filled | | Wood Wood | 0.70 0.75 | 1.00 1.20 |
| 3.0 Openings | | | | | | | | | | | |
| Name pd1 | Opening Type Windows | ре | | Location External Wall 1 | | Orient | | Area | (m²) 40 | Pi | i tch 0 |
| w1 | Windows | | | External Wall 1 | | North \ | | 6.4 | | | 0 |
| w2 ed1 | Windows Entrance Do | ors | | External Wall 1 Sheltered Wall | | North South | | 5.0 | 04 10 | | 0 |
| 14.0 Conservatory | Entrance Be | | | None | | | Luot | <u>-</u> - | | | |
| 15.0 Draught Proofing | | | | 100 | | | | <u> </u> | | | |
| 16.0 Draught Lobby | | | | No | | | | = | | | |
| | | | | | | | | | | | |
| I7.0 Thermal Bridging I7.1 List of Bridges | | | | Calculate Bridges | | | | | | | |
| Bridge Type | | | | гсе Туре | Length | Psi | Adjusted | l Reference | ə: | | Importe |
| E1 Steel lintel with perfor E4 Jamb | rated steel base p | late | | pendently assessed pendently assessed | 8.07 18.50 | 0.07 0.02 | 0.07 0.02 | Thermally Knauf | Broken | | Yes Yes |
| E7 Party floor between d | | s of flats) | Inde | pendently assessed | 37.42 | 0.07 | 0.07 | Knauf | | | No |
| E18 Party wall between on E8 Balcony within a dwel | | n | | pendently assessed e K1 - Default | 10.80 4.50 | 0.07 0.10 | 0.07 0.10 | Knauf | | | Yes No |
| continuous P3 Party wall - Intermedia | | | | e K1 - Default | 32.90 | 0.00 | 0.00 | | | | No |
| (in blocks of flats) E17 Corner (inverted – ir | | | | pendently assessed | 2.70 | -0.09 | -0.09 | Knauf | | | No |
| external area) E16 Corner (normal) | nomar aroa groat | or triair | | pendently assessed | 2.70 | 0.05 | 0.05 | Knauf | | | No |
| Y-value | | | | 0.09 | | 0.00 | 0.00 | W/m²K | , | | |
| Description | | | | Arch | | | | vv/iii is | | | |
| · | | | | | | | | | | | |
| 18.0 Pressure Testing | | | | Yes | | | | _ | | | |
| Designed AP ₅₀ | | | | 3.00 | | | | m³/(h.r | n²) @ 50 P | a | |
| Property Tested? | | | | Yes | | | | \exists | | | |
| Test Method | | | | Blower Door | | | | _ | | | |
| As Built AP ₅₀ | | | | 0.10 | | | | m³/(h.r | n²) @ 50 P | a | |
| 19.0 Mechanical Ventilation Mechanical Ventilation | 1 | | | | | | | | | | |
| Mechanical Ventila | tion System Prese | ent | | Yes | | | | | | | |
| Approved Installation | • | | | No | | | | \exists | | | |
| Mechanical Ventila | | | | Database | | | | \dashv | | | |
| Туре | • | | | Balanced mechanical ve | ntilation with h | neat recove | ery | | | | |
| MV Reference Nun | nber | | | 500082 | | | | $\bar{\Box}$ | | | |
| Configuration | | | | 1 | | | | | | | |
| Manufacturer SFP | | | | 0.73 | | | | | | | |
| Duct Type | | | | Rigid | | | | | | | |
| MVHR Efficiency | | | | 90.00 | | | | | | | |
| Wet Rooms | | | | 1 | | | | $\bar{\Box}$ | | | |
| SFP from Installer | Commissioning C | ertificate | | No | | | | $\bar{\Box}$ | | | |
| | - | | | | | | | = | | | |
| MVHR System Loc | ation | | | Inside heated envelope (| installed exclu | ısıvely) | | | | | |



| 21.0 Fixed Cooling System | No | | | | |
|--|--------------------|-------------------|---------------------|----------------------|--------------------|
| 22.0 Lighting | | | | | |
| No Fixed Lighting | No | | | | |
| | Name Lighting 1 | Efficacy 80.00 | Power 6 | Capacity 480 | Count 10 |
| 24.0 Main Heating 1 | SAP table | | | | |
| Percentage of Heat | 100.00 | | | % | |
| Database Ref. No. | 0 | | | | |
| Fuel Type | Electricity | | | | |
| SAP Code | 224 | | | | |
| In Winter | 170.00 | | | | |
| In Summer | 170.00 | | | | |
| Controls SAP Code | 2207 | | | | |
| Delayed Start Stat | No | | | | |
| HETAS approved System | No | | | Ī | |
| Oil Pump Inside | No | | | i | |
| Fan Assisted Flue | No | | | Ħ | |
| Is MHS Pumped | Pump in heated | space | | \exists | |
| Heating Pump Age | 2013 or later | | | | |
| Heat Emitter | Underfloor | | | | |
| Underfloor Heating | Yes - Pipes in th | nin screed | | | |
| Flow Temperature | Enter value | iii sorecu | | = | |
| Flow Temperature Value | 45.00 | | | | |
| Boiler Interlock | No | | | | |
| - Bollet Interlock | INO | | | | |
| 25.0 Main Heating 2 | None | | | | |
| 26.0 Heat Networks | None | | | | |
| Heat Source Fuel Type Heating L | Jse Efficiency | Percentage Of He | eat Heat E Power | lectrical Fuel Facto | or Efficiency type |
| Hard comes de Nome | | Heat | Ratio | | |
| Heat source 1 None Heat source 2 None | | | | | |
| Heat source 3 None Heat source 4 None | | | | | |
| Heat source 5 None | | | | | |
| 28.0 Water Heating | | | | \neg | |
| Water Heating | Main Heating 1 | | | _ | |
| SAP Code | 901 | | | _ | |
| Flue Gas Heat Recovery System | No | | | | |
| Waste Water Heat Recovery Instantaneous System 1 | No | | | | |
| Waste Water Heat Recovery Instantaneous System 2 | No | | | | |
| Waste Water Heat Recovery Storage System | No | | | | |
| Solar Panel | No | | | | |
| Water use <= 125 litres/person/day | Yes | | | | |
| Summer Immersion | No | | | | |
| Cold Water Source | From mains | | | | |
| Bath Count | 1 | | | | |
| Supplementary Immersion | No | | | | |
| Immersion Only Heating Hot Water | No | | | | |
| 28.3 Waste Water Heat Recovery System | | | | | |
| 29.0 Hot Water Cylinder | Hot Water Cylin | der | | | |
| Cylinder Stat | Yes | <u>uoi</u> | | \exists | |
| Cylinaer Stat | 100 | | | _ | |



| Jan | Feb | Mar | Apr | May Jun | Jul | Aug | Sep | Oct | t Nov | Dec |
|--------------------|----------------|---------------|-----------|----------------------|-----------------------------|-----------------|---------------|---------------|---------------------------------|-----------------------|
| Electricity Gene | eration | | | Annual | | | | | | |
| Connected to d | welling's elec | tricity meter | | Yes | | | | | | |
| Apportioned | | | | 0.00 | | | | kWh/Ye | ear | |
| Electricity Gene | erated | | | 0.00 | | | | | | |
| 34.0 Small-scale H | lydro | | | None | | | | | | |
| 0.80 | | South | 30° | None Or Little | No | No | 1.00 | | 1101010100 | |
| PV Cells | kWp | Orientation | Elevation | Overshading | FGHRS | MCS Certificate | Over Facto | shading or | MCS Certificate Reference | Panel Manufacturer |
| Battery Capacit | y [kWh] | | | 0.00 | | | | | | |
| Diverter | | | | No | | | | | | |
| Connected To D | Owelling | | | Yes | | | | | | |
| Export Capable | Meter? | | | Yes | | | | | | |
| 32.0 Photovoltaic | Unit | | | Multiple Dwellings | Connected | | | | | |
| 31.0 Thermal Store | e | | | None | | | | | | |
| In Airing Cupbo | ard | | | No | | | | | | |
| Pipes insulation | ı | | | Fully insulated prin | nary pipework | | | | | |
| Loss | | | | 1.70 | | | | kWh/da | у | |
| Cylinder Volume | е | | | 150.00 | | | | L | | |
| Insulation Type | | | | Measured Loss | | | | | | |
| Independent Tir | me Control | | | Yes | | | | | | |
| Cylinder In Hea | ted Space | | | Yes | | | | | | |

Recommendations
Lower cost measures
None
Further measures to achieve even higher standards
None

Predicted Energy Assessment



Flat 3, Luton, Bedfordshire, LU1 3HX

Dwelling type:
Date of assessment:
Produced by:
Total floor area:
DRRN:

Flat, Mid-Terrace 05/07/2023 Darren Coham 68.21 m²

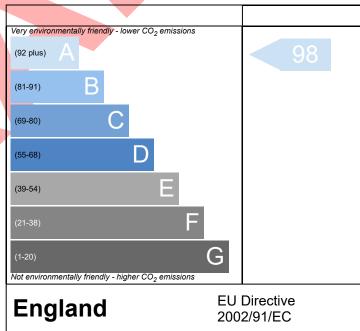
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Very energy efficient - lower running costs (92 plus) A (81-91) B (69-80) C (55-68) (1-20) F Not energy efficient - higher running costs England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

Thermal Bridging



| Property Reference | Flat 3 | | | | Issued on Date | 05/07/2023 |
|------------------------------------|--------------------------|--------------------------------------|-------------|-------------|------------------|------------|
| Assessment Reference | 00003 | | Pr | op Type Ref | Mid-Terrace Flat | |
| Property | Flat 3, Luton, Bedfordsh | Flat 3, Luton, Bedfordshire, LU1 3HX | | | | |
| SAP Rating | | 89 B | DER | 2.73 | TER | 13.18 |
| Environmental | | 98 A | % DER < TER | ₹ | | 79.29 |
| CO ₂ Emissions (t/year) | | 0.17 | DFEE | 29.52 | TFEE | 30.20 |
| Compliance Check | | See BREL | % DFEE < TF | EE | | 2.26 |
| % DPER < TPER | | 55.19 | DPER | 31.86 | TPER | 71.09 |
| Assessor Details | Mr. Darren Coham | | | | Assessor ID | R789-0001 |
| Client | | | | | | |

| | Junction details | Source Type | Psi (W/mK) | Length (m) | Result | Reference |
|------------------|---|------------------------|---------------|---------------|--------|---------------------|
| External wall | E1 Steel lintel with perforated steel base plate | Independently assessed | 0.068 | 8.07 | 0.55 | Thermally Broken |
| External wall | E4 Jamb | Independently assessed | 0.018 | 18.50 | 0.33 | Knauf |
| External wall | E7 Party floor between dwellings (in blocks of flats) | Independently assessed | 0.065 | 37.42 | 2.43 | Knauf |
| External wall | E18 Party wall between dwellings | Independently assessed | 0.069 | 10.80 | 0.75 | Knauf |
| External wall | E8 Balcony within a dwelling, wall insulation continuous | Table K1 - Default | 0.100 | 4.50 | 0.45 | |
| Party wall | P3 Party wall - Intermediate floor between dwellings (in blocks of flats) | Table K1 - Default | 0.000 | 32.90 | 0.00 | |
| External wall | E17 Corner (inverted – internal area greater than external area) | Independently assessed | -0.090 | 2.70 | -0.24 | Knauf |
| External wall | E16 Corner (normal) | Independently assessed | 0.048 | 2.70 | 0.13 | Knauf |

Total: 117.59 W/mK:
Y-Value: 0.09 W/m²K:

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 05 Jul 2023 11:45:14

| Project Information | | | |
|----------------------------|--------------|-----------------|-------------------|
| Assessed By | Darren Coham | Building Type | Flat, End-terrace |
| OCDEA Registration | EES/022007 | Assessment Date | 2023-07-05 |

| Dwelling Details | | | | |
|-------------------------|-----------------------|------------------|-------------------|--|
| Assessment Type | As designed | Total Floor Area | 55 m ² | |
| Site Reference | Flat 4 | Plot Reference | 00004 | |
| Address | Flat 4, Luton, LU1 3H | HX | • | |

| Client Details | |
|----------------|------------|
| Name | • |
| Company | - |
| Address | -, -, -, - |

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 | 15.12 kgCO ₂ /m ² | |
| Dwelling carbon dioxide emission rate | 2.77 kgCO ₂ /m ² | OK |
| 1b Target primary energy rate and dwelling prin | nary energy | |
| Target primary energy | 81.86 kWh _{PE} /m ² | |
| Dwelling primary energy | 33.25 kWh _{PE} /m ² | OK |
| 1c Target fabric energy efficiency and dwelling | fabric energy efficiency | |
| Target fabric energy efficiency | 33.5 kWh/m ² | |
| Dwelling fabric energy efficiency | 30.5 kWh/m ² | OK |

| 2a Fabric U-values | | | | | | |
|--------------------|---|---|---|-----|--|--|
| Element | Maximum permitted average U-Value [W/m²K] | 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 | 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, | 1.6 | 1.16 | pd1 (1.2) | OK | | |
| and roof windows | | | | | | |
| 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) | 35.78 | 0.18 | | | |
| Sheltered wall: Walls (2) | 19.2349 | 0.18 | | | |
| Party wall: Party Wall (1) | 23.08 | 0 (!) | | | |

| 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] | |
| pd1, Windows | 5.4 | North East | 0.75 | 1.2 | |
| w1, Windows | 3.24 | North East | 0.75 | 1.2 | |
| ed1, Entrance Doors | 2.0951 | North West | N/A | 1 (!) | |

| 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 | E1: Steel lintel with perforated steel base plate | Calculated by person with suitable expertise | 0.068 | Thermally Broken | | | |
| External wall | E4: Jamb | Calculated by person with suitable expertise | 0.018 (!) | Knauf | | | |
| External wall | E7: Party floor between dwellings (in blocks of flats) | Calculated by person with suitable expertise | 0.065 | Knauf | | | |
| | | | | | | | |

Date generated: 2023-07-05 11:45:14

| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
|---------------|---|--|---------------------|---------------------|
| External wall | E16: Corner (normal) | Calculated by person with suitable expertise | 0.048 | Knauf |
| External wall | E18: Party wall between dwellings | Calculated by person with suitable expertise | 0.069 | Knauf |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.09 | Knauf |
| Party wall | P3: Intermediate floor between dwellings (in blocks of flats) | SAP table default | 0 (!) | Default |
| External wall | E8: Balcony within a dwelling - wall insulation continuous | SAP table default | 0.1 | Default |

| 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 | 219.3% | | | | | | | | |
| Emitter type | Underfloor | | | | | | | | |
| Flow temperature | 45°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 | 150 litres | | | | | | | |
| Declared heat loss | 1.7 kWh/day | | | | | | | |
| Primary pipework insulated | Yes | | | | | | | |
| Manufacturer | | | | | | | | |
| Model | | | | | | | | |
| Commissioning | | | | | | | | |
| Waste water heat recovery system 1 | - type: N/A | | | | | | | |
| Efficiency | | | | | | | | |
| Manufacturer | | | | | | | | |
| Model | | | | | | | | |

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

| 7 Lighting | | | | | | | | |
|---|---------|----|--|--|--|--|--|--|
| Minimum permitted light source efficacy | 75 lm/W | | | | | | | |
| Lowest light source efficacy | 80 lm/W | OK | | | | | | |
| External lights control | N/A | | | | | | | |

| 8 Mechanical ventilation | | | | | | | | |
|---|-------------------------|---|----|--|--|--|--|--|
| System type: Balanced whole-house me | echanical ventilation v | with heat recovery | | | | | | |
| Maximum permitted specific fan power | 1.5 W/(l/s) | | | | | | | |
| Specific fan power | 0.73 W/(l/s) | | OK | | | | | |
| Minimum permitted heat recovery | 73% | | | | | | | |
| efficiency | | | | | | | | |
| Heat recovery efficiency | 90% | | OK | | | | | |
| Manufacturer/Model | HRV1 Q Plus | | | | | | | |
| Commissioning | | | | | | | | |
| 9 Local generation | | | | | | | | |
| Technology type: Photovoltaic system | (1) | | | | | | | |
| Peak power | 0.8 kWp | | | | | | | |
| Orientation | South | | | | | | | |
| Pitch | | | | | | | | |
| Overshading | None or very little | | | | | | | |
| Manufacturer | | | | | | | | |
| MCS certificate | | | | | | | | |
| | | | | | | | | |
| 10 Heat networks | | | | | | | | |
| N/A | | | | | | | | |
| 11 Supporting documentary evidence | | | | | | | | |
| N/A | | | | | | | | |
| 40 D | | | | | | | | |
| 12 Declarations | | | | | | | | |
| a. Assessor Declaration | | stanta of this DDEL Compliance Depart | | | | | | |
| | | Intents of this BREL Compliance Report of the submitted for this dwelling for | | | | | | |
| | | <u> </u> | | | | | | |
| the purpose of carrying out the "As de evidence (SAP Conventions, Appendi | | | | | | | | |
| documentary evidence required) has | | | | | | | | |
| Compliance Report. | been reviewed in the | course of preparing this BNEL | | | | | | |
| Compliance Report. | | | | | | | | |
| | | | | | | | | |
| Signed: | | Assessor ID: | | | | | | |
| Oigneu. | | A3363301 ID. | | | | | | |
| | | | | | | | | |
| Name: | | Date: | | | | | | |
| radiio. | | Daic. | | | | | | |

b. Client Declaration

N/A



| Dronouty Defende | E | 4 | | | | | | | | laar | ad an Dat | | VE 107 1000 | 20 |
|------------------------------------|-------------------------|---------------------|-----------------|---|--|--------------|---|---------------------------------|----------------------|--|---|-----------------|--|--|
| Property Reference | Flat | | | | | | Duou | Tunal | Def | | ed on Date | 9 [(| 05/07/202 | 23 |
| Assessment Reference | | | | | | | Prop | Type I | Ref | Flat | | | | |
| Property | Flat | 4, Luton, | Beafordshi | re, LU1 3HX | | | | | | | | | | |
| SAP Rating | | | | 89 B | | DER | | 2.77 | , | | TER | | 15.12 | |
| Environmental | | | | 98 A | | % DER | < TER | | | | | | 81.68 | |
| CO ₂ Emissions (t/year) | | | | 0.14 | | DFEE | | 30.5 | 50 | | TFEE | | 33.51 | |
| Compliance Check | | | | See BREL | | % DFE | E < TFEE | E | | | | | 8.99 | |
| % DPER < TPER | | | | 59.38 | | DPER | | 33.2 | 25 | | TPER | | 81.86 | |
| Assessor Details | Mr. Darre | n Coham | 1 | | | | | | | | Assesso | r ID | R789-0 | 0001 |
| Client | | | | | | | | | | | | | 1.1.00 | |
| SUMMARY FOR INPU | JT DATA FO | DR: Nev | v Build (/ | As Designed) | | | | | | | | | | |
| | <i>7</i> 1 <i>5</i> 7 | | r Dana (r | | | | | | | | | | | |
| Orientation | | | | Northwest | | | | | | == | | | | |
| Property Tenture | | | | ND | | | | | | = | | | | |
| Transaction Type | | | | 6 | | | | | | | | | | |
| Terrain Type | | | | Urban | | | | | | | | | | |
| 1.0 Property Type | | | | Flat, End-Terra | ce | | | | | | | | | |
| Position of Flat | | | | Mid-floor flat | | | | | | | | | | |
| Which Floor | | | | 2 | | | | | | | | | | |
| 2.0 Number of Storeys | | | | 1 | | | | | | | | | | |
| 3.0 Date Built | | | | 2023 | | | | | | | | | | |
| 4.0 Sheltered Sides | | | | 2 | | | | | | | | | | |
| 5.0 Sunlight/Shade | | | | Average or unk | | | | | | | | | | |
| 6.0 Thermal Mass Parame | eter | | | Precise calcula | ition | | | | | | | | | |
| Thermal Mass | | | | N/A | | | | | | | kJ/m²K | | | |
| 7.0 Electricity Tariff | | | | Standard | | | | | | | | | | |
| Smart electricity meter f | fitted | | | Yes | | | | | | | | | | |
| Smart gas meter fitted | | | | Yes | | | | | | | | | | |
| 7.0 Measurements | | | | | | | | | | | | | | |
| | | | | Groun 1st 2nd 3rd 4th 5th 6th | ement d floor Storey Storey Storey Storey Storey Storey Storey | | 0.00 m 24.35 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m | n m n n n n n | r In | 0.00 55.2 0.00 0.00 0.00 0.00 0.00 | iloor Area) m² 3 m²) m²) m²) m²) m²) m²) m²) m²) | Ave | 0.00 0.00 2.70 0.00 0.00 0.00 0.00 0.00 | 0 m 0 m 0 m 0 m 0 m 0 m |
| 8.0 Living Area | | | | 26.61 | | | | | | | m² | | | |
| 9.0 External Walls | _ | _ | | | | | | _ | | | | | | |
| Description | Type | Covity | | oord on Jaka AAC | loo! | | (kJ/m²K) | Area(m²) | | Res | Shelter | • | _ | ea Calculation Type |
| External Wall 1 Sheltered Wall | Cavity Wall Cavity Wall | filled ca Cavity | avity, any outs | oard on dabs, AAC b | | 0.18 0.18 | 60.00 | 44.42 21.33 | 35.78 19.23 | 0.00 | None Stairwell Ac Corridor | cess 2 | | culate Wall Are ter Gross Area |
| 9.1 Party Walls | | illieu ca | arny, any outs | iao siruoluit | | | | | | | Comuci | 7 | | |
| Description | Туре | | Construc | ction | | | | | U-Value | Карр | a Area | Shelte | er (| Shelter |
| Party Wall 1 | | avity with | | ard on dabs mou C blocks, cavity | ınted oı | n cemen | t render | on both | (W/m ² K) | | K) (m²) | Res 0.00 | | None |
| | Edge Se | aiiig | 31463,717 | O DIOCKS, Cavity | | | | | | | | | | |
| 9.2 Internal Walls Description | Edge Se | | Construct | | | | | | | | | | Kappa | Area (m² |
| | Edge Se | | Construct | | ne | | | | | | | ı | Kappa (kJ/m²K) 9.00 | Area (m² |



| Description | | Constr | | | laid an in adak | · | t. d | | | Kappa (kJ/m²K) | Area (m²) |
|---|------------------------------|----------------------|---------|--|-------------------|-----------------|--------------------------|----------------|----------------------|-------------------|-------------------|
| Party Ceiling 1 | | Precas | t concr | ete plank floor (screed | iaid on insulat | ion), carpe | ted | | | 30.00 | 55.23 |
| 11.1 Party Floors Description | | Storey | Conet | ruction | | | | | | Kappa | Area (m²) |
| • | | Index | | | , | | | | | (kJ/m²K) | , , |
| Party Floor 1 | | Lowest occupied | Preca | st concrete plank floor | (screed laid or | ninsulation |), carpeted | | | 30.00 | 55.23 |
| 12.0 Opening Types | Data Source | Tuno | | Glazina | | Glazina | Eilling | G value | Frama | Frame | U Value |
| Description | | Туре | | Glazing | | Glazing Gap | Filling Type | G-value | Type | Factor | (W/m^2K) |
| Entrance Doors Windows | Manufacturer Manufacturer | Solid Door Window | r | Double Low-E So | ft 0.05 | | Air Filled Air Filled | 0.00 0.63 | Wood Wood | 0.70 0.75 | 1.00 1.20 |
| 13.0 Openings | | | _ | | | | | | | _ | |
| Name pd1 | Opening Type Windows | pe | | ocation xternal Wall 1 | | Orient North | | | a (m²) .40 | | i tch 0 |
| w1 ed1 | Windows Entrance Do | ors | | xternal Wall 1 heltered Wall | | North North | | | .24 .10 | | 0 |
| | Emilarios Bo | | | | | TTOTAL | | <u>_</u> | | | |
| 14.0 Conservatory | | | | one | | | | | | | |
| 15.0 Draught Proofing | | | | 00 | | | | % | | | |
| 16.0 Draught Lobby | | | N | 0 | | | | | | | |
| 17.0 Thermal Bridging | | | C | alculate Bridges | | | | | | | |
| 17.1 List of Bridges Bridge Type | | | Sourc | е Туре | Length | Psi | Adjusted | Referenc | ٠۵٠ | | Imported |
| E1 Steel lintel with perfora | ted steel base p | late | Indep | endently assessed | 4.62 | 0.07 | 0.07 | Thermally | | | Yes |
| E4 Jamb E7 Party floor between dw | ellings (in blocks | s of flats) | | endently assessed endently assessed | 13.70 48.70 | 0.02 0.07 | | Knauf Knauf | | | Yes No |
| E16 Corner (normal) | - , | , | Indep | endently assessed | 10.80 | 0.05 | | Knauf | | | No |
| E18 Party wall between dv E17 Corner (inverted – inte | | er than | | endently assessed endently assessed | 5.40 2.70 | 0.07 -0.09 | | Knauf Knauf | | | Yes No |
| external area) P3 Party wall - Intermediat (in blocks of flats) | e floor between | dwellings | Table | K1 - Default | 17.10 | 0.00 | 0.00 | Default | | | No |
| E8 Balcony within a dwellin continuous | ng, wall insulatio | n | Table | K1 - Default | 3.00 | 0.10 | 0.10 | Default | | | No |
| Y-value | | | 0 | 07 | | | | W/m²l | K | | |
| Description | | | A | rch | | | | | | | |
| 18.0 Pressure Testing | | | Υ | es | | | | | | | |
| Designed AP ₅₀ | | | 3 | .00 | | | | m³/(h. | m²) @ 50 P | а | |
| Property Tested? | | | Y | es | | | | | | | |
| Test Method | | | В | lower Door | | | | | | | |
| As Built AP ₅₀ | | | 0 | 10 | | | | m³/(h. | m²) @ 50 P | a | |
| 19.0 Mechanical Ventilation | | | | | | | | | | | |
| Mechanical Ventilation | 0 1 5 | | Į. | | | | | _ | | | |
| Mechanical Ventilation | - | ent | | es | | | | _ | | | |
| Approved Installation | | | | 0 | | | | ╣ | | | |
| Mechanical Ventilation | on data Type | | | atabase | | | | \exists | | | |
| Туре | | | | alanced mechanical ve | entilation with h | neat recove | ery | _ | | | |
| MV Reference Numb | per | | 5 | 00082 | | | | _ | | | |
| Configuration | | | 1 | | | | | ╛ | | | |
| Manufacturer SFP | | | 0 | 73 | | | | ╛ | | | |
| Duct Type | | | R | igid | | | | | | | |
| MVHR Efficiency | | | 9 | 0.00 | | | | | | | |
| Wet Rooms | | | 1 | | | | | | | | |
| SFP from Installer Co | ommissioning C | ertificate | N | 0 | | | | | | | |
| MVHR System Locat | tion | | lr | side heated envelope | (installed exclu | usively) | | | | | |
| Duct Installation Spe | | | | evel 1 | | | | Ŧ | | | |
| 20.0 Fans, Open Fireplaces, | | | | | | | | | | | |



| 21.0 Fixed Cooling System | No | | | | |
|--|--------------------|-------------------|---------------------|----------------------|--------------------|
| 22.0 Lighting | | | | | |
| No Fixed Lighting | No | | | | |
| | Name Lighting 1 | Efficacy 80.00 | Power 6 | Capacity 480 | Count 10 |
| 24.0 Main Heating 1 | SAP table | | | | |
| Percentage of Heat | 100.00 | | | % | |
| Database Ref. No. | 0 | | | | |
| Fuel Type | Electricity | | | | |
| SAP Code | 224 | | | | |
| In Winter | 170.00 | | | | |
| In Summer | 170.00 | | | | |
| Controls SAP Code | 2207 | | | | |
| Delayed Start Stat | No | | | | |
| HETAS approved System | No | | | Ī | |
| Oil Pump Inside | No | | | i | |
| Fan Assisted Flue | No | | | Ħ | |
| Is MHS Pumped | Pump in heated | space | | \exists | |
| Heating Pump Age | 2013 or later | | | | |
| Heat Emitter | Underfloor | | | | |
| Underfloor Heating | Yes - Pipes in th | nin screed | | | |
| Flow Temperature | Enter value | iii sorecu | | = | |
| Flow Temperature Value | 45.00 | | | | |
| Boiler Interlock | No | | | | |
| - Bollet Interlock | INO | | | | |
| 25.0 Main Heating 2 | None | | | | |
| 26.0 Heat Networks | None | | | | |
| Heat Source Fuel Type Heating L | Jse Efficiency | Percentage Of He | eat Heat E Power | lectrical Fuel Facto | or Efficiency type |
| Hard comes de Nome | | Heat | Ratio | | |
| Heat source 1 None Heat source 2 None | | | | | |
| Heat source 3 None Heat source 4 None | | | | | |
| Heat source 5 None | | | | | |
| 28.0 Water Heating | | | | \neg | |
| Water Heating | Main Heating 1 | | | _ | |
| SAP Code | 901 | | | _ | |
| Flue Gas Heat Recovery System | No | | | | |
| Waste Water Heat Recovery Instantaneous System 1 | No | | | | |
| Waste Water Heat Recovery Instantaneous System 2 | No | | | | |
| Waste Water Heat Recovery Storage System | No | | | | |
| Solar Panel | No | | | | |
| Water use <= 125 litres/person/day | Yes | | | | |
| Summer Immersion | No | | | | |
| Cold Water Source | From mains | | | | |
| Bath Count | 1 | | | | |
| Supplementary Immersion | No | | | | |
| Immersion Only Heating Hot Water | No | | | | |
| 28.3 Waste Water Heat Recovery System | | | | | |
| 29.0 Hot Water Cylinder | Hot Water Cylin | der | | | |
| Cylinder Stat | Yes | <u>uoi</u> | | \exists | |
| Cylinaer Stat | 100 | | | _ | |



| Jan | Feb | Mar | Apr | May Jun | Jul | Aug | Sep | Oct | t Nov | Dec |
|--------------------|----------------|---------------|-----------|----------------------|-----------------------------|-----------------|---------------|---------------|---------------------------------|-----------------------|
| Electricity Gene | eration | | | Annual | | | | | | |
| Connected to d | welling's elec | tricity meter | | Yes | | | | | | |
| Apportioned | | | | 0.00 | | | | kWh/Ye | ear | |
| Electricity Gene | erated | | | 0.00 | | | | | | |
| 34.0 Small-scale H | lydro | | | None | | | | | | |
| 0.80 | | South | 30° | None Or Little | No | No | 1.00 | | 1101010100 | |
| PV Cells | kWp | Orientation | Elevation | Overshading | FGHRS | MCS Certificate | Over Facto | shading or | MCS Certificate Reference | Panel Manufacturer |
| Battery Capacit | y [kWh] | | | 0.00 | | | | | | |
| Diverter | | | | No | | | | | | |
| Connected To D | Owelling | | | Yes | | | | | | |
| Export Capable | Meter? | | | Yes | | | | | | |
| 32.0 Photovoltaic | Unit | | | Multiple Dwellings | Connected | | | | | |
| 31.0 Thermal Store | e | | | None | | | | | | |
| In Airing Cupbo | ard | | | No | | | | | | |
| Pipes insulation | ı | | | Fully insulated prin | nary pipework | | | | | |
| Loss | | | | 1.70 | | | | kWh/da | у | |
| Cylinder Volume | е | | | 150.00 | | | | L | | |
| Insulation Type | | | | Measured Loss | | | | | | |
| Independent Tir | me Control | | | Yes | | | | | | |
| Cylinder In Hea | ted Space | | | Yes | | | | | | |

Recommendations
Lower cost measures
None
Further measures to achieve even higher standards
None

Predicted Energy Assessment



Flat 4, Luton, Bedfordshire, LU1 3HX

Dwelling type:
Date of assessment:
Produced by:
Total floor area:
DRRN:

Flat, End-Terrace 05/07/2023 Darren Coham 55.23 m²

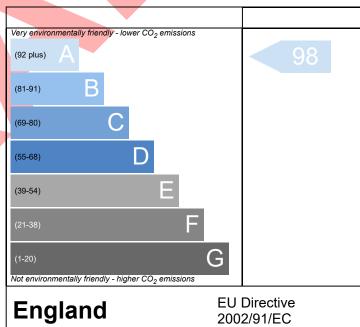
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Very energy efficient - lower running costs (92 plus) A (81-91) B (69-80) C (55-68) (1-20) F Not energy efficient - higher running costs England Eu Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

Thermal Bridging



| Property Reference | Flat 4 | | Issued on Date | 05/07/2023 | | | | | | | |
|------------------------------------|--------------------------|--------------------------------------|----------------|------------|------------------|-----------|--|--|--|--|--|
| Assessment Reference | 00004 | | Pro | p Type Ref | End-Terrace Flat | | | | | | |
| Property | Flat 4, Luton, Bedfordsh | Flat 4, Luton, Bedfordshire, LU1 3HX | | | | | | | | | |
| SAP Rating | | 89 B | DER | 2.77 | TER | 15.12 | | | | | |
| Environmental | 98 A | % DER < TER | 81.68 | | | | | | | | |
| CO ₂ Emissions (t/year) | | 0.14 | DFEE | 30.50 | TFEE | 33.51 | | | | | |
| Compliance Check | | See BREL | % DFEE < TFE | E | | 8.99 | | | | | |
| % DPER < TPER | | 59.38 | DPER | 33.25 | TPER | 81.86 | | | | | |
| Assessor Details | Mr. Darren Coham | | | | Assessor ID | R789-0001 | | | | | |
| Client | | | | | | | | | | | |

| | Junction details | Source Type | Psi (W/mK) | Length (m) | Result | Reference |
|------------------|---|------------------------|---------------|---------------|--------|---------------------|
| External wall | E1 Steel lintel with perforated steel base plate | Independently assessed | 0.068 | 4.62 | 0.31 | Thermally Broken |
| External wall | E4 Jamb | Independently assessed | 0.018 | 13.70 | 0.25 | Knauf |
| External wall | E7 Party floor between dwellings (in blocks of flats) | Independently assessed | 0.065 | 48.70 | 3.17 | Knauf |
| External wall | E16 Corner (normal) | Independently assessed | 0.048 | 10.80 | 0.52 | Knauf |
| External wall | E18 Party wall between dwellings | Independently assessed | 0.069 | 5.40 | 0.37 | Knauf |
| External wall | E17 Corner (inverted – internal area greater than external area) | Independently assessed | -0.090 | 2.70 | -0.24 | Knauf |
| Party wall | P3 Party wall - Intermediate floor between dwellings (in blocks of flats) | Table K1 - Default | 0.000 | 17.10 | 0.00 | Default |
| External wall | E8 Balcony within a dwelling, wall insulation continuous | Table K1 - Default | 0.100 | 3.00 | 0.30 | Default |

Total: 106.02 W/mK:
Y-Value: 0.07 W/m²K:

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 05 Jul 2023 11:45:14

| Project Information | | | | |
|---------------------|--------------|-----------------|-------------------|--|
| Assessed By | Darren Coham | Building Type | Flat, End-terrace | |
| OCDEA Registration | EES/022007 | Assessment Date | 2023-07-05 | |

| Dwelling Details | | | | |
|------------------|------------------------|------------------|-------------------|--|
| Assessment Type | As designed | Total Floor Area | 97 m ² | |
| Site Reference | Flat 5 | Plot Reference | 00005 | |
| Address | Flat 5, Luton, LU1 3H) | (| | |

| Client Details | | | | |
|----------------|------------|--|--|--|
| Name | • | | | |
| Company | - | | | |
| Address | -, -, -, - | | | |

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 | 12.57 kgCO ₂ /m ² | | | |
| Dwelling carbon dioxide emission rate | 2.86 kgCO ₂ /m ² | OK | | |
| 1b Target primary energy rate and dwelling primary energy | | | | |
| Target primary energy | 67.46 kWh _{PE} /m ² | | | |
| Dwelling primary energy | 31.89 kWh _{PE} /m ² | OK | | |
| 1c Target fabric energy efficiency and dwelling fabric energy efficiency | | | | |
| Target fabric energy efficiency | 35.4 kWh/m ² | | | |
| Dwelling fabric energy efficiency | 33.7 kWh/m ² | OK | | |

| 2a Fabric U-values | | | | | |
|----------------------------------|---|----------------------------------|---|-----|--|
| Element | Maximum permitted average U-Value [W/m²K] | Dwelling average U-Value [W/m²K] | 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 | 1.18 | pd1 (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) | 59.48 | 0.18 | | |
| Sheltered wall: Walls (2) | 26.6649 | 0.18 | | |
| Party wall: Party Wall (1) | 20.52 | 0 (!) | | |

| 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] |
| pd1, Windows | 5.4 | North West | 0.75 | 1.2 |
| pd1, Windows | 5.4 | North West | 0.75 | 1.2 |
| w1, Windows | 3.24 | North West | 0.75 | 1.2 |
| w2, Windows | 6.48 | North West | 0.75 | 1.2 |
| ed1, Entrance Doors | 2.0951 | South East | N/A | 1 (!) |
| w3, Windows | 5.04 | South East | 0.75 | 1.2 |

| 2d Thermal bridging (better than typically expected values are flagged with a subsequent (!)) | | | | | | |
|---|------------------------------------|--|--------------------|-----------|--|--|
| Building part 1 - | Main Dwelling: Thermal bridging ca | alculated from linear thermal transmit | tances for each ju | ınction | | |
| Main element Junction detail Source Psi value Drawing / | | | | | | |
| | | | [W/mK] | reference | | |
| External wall | E1: Steel lintel with perforated | Calculated by person with suitable | 0.068 | Thermally | | |
| | steel base plate | expertise | | Broken | | |
| External wall | E4: Jamb | Calculated by person with suitable | 0.018 (!) | Knauf | | |
| | | | | | | |

Date generated: 2023-07-05 11:45:14

| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
|---------------|-----------------------------------|------------------------------------|---------------------|---------------------|
| | | expertise | | |
| External wall | E7: Party floor between dwellings | Calculated by person with suitable | 0.065 | Knauf |
| | (in blocks of flats) | expertise | | |
| External wall | E16: Corner (normal) | Calculated by person with suitable | 0.048 | Knauf |
| | | expertise | | |
| External wall | E18: Party wall between dwellings | Calculated by person with suitable | 0.069 | Knauf |
| | | expertise | | |
| External wall | E8: Balcony within a dwelling - | SAP table default | 0.1 | |
| | wall insulation continuous | | | |
| Party wall | P3: Intermediate floor between | SAP table default | 0 (!) | |
| | dwellings (in blocks of flats) | | | |
| External wall | E17: Corner (inverted - internal | Calculated by person with suitable | -0.09 | Knauf |
| | area greater than external area) | expertise | | |

| 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 | 219.3% | | | | |
| Emitter type | Radiators | | | | |
| Flow temperature | 45°C | | | | |
| System type | Air source heat pump | | | | |
| Manufacturer | | | | | |
| Model | | | | | |
| Commissioning | | | | | |
| Secondary heating system: N/A | Secondary heating system: N/A | | | | |
| Fuel | N/A | | | | |
| Efficiency | N/A | | | | |
| Commissioning | | | | | |

| 5 Hot water | |
|--------------------------------------|-------------|
| Cylinder/store - type: Cylinder | |
| Capacity | 150 litres |
| Declared heat loss | 1.7 kWh/day |
| Primary pipework insulated | Yes |
| Manufacturer | |
| Model | |
| Commissioning | |
| Waste water heat recovery system 1 - | type: N/A |
| Efficiency | |
| Manufacturer | |
| Model | |

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

| 7 Lighting | | |
|---|---------|----|
| Minimum permitted light source efficacy | 75 lm/W | |
| Lowest light source efficacy | 80 lm/W | OK |
| External lights control | N/A | |

| 8 Mechanical ventilation | | | |
|---|-------------------------|---|----|
| System type: Balanced whole-house me | echanical ventilation v | with heat recovery | |
| Maximum permitted specific fan power | 1.5 W/(l/s) | | |
| Specific fan power | 0.73 W/(l/s) | | OK |
| Minimum permitted heat recovery | 73% | | |
| efficiency | | | |
| Heat recovery efficiency | 90% | | OK |
| Manufacturer/Model | HRV1 Q Plus | | |
| Commissioning | | | |
| 9 Local generation | | | |
| Technology type: Photovoltaic system | (1) | | |
| Peak power | 0.8 kWp | | |
| Orientation | South | | |
| Pitch | 30° | | |
| Overshading | None or very little | | |
| Manufacturer | Trong of vory little | | |
| MCS certificate | | | |
| | | | |
| 10 Heat networks | | | |
| N/A | | | |
| 11 Supporting documentary evidence | | | |
| N/A | | | |
| 40 D | | | |
| 12 Declarations | | | |
| a. Assessor Declaration | | stanta of this DDEL Compliance Depart | |
| | | Intents of this BREL Compliance Report of the submitted for this dwelling for | |
| | | <u> </u> | |
| the purpose of carrying out the "As de evidence (SAP Conventions, Appendi | | | |
| documentary evidence required) has | | | |
| Compliance Report. | been reviewed in the | course of preparing this BNEL | |
| Compliance Report. | | | |
| | | | |
| Signed: | | Assessor ID: | |
| Oigneu. | | A3363301 ID. | |
| | | | |
| Name: | | Date: | |
| radiio. | | Daic. | |

b. Client Declaration

N/A



| Property Reference | Flat | 5 | | | | | | | | Issu | ed on Da | te | 05/07/20 | 23 |
|---|---|--|---|--|--|-----------------------|---|----------------------------|----------------------|--|---|--------|--|--|
| Assessment Reference | 0000 | 05 | | | | | Prop | Type I | Ref | Flat | | | | |
| Property | Flat | 5, Luton, | Bedfordshi | re, LU1 3HX | | | | | | | | | | |
| SAP Rating | | | | 87 B | | DER | | 2.86 | | | TER | | 12.57 | , |
| Environmental | | | | 98 A | | % DER | < TER | | | | | | 77.25 | i |
| CO ₂ Emissions (t/year) | | | | 0.25 | | DFEE | | 33.6 | 7 | | TFEE | | 35.44 | |
| Compliance Check | | | | See BREL | | % DFE | E < TFEE | | | | | | 4.98 | |
| % DPER < TPER | | | | 52.73 | | DPER | | 31.8 | 9 | | TPER | | 67.46 | i |
| Assessor Details | Mr. Darre | en Coham | l | | | | | | | | Assess | or ID | R789 | -0001 |
| Client | | | | | | | | | | | | | | |
| SUMMARY FOR INP | JT DATA FO | OR: Nev | v Build (A | As Designe | d) | | | | | | | | | |
| Orientation | | | | Southeast | | | | | | | | | | |
| Property Tenture | | | | ND | | | | | | \equiv | | | | |
| Transaction Type | | | | 6 | | | | | | | | | | |
| Terrain Type | | | | Urban | | | | | | | | | | |
| 1.0 Property Type | | | | Flat, End-Ter | race | | | | | | | | | |
| Position of Flat | | | | Mid-floor flat | | | | | | | | | | |
| Which Floor | | | | 3 | | | | | | | | | | |
| 2.0 Number of Storeys | | | | 1 | | | | | | | | | | |
| 3.0 Date Built | | | | 2023 | | | | | | | | | | |
| 4.0 Sheltered Sides | | | | 2 | | | | | | | | | | |
| 5.0 Sunlight/Shade | | | | Average or u | ınknown | | | | | | | | | |
| 6.0 Thermal Mass Param | otor | | | Precise calcu | | | | | | | | | | |
| Thermal Mass | etei | | | N/A | ulation | | | | | | kJ/m²K | | | |
| | | | | | | | | | | | | | | |
| 7.0 Electricity Tariff | | | | Standard | | | | | | | | | | |
| Smart electricity meter | fitted | | | Yes | | | | | | | | | | |
| Smart gas meter fitted | | | | Yes | | | | | | | | | | |
| 7.0 Measurements | | | | Grou 1s 2n 3r 4t 5t 6t 7t | asement und floor st Storey d Storey th Storey th Storey th Storey | : : : : : | 0.00 m 42.15 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m | n m i i i i | r In | 0.00 97.2 0.00 0.00 0.00 0.00 0.00 | Floor Area) m² 0 m²) m²) m²) m²) m²) m²) m²) m²) | a A | 0.0 2.7 0.0 0.0 0.0 0.0 0.0 0.0 | orey Heigh 0 m 0 m 0 m 0 m 0 m 0 m 0 m 0 m 0 m 0 m |
| 8.0 Living Area | | | | 37.01 | | | | | | | m² | | | |
| | | Constr | | and an debe AAC | 2 blasts | | (kJ/m²K) | Area(m²) | Nett Area (m²) | Res | Shelt | | | rea Calculatio |
| Description | Type | 0 | | oard on dabs, AA0 | DIOCK, | 0.18 0.18 | 60.00 | 85.05 28.76 | 59.49 26.66 | 0.00 | None Stairwell A Corrido | Access | | alculate Wall Ar inter Gross Are |
| | Type Cavity Wall Cavity Wall | filled ca Cavity | vity, any outs | oard on dabs, AA0 | C block, | | | | | | | | | |
| Description External Wall 1 Sheltered Wall | Cavity Wall | filled ca Cavity | vity, any outs wall : plasterb | oard on dabs, AA0 ide structure | C block, | | | | U-Value | | | | elter | Shelter |
| Description External Wall 1 Sheltered Wall 9.1 Party Walls | Cavity Wall Cavity Wall Type | filled ca Cavity filled ca | vity, any outs wall: plasterb avity, any outs Construct Plasterbo | oard on dabs, AA0 ide structure | ounted o | n cemen | t render (| on both | (W/m ² K) | | K) (m²) | Re | elter es 00 | Shelter None |
| External Wall 1 Sheltered Wall 9.1 Party Walls Description | Cavity Wall Cavity Wall Type Filled Ca | filled ca Cavity filled ca avity with ealing | vity, any outs wall: plasterb avity, any outs Construct Plasterbo | oard on dabs, AAC de structure ction ard on dabs m C blocks, cavit | ounted o | n cemen | t render (| on both | (W/m ² K) |) (kJ/m² | K) (m²) | Re | es | None Area (m |



| Description | | Constr | uction | | | | | | Kappa (kJ/m²K) | Area (m |
|---|--|----------------------|---|------------------------|-----------------------|--------------------------|---------------------|------------------|-------------------|-------------------|
| Party Ceiling 1 | Precast concrete plank floor (screed laid on insulation), carpeted | | | | | | | 30.00 | 97.20 | |
| 11.1 Party Floors | | | | | | | | | | |
| Description | | Storey Index | Construction | | | | | | Kappa (kJ/m²K) | |
| Party Floor 1 | | Lowest occupied | Precast concrete plank floor | (screed laid or | n insulation | ı), carpeted | | | 30.00 | 97.20 |
| 12.0 Opening Types | | _ | . . | | . | | | _ | _ | |
| Description | Data Source | Туре | Glazing | | Glazing Gap | Filling Type | G-value | Frame Type | Frame Factor | U Value (W/m²K |
| Entrance Doors Windows | Manufacturer Manufacturer | Solid Door Window | Double Low-E So | oft 0.05 | | Air Filled Air Filled | 0.00 0.63 | Wood Wood | 0.70 0.75 | 1.00 1.20 |
| 13.0 Openings | | | | | | | | | | |
| Name | Opening Typ | ое | Location | | Orient | | | a (m²) | | itch |
| pd1 w1 | Windows Windows | | External Wall 1 External Wall 1 | | North North | | |).80 .24 | | 0 |
| w2 | Windows Entrance Do | oro | External Wall 1 Sheltered Wall | | North South | | | .48 .10 | | 0 |
| ed1 w3 | Windows | ors | External Wall 1 | | South | | | .04 | | 0 |
| 14.0 Conservatory | | | None | | | | | | | |
| 15.0 Draught Proofing | | | 100 | | | | % | | | |
| 16.0 Draught Lobby | | | No | | | | | | | |
| | | | | | | | | | | |
| 17.0 Thermal Bridging | | | Calculate Bridges | | | | | | | |
| 17.1 List of Bridges | | | Source Type | Longth | Psi | Adjusted | Poforono | | | Importe |
| Bridge Type E1 Steel lintel with perfo | orated steel base pl | late | Independently assessed | Length 11.67 | 0.07 | 0.07 | Thermall | | | Yes |
| E4 Jamb | · | | Independently assessed | 28.10 | 0.02 | 0.02 | Knauf | , | | Yes |
| E7 Party floor between E16 Corner (normal) | dwellings (in blocks | s of flats) | Independently assessed Independently assessed | 84.30 13.50 | 0.07 0.05 | 0.07 0.05 | Knauf Knauf | | | No No |
| | describber our | | | | 0.07 | 0.07 | Knauf | | | Yes |
| E18 Party wall between | aweilings | | Independently assessed | 5.40 | 0.07 | 0.07 | Itilaai | | | |
| E8 Balcony within a dwe | | n | Table K1 - Default | 5.40 4.70 | 0.10 | 0.10 | raidai | | | No |
| E8 Balcony within a dwe continuous | elling, wall insulatio | | Table K1 - Default | 4.70 | 0.10 | 0.10 | Tuluul | | | |
| E8 Balcony within a dwe | elling, wall insulatio | | | | | | Tuldu | | | No No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed | elling, wall insulatio | dwellings | Table K1 - Default | 4.70 | 0.10 | 0.10 | Knauf | | | |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default | 4.70 15.20 | 0.10 | 0.10 | | K | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed | 4.70 15.20 | 0.10 | 0.10 | Knauf | ĸ | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² | | Pa | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² | K .m²) @ 50 F | ² a | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² | | ² a | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP50 Property Tested? | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ | elling, wall insulatio | dwellings | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed APso Property Tested? Test Method As Built APso 19.0 Mechanical Ventilation | elling, wall insulatio | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed APso Property Tested? Test Method As Built APso 19.0 Mechanical Ventilation | elling, wall insulation diate floor between internal area greate internal area greate on a second control of the control of th | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation | elling, wall insulation diate floor between internal area greate internal area greate on a construction on a construction System Presection | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 | 4.70 15.20 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed APso Property Tested? Test Method As Built APso 19.0 Mechanical Ventilation Mechanical Ventilation Approved Installat | elling, wall insulation diate floor between internal area greate internal area greate on a construction on a construction System Presection | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Approved Installation | elling, wall insulation diate floor between diate floor between diate floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal floor between diater | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Approved Installation Mechanical Ventilation Mechanical Ventilation Approved Installation Mechanical Ventilation | elling, wall insulation diate floor between diate floor between diate floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal area greated and the floor between diaternal floor between diater | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical versions assessed | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical versions assessed | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Type MV Reference Nu Configuration | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical visions 20082 1 | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Manufacturer SFF | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vi 500082 1 0.73 | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Mechanical Ventilation Type MV Reference Nu Configuration Manufacturer SFF Duct Type | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vi 500082 1 0.73 Rigid | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical V | elling, wall insulation diate floor between internal area greate internal area greate at a second at a | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vi 500082 1 0.73 Rigid | 4.70 15.20 10.80 | 0.10 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |
| E8 Balcony within a dwo continuous P3 Party wall - Intermed (in blocks of flats) E17 Corner (inverted – external area) Y-value 18.0 Pressure Testing Designed AP ₅₀ Property Tested? Test Method As Built AP ₅₀ 19.0 Mechanical Ventilation Mechanical V | on n ation System Presection ation data Type mber c Commissioning Co | dwellings er than | Table K1 - Default Table K1 - Default Independently assessed 0.06 Yes 3.00 Yes Blower Door 0.10 Yes No Database Balanced mechanical vectors 500082 1 0.73 Rigid 90.00 1 | 4.70 15.20 10.80 | 0.10 0.00 -0.09 | 0.10 | Knauf W/m² m³/(h. | .m²) @ 50 F | | No |



| 21.0 Fixed Cooling System | No | | | | |
|--|---------------------------|--------------------|------------------------------|----------------------|-------------------|
| 22.0 Lighting | | | | | |
| No Fixed Lighting | No | | | | |
| | Name Lighting 1 | Efficacy 80.00 | Power 6 | Capacity 480 | Count 10 |
| 24.0 Main Heating 1 | SAP table | | | | |
| Percentage of Heat | 100.00 | | | % | |
| Database Ref. No. | 0 | | | | |
| Fuel Type | Electricity | | | | |
| SAP Code | 224 | | | | |
| In Winter | 170.00 | | | | |
| In Summer | 170.00 | | | | |
| Controls SAP Code | 2207 | | | | |
| Delayed Start Stat | No | | | | |
| HETAS approved System | No | | | | |
| Oil Pump Inside | No | | | | |
| Fan Assisted Flue | No | | | | |
| Is MHS Pumped | Pump in heated s | pace | | | |
| Heating Pump Age | 2013 or later | | | | |
| Heat Emitter | Radiators | | | | |
| Flow Temperature | Enter value | | | | |
| Flow Temperature Value | 45.00 | | | Ħ | |
| Boiler Interlock | No | | | | |
| OF O Main Heating 2 | None | | | | |
| 25.0 Main Heating 2 | None | | | | |
| 26.0 Heat Networks | None | | | | |
| Heat Source Fuel Type Heating I | Jse Efficiency | Percentage Of Heat | eat Heat E Power Ratio | lectrical Fuel Facto | r Efficiency type |
| Heat source 1 None Heat source 2 None | | | Ratio | | |
| Heat source 3 None | | | | | |
| Heat source 4 None Heat source 5 None | | | | | |
| 28.0 Water Heating | | | | | |
| Water Heating | Main Heating 1 | | | | |
| SAP Code | 901 | | | | |
| Flue Gas Heat Recovery System | No | | | | |
| Waste Water Heat Recovery Instantaneous System 1 | No | | | | |
| Waste Water Heat Recovery Instantaneous System 2 | No | | | | |
| Waste Water Heat Recovery Storage System | No | | | | |
| Solar Panel | No | | | | |
| Water use <= 125 litres/person/day | Yes | | | | |
| Summer Immersion | No | | | | |
| Cold Water Source | | | | | |
| | From mains | | | Ī | |
| Bath Count | From mains | | | | |
| Bath Count Supplementary Immersion | | | | | |
| | 1 | | | | |
| Supplementary Immersion Immersion Only Heating Hot Water | 1 No | | | | |
| Supplementary Immersion Immersion Only Heating Hot Water 28.3 Waste Water Heat Recovery System | 1 No No | er | | | |
| Supplementary Immersion Immersion Only Heating Hot Water 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder | 1 No | er - | | | |
| Supplementary Immersion Immersion Only Heating Hot Water 28.3 Waste Water Heat Recovery System | 1 No No Hot Water Cylinde | 9F | | | |



| Jan Fe | b Mar | Apr | May Jun | Jul | Aug | Sep | Oc | t Nov | Dec |
|------------------------|-----------------------|-----------|----------------------|---------------|-----------------|----------------|---------------|---------------------------------|-----------------------|
| Electricity Generation | ı | | Annual | | | | | | |
| Connected to dwelling | g's electricity meter | | Yes | | | | | | |
| Apportioned | | | 0.00 | | | | kWh/Ye | ear | |
| Electricity Generated | | | 0.00 | | | | | | |
| 34.0 Small-scale Hydro | | | None | | | | | | |
| 0.80 | South | 30° | None Or Little | No | No | 1.00 | | Reference | |
| PV Cells kWp | Orientation | Elevation | Overshading | FGHRS | MCS Certificate | Over: Facto | shading or | MCS Certificate Reference | Panel Manufacturer |
| Battery Capacity [kW | h] | | 0.00 | | | | | | |
| Diverter | | | No | | | | | | |
| Connected To Dwelli | ng | | Yes | | | | | | |
| Export Capable Mete | r? | | Yes | | | | | | |
| 32.0 Photovoltaic Unit | | | Multiple Dwellings - | - Connected | | | | | |
| 31.0 Thermal Store | | | None | | | | | | |
| In Airing Cupboard | | | No | | | | | | |
| Pipes insulation | | | Fully insulated prim | nary pipework | | | | | |
| Loss | | | 1.70 | | | | kWh/da | ay | |
| Cylinder Volume | | | 150.00 | | | | L | | |
| Insulation Type | | | Measured Loss | | | | | | |
| Independent Time Co | ontrol | | Yes | | | | | | |

Recommendations

Lower cost measures

Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 5, Luton, Bedfordshire, LU1 3HX

Dwelling type:
Date of assessment:
Produced by:
Total floor area:
DRRN:

Flat, End-Terrace 05/07/2023 Darren Coham 97.2 m²

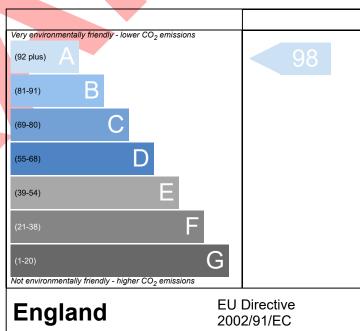
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Very energy efficient - lower running costs (92 plus) A (81-91) B (69-80) C (55-68) D (21-38) F (1-20) G Not energy efficient - higher running costs England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

Thermal Bridging



| Property Reference | Flat 5 | | | | Issued on Date | 05/07/2023 |
|------------------------------------|--------------------------|--------------|--------------|------------|------------------|------------|
| Assessment Reference | 00005 | | Pro | p Type Ref | End-Terrace Flat | |
| Property | Flat 5, Luton, Bedfordsh | ire, LU1 3HX | | | | |
| SAP Rating | | 87 B | DER | 2.86 | TER | 12.57 |
| Environmental | | 98 A | % DER < TER | | | 77.25 |
| CO ₂ Emissions (t/year) | | 0.25 | DFEE | 33.67 | TFEE | 35.44 |
| Compliance Check | | See BREL | % DFEE < TFI | E | | 4.98 |
| % DPER < TPER | | 52.73 | DPER | 31.89 | TPER | 67.46 |
| Assessor Details | л. Darren Coham | | | | Assessor ID | R789-0001 |
| Client | | | | | | |

| | Junction details | Source Type | Psi (W/mK) | Length (m) | Result | Reference |
|------------------|---|------------------------|---------------|---------------|--------|---------------------|
| External wall | E1 Steel lintel with perforated steel base plate | Independently assessed | 0.068 | 11.67 | 0.79 | Thermally Broken |
| External wall | E4 Jamb | Independently assessed | 0.018 | 28.10 | 0.51 | Knauf |
| External wall | E7 Party floor between dwellings (in blocks of flats) | Independently assessed | 0.065 | 84.30 | 5.48 | Knauf |
| External wall | E16 Corner (normal) | Independently assessed | 0.048 | 13.50 | 0.65 | Knauf |
| External wall | E18 Party wall between dwellings | Independently assessed | 0.069 | 5.40 | 0.37 | Knauf |
| External wall | E8 Balcony within a dwelling, wall insulation continuous | Table K1 - Default | 0.100 | 4.70 | 0.47 | |
| Party wall | P3 Party wall - Intermediate floor between dwellings (in blocks of flats) | Table K1 - Default | 0.000 | 15.20 | 0.00 | |
| External wall | E17 Corner (inverted – internal area greater than external area) | Independently assessed | -0.090 | 10.80 | -0.97 | Knauf |

Total: 173.67 W/mK: Y-Value: 0.06 W/m²K:

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 05 Jul 2023 11:45:15

| Project Information | | | |
|---------------------|--------------|-----------------|-------------------|
| Assessed By | Darren Coham | Building Type | Flat, Mid-terrace |
| OCDEA Registration | EES/022007 | Assessment Date | 2023-07-05 |

| Dwelling Details | | | | |
|-------------------------|------------------------|------------------|-------------------|--|
| Assessment Type | As designed | Total Floor Area | 68 m ² | |
| Site Reference | Flat 6 | Plot Reference | 00006 | |
| Address | Flat 6, Luton, LU1 3HX | | • | |

| Client Details | |
|----------------|------|
| Name | |
| Company | |
| Address | 5555 |

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

| 1a Target emission rate and dwelling emission | rate | | | |
|--|---|----|--|--|
| Fuel for main heating system | Electricity | | | |
| Target carbon dioxide emission rate | 13.18 kgCO ₂ /m ² | | | |
| Dwelling carbon dioxide emission rate | 2.73 kgCO ₂ /m ² | OK | | |
| 1b Target primary energy rate and dwelling primary energy | | | | |
| Target primary energy | 71.09 kWh _{PE} /m ² | | | |
| Dwelling primary energy | 31.86 kWh _{PE} /m ² | OK | | |
| 1c Target fabric energy efficiency and dwelling fabric energy efficiency | | | | |
| Target fabric energy efficiency | 30.2 kWh/m ² | | | |
| Dwelling fabric energy efficiency | 29.5 kWh/m ² | OK | | |

| 2a Fabric U-values | | | | |
|--------------------|---|---|---|-----|
| Element | Maximum permitted average U-Value [W/m²K] | 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 | 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, | 1.6 | 1.18 | pd1 (1.2) | ОК |
| and roof windows | | | | |
| 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 | |
| Sheltered wall: Walls (2) | 2.6349 | 0.18 | |
| Party wall: Party Wall (1) | 23.9 | 0 (!) | |

| 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] |
| pd1, Windows | 5.4 | North West | 0.75 | 1.2 |
| w1, Windows | 6.48 | North West | 0.75 | 1.2 |
| w2, Windows | 5.04 | North East | 0.75 | 1.2 |
| ed1, Entrance Doors | 2.0951 | South East | N/A | 1 (!) |

| 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 | E1: Steel lintel with perforated steel base plate | Calculated by person with suitable expertise | | Thermally Broken |
| External wall | E4: Jamb | Calculated by person with suitable expertise | 0.018 (!) | Knauf |

Date generated: 2023-07-05 11:45:15

| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
|---------------|---|--|---------------------|---------------------|
| External wall | E7: Party floor between dwellings (in blocks of flats) | Calculated by person with suitable expertise | 0.065 | Knauf |
| External wall | E18: Party wall between dwellings | Calculated by person with suitable expertise | 0.069 | Knauf |
| External wall | E8: Balcony within a dwelling - wall insulation continuous | SAP table default | 0.1 | |
| Party wall | P3: Intermediate floor between dwellings (in blocks of flats) | SAP table default | 0 (!) | |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.09 | Knauf |
| External wall | E16: Corner (normal) | Calculated by person with suitable expertise | 0.048 | Knauf |

| 3 Air permeability (better than typically expected values are flagged with a subsequent (!)) | | | |
|--|--|----|--|
| Maximum permitted air permeability at 50Pa | 8 m³/hm² | | |
| 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 | 219.3% | |
| Emitter type | Underfloor | |
| Flow temperature | 45°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 | 150 litres | |
| Declared heat loss | 1.7 kWh/day | |
| Primary pipework insulated | Yes | |
| Manufacturer | | |
| Model | | |
| Commissioning | | |
| Waste water heat recovery system 1 - type: N/A | | |
| Efficiency | | |
| Manufacturer | | |
| Model | | |

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

| 7 Lighting | | |
|---|---------|----|
| Minimum permitted light source efficacy | 75 lm/W | |
| Lowest light source efficacy | 80 lm/W | OK |
| External lights control | N/A | |

| 8 Mechanical ventilation | | | |
|--|--------------------------|--|----|
| System type: Balanced whole-house n | nechanical ventilation v | with heat recovery | |
| Maximum permitted specific fan power | 1.5 W/(l/s) | <u> </u> | |
| Specific fan power | 0.73 W/(l/s) | | OK |
| Minimum permitted heat recovery | 73% | | |
| efficiency | | | |
| Heat recovery efficiency | 90% | | OK |
| Manufacturer/Model | HRV1 Q Plus | | |
| Commissioning | | | |
| | <u>'</u> | | |
| 9 Local generation | - (4) | | |
| Technology type: Photovoltaic system | | | |
| Peak power | 0.8 kWp | | |
| Orientation | South | | |
| Pitch | 30° | | |
| Overshading | None or very little | | |
| Manufacturer | | | |
| MCS certificate | | | |
| 10 Heat networks | | | |
| N/A | | | |
| 44 Commontines de commontes sociales e | _ | | |
| 11 Supporting documentary evidence | е | | |
| N/A | | | |
| 12 Declarations | | | |
| a. Assessor Declaration | | | |
| This declaration by the assessor is o | confirmation that the co | ontents of this BREL Compliance Report | |
| are a true and accurate reflection ba | ased upon the design ir | nformation submitted for this dwelling for | |
| the purpose of carrying out the "As o | designed" assessment, | and that the supporting documentary | |
| evidence (SAP Conventions, Appen | | | |
| documentary evidence required) has | | | |
| Compliance Report. | | 1 1 3 | |
| ' | | | |
| | | | |
| Signed: | | Assessor ID: | |
| | | | |
| | | | |
| Name: | | Date: | |

b. Client Declaration

N/A



| Property Reference | | I=4 C | | | | | | | | leeu | ed on Date | 0.5 | 107/000 | 2 |
|------------------------------------|-------------------------|------------------------|--|-------------------------------|--|--|---|---------------------------------|--------------------|--|--|----------------|--|-----------------------------------|
| | | lat 6 | | | | | Ducu | Tuna | Def | | ed on Date | 05 | /07/202 | 3 |
| Assessment Reference | | 0006 | D 16 1.1. | 1114 011 | | | Prop | Type | Ket | Flat | | | | |
| Property | FI | lat 6, Luton, | Begiorasnir | re, LUT 3H. | ^ | | | | | | | | | |
| SAP Rating | | | | 89 B | | DER | | 2.73 | 3 | | TER | | 13.18 | |
| Environmental | | | | 98 A | | % DER | < TER | | | | | | 79.29 | |
| CO ₂ Emissions (t/year) | | | | 0.17 | | DFEE | | 29.5 | 52 | | TFEE | | 30.20 | |
| Compliance Check | | | | See BRE | L | % DFEI | E < TFE | ≣ | | | | | 2.26 | |
| % DPER < TPER | | | | 55.19 | | DPER | | 31.8 | 86 | | TPER | | 71.09 | |
| Assessor Details | Mr. Da | rren Coham | <u> </u> | | | | | | | | Assesso | r ID | R789-0 | 0001 |
| Client | | | | | | | | | | | | | | |
| SUMMARY FOR INPL | JT DATA | FOR: Nev | v Build (A | As Desig | ned) | | | | | | | | | |
| Orientation | | | ` | Southeas | | | | | | | | | | |
| | | | | ND | ı | | | | | | | | | |
| Property Tenture | | | | 6 | | | | | | | | | | |
| Transaction Type | | | | Urban | | | | | | | | | | |
| Terrain Type | | | | | Torross | | | | | | | | | |
| 1.0 Property Type | | | | Flat, Mid- | | | | | | | | | | |
| Position of Flat | | | | | ııdl | | | | | | | | | |
| Which Floor | | | | 3 | | | | | | | | | | |
| 2.0 Number of Storeys | | | | 1 | | | | | | | | | | |
| 3.0 Date Built | | | | 2023 | | | | | | | | | | |
| 4.0 Sheltered Sides | | | | 2 | | | | | | | | | | |
| 5.0 Sunlight/Shade | | | | | or unknown | | | | | | | | | |
| 6.0 Thermal Mass Parame | eter | | | Precise c | alculation | | | | | | | | | |
| Thermal Mass | | | | N/A | | | | | | | kJ/m²K | | | |
| 7.0 Electricity Tariff | | | | Standard | | | | | | | | | | |
| Smart electricity meter | fitted | | | Yes | | | | | | | | | | |
| Smart gas meter fitted | | | | Yes | | | | | | | | | | |
| 7.0 Measurements | | | | | | | | | | | | | | |
| | | | | G | Basemen fround floo 1st Storey 2nd Storey 3rd Storey 4th Storey 5th Storey 7th Storey | t: r: r: r: r: r: r: | 0.00 m 18.71 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m | 1 m 1 1 1 1 1 | r In | 0.00 68.2 0.00 0.00 0.00 0.00 0.00 0.00 | 1 m²) m²) m²) m²) m²) m² | Avera | 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00 | m m m m m m |
| 8.0 Living Area | | | | 29.20 | | | | | | | m² | | | |
| 9.0 External Walls | _ | | | | | | | | | | | | | |
| Description External Wall 1 | Type | Constr | | oard on deba | AAC block | | (kJ/m²K) | Area(m²) | | Res | Shelter | • | - | Type |
| Sheltered Wall | Cavity Wall Cavity Wall | filled ca Cavity | wall : plasterbo avity, any outsio wall : plasterbo avity, any outsio | de structure pard on dabs, | | 0.18 0.18 | 60.00 | 45.79 4.73 | 28.87 | 0.00 | None Stairwell Ac Corridor | | | culate Wall Are ter Gross Area |
| 9.1 Party Walls | | | | | | | | | | | | | | |
| Description | Type | | Construc | tion | | | | | U-Value (W/m²K) | Kappa | | Shelter Res | | Shelter |
| Party Wall 1 | | Cavity with Sealing | | ard on dab C blocks, c | s mounted o | n cemen | t render | on both | | 45.00 | | 0.00 | | None |
| 9.2 Internal Walls Description | | | Constructi | ion | | | | | | | | | Карра | Area (m² |
| I I. VA/- II. 4 | | | Plasterboar | rd on timbo | r frama | | | | | | | (k | J/m²K) 9.00 | 130.00 |
| Internal Wall 1 | | | | iu on unibe | i iiaiiie | | | | | | | | | |



| Description | | Consti | | | and the second | | | | | Kappa (kJ/m²K) | Area (m²) |
|---|------------------------------|----------------------|-------|--|------------------|----------------|--------------------------|--------------------|-------------------|-------------------|-------------------|
| Party Ceiling 1 | | Precas | t con | crete plank floor (screed l | aid on insulati | ion), carpet | ted | | | 30.00 | 68.21 |
| 11.1 Party Floors | | Ctorou | Con | otw.otion | | | | | | Vanna | Araa (mi |
| Description | | Storey Index | | struction | | | | | | Kappa (kJ/m²K) | , |
| Party Floor 1 | | Lowest occupied | Pred | ast concrete plank floor (| screed laid on | insulation |), carpeted | İ | | 30.00 | 68.21 |
| 12.0 Opening Types Description | Data Source | Туре | | Glazing | | Glazing | Filling | G-value | Frame | Frame | U Value |
| • | | | | Glazing | | Gap | Type | | Type | Factor | (W/m²K |
| Entrance Doors Windows | Manufacturer Manufacturer | Solid Door Window | r | Double Low-E Soft | 0.05 | | Air Filled Air Filled | | Wood Wood | 0.70 0.75 | 1.00 1.20 |
| 3.0 Openings | | | | | | | | | | | |
| Name pd1 | Opening Type Windows | ре | | Location External Wall 1 | | Orient | | Area | (m²) 40 | Pi | i tch 0 |
| w1 | Windows | | | External Wall 1 | | North \ | | 6.4 | | | 0 |
| w2 ed1 | Windows Entrance Do | ors | | External Wall 1 Sheltered Wall | | North South | | 5.0 | 04 10 | | 0 |
| 14.0 Conservatory | Entrance Be | | | None | | | Luot | <u>-</u> - | | | |
| 15.0 Draught Proofing | | | | 100 | | | | <u> </u> | | | |
| 16.0 Draught Lobby | | | | No | | | | = | | | |
| | | | | | | | | | | | |
| I7.0 Thermal Bridging I7.1 List of Bridges | | | | Calculate Bridges | | | | | | | |
| Bridge Type | | | | гсе Туре | Length | Psi | Adjusted | l Reference | ə: | | Importe |
| E1 Steel lintel with perfor E4 Jamb | rated steel base p | late | | pendently assessed pendently assessed | 8.07 18.50 | 0.07 0.02 | 0.07 0.02 | Thermally Knauf | Broken | | Yes Yes |
| E7 Party floor between d | | s of flats) | Inde | pendently assessed | 37.42 | 0.07 | 0.07 | Knauf | | | No |
| E18 Party wall between on E8 Balcony within a dwel | | n | | pendently assessed e K1 - Default | 10.80 4.50 | 0.07 0.10 | 0.07 0.10 | Knauf | | | Yes No |
| continuous P3 Party wall - Intermedia | | | | e K1 - Default | 32.90 | 0.00 | 0.00 | | | | No |
| (in blocks of flats) E17 Corner (inverted – ir | | | | pendently assessed | 2.70 | -0.09 | -0.09 | Knauf | | | No |
| external area) E16 Corner (normal) | nomar aroa groat | or triair | | pendently assessed | 2.70 | 0.05 | 0.05 | Knauf | | | No |
| Y-value | | | | 0.09 | | 0.00 | 0.00 | W/m²K | , | | |
| Description | | | | Arch | | | | vv/iii is | | | |
| · | | | | | | | | | | | |
| 18.0 Pressure Testing | | | | Yes | | | | _ | | | |
| Designed AP ₅₀ | | | | 3.00 | | | | m³/(h.r | n²) @ 50 P | a | |
| Property Tested? | | | | Yes | | | | _ | | | |
| Test Method | | | | Blower Door | | | | _ | | | |
| As Built AP ₅₀ | | | | 0.10 | | | | m³/(h.r | n²) @ 50 P | a | |
| 19.0 Mechanical Ventilation Mechanical Ventilation | 1 | | | | | | | | | | |
| Mechanical Ventila | tion System Prese | ent | | Yes | | | | | | | |
| Approved Installation | • | | | No | | | | \exists | | | |
| Mechanical Ventila | | | | Database | | | | \dashv | | | |
| Туре | • | | | Balanced mechanical ve | ntilation with h | neat recove | ery | | | | |
| MV Reference Nun | nber | | | 500082 | | | | $\bar{\Box}$ | | | |
| Configuration | | | | 1 | | | | | | | |
| Manufacturer SFP | | | | 0.73 | | | | | | | |
| Duct Type | | | | Rigid | | | | | | | |
| MVHR Efficiency | | | | 90.00 | | | | | | | |
| Wet Rooms | | | | 1 | | | | $\bar{\Box}$ | | | |
| SFP from Installer | Commissioning C | ertificate | | No | | | | $\bar{\Box}$ | | | |
| | - | | | | | | | = | | | |
| MVHR System Loc | ation | | | Inside heated envelope (| installed exclu | ısıvely) | | | | | |



| 21.0 Fixed Cooling System | No | | | | |
|--|--------------------|-----------------------|---------------------|----------------------|--------------------|
| 22.0 Lighting | | | | | |
| No Fixed Lighting | No | | | | |
| | Name Lighting 1 | Efficacy 80.00 | Power 6 | Capacity 480 | Count 10 |
| 24.0 Main Heating 1 | SAP table | | | | |
| Percentage of Heat | 100.00 | | | % | |
| Database Ref. No. | 0 | | | | |
| Fuel Type | Electricity | | | | |
| SAP Code | 224 | | | | |
| In Winter | 170.00 | | | | |
| In Summer | 170.00 | | | | |
| Controls SAP Code | 2207 | | | | |
| Delayed Start Stat | No | | | | |
| HETAS approved System | No | | | | |
| Oil Pump Inside | No | | | | |
| Fan Assisted Flue | No | | | | |
| Is MHS Pumped | Pump in heated | space | | | |
| Heating Pump Age | 2013 or later | | | | |
| Heat Emitter | Underfloor | | | | |
| Underfloor Heating | Yes - Pipes in th | in screed | | | |
| Flow Temperature | Enter value | | | | |
| Flow Temperature Value | 45.00 | | | | |
| Boiler Interlock | No | | | | |
| 25.0 Main Heating 2 | None | | | | |
| | | | | <u> </u> | |
| 26.0 Heat Networks | None | | | | |
| Heat Source Fuel Type Heating L | Jse Efficiency | Percentage Of He Heat | eat Heat E Power | lectrical Fuel Facto | r Efficiency type |
| Heat source 1 None | | | Ratio | | |
| Heat source 2 None Heat source 3 None | | | | | |
| Heat source 4 None | | | | | |
| Heat source 5 None | | | | | |
| 28.0 Water Heating Water Heating | Main Heating 1 | | | \neg | |
| SAP Code | 901 | | | \dashv | |
| Flue Gas Heat Recovery System | No | | | \dashv | |
| Waste Water Heat Recovery Instantaneous System 1 | No | | | \dashv | |
| Waste Water Heat Recovery Instantaneous System 2 | No | | | _ | |
| | | | | <u> </u> | |
| Waste Water Heat Recovery Storage System | No | | | | |
| Solar Panel | No | | | _ | |
| Water use <= 125 litres/person/day | Yes | | | _ | |
| Summer Immersion | No | | | _ | |
| Cold Water Source | From mains | | | _ | |
| Bath Count | 1 | | | | |
| Supplementary Immersion | No | | | | |
| Immersion Only Heating Hot Water | No | | | | |
| 28.3 Waste Water Heat Recovery System | | | | | |
| 29.0 Hot Water Cylinder | Hot Water Cylind | der | | | |
| Cylinder Stat | Yes | | | | |
| | | | | | |



| Jan | Feb | Mar | Apr | May Jun | Jul | Aug | Sep | Oct | t Nov | Dec |
|--------------------|----------------|---------------|-----------|----------------------|-----------------------------|-----------------|---------------|---------------|---------------------------------|-----------------------|
| Electricity Gene | eration | | | Annual | | | | | | |
| Connected to d | welling's elec | tricity meter | | Yes | | | | | | |
| Apportioned | | | | 0.00 | | | | kWh/Ye | ear | |
| Electricity Gene | erated | | | 0.00 | | | | | | |
| 34.0 Small-scale H | lydro | | | None | | | | | | |
| 0.80 | | South | 30° | None Or Little | No | No | 1.00 | | 1101010100 | |
| PV Cells | kWp | Orientation | Elevation | Overshading | FGHRS | MCS Certificate | Over Facto | shading or | MCS Certificate Reference | Panel Manufacturer |
| Battery Capacit | y [kWh] | | | 0.00 | | | | | | |
| Diverter | | | | No | | | | | | |
| Connected To D | Owelling | | | Yes | | | | | | |
| Export Capable | Meter? | | | Yes | | | | | | |
| 32.0 Photovoltaic | Unit | | | Multiple Dwellings | Connected | | | | | |
| 31.0 Thermal Store | e | | | None | | | | | | |
| In Airing Cupbo | ard | | | No | | | | | | |
| Pipes insulation | ı | | | Fully insulated prin | nary pipework | | | | | |
| Loss | | | | 1.70 | | | | kWh/da | у | |
| Cylinder Volume | е | | | 150.00 | | | | L | | |
| Insulation Type | | | | Measured Loss | | | | | | |
| Independent Tir | me Control | | | Yes | | | | | | |
| Cylinder In Hea | ted Space | | | Yes | | | | | | |

Recommendations
Lower cost measures
None
Further measures to achieve even higher standards
None

Predicted Energy Assessment



Flat 6, Luton, Bedfordshire, LU1 3HX

Dwelling type:
Date of assessment:
Produced by:
Total floor area:
DRRN:

Flat, Mid-Terrace 05/07/2023 Darren Coham 68.21 m²

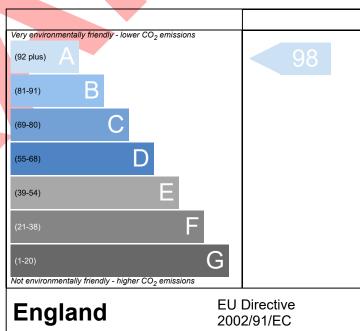
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Very energy efficient - lower running costs (92 plus) A (81-91) B (69-80) C (55-68) (1-20) F Not energy efficient - higher running costs England Eu Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

Thermal Bridging



| Property Reference | Flat 6 | | | | Issued on Date | 05/07/2023 |
|------------------------------------|--------------------------|---------------------|--------------|-------|----------------|------------|
| Assessment Reference | 00006 | 00006 Prop Type Ref | | | | |
| Property | Flat 6, Luton, Bedfordsh | ire, LU1 3HX | | | | |
| SAP Rating | | 89 B | DER | 2.73 | TER | 13.18 |
| Environmental | | 98 A | % DER < TER | | | 79.29 |
| CO ₂ Emissions (t/year) | | 0.17 | DFEE | 29.52 | TFEE | 30.20 |
| Compliance Check | | See BREL | % DFEE < TFE | E | | 2.26 |
| % DPER < TPER | | 55.19 | DPER | 31.86 | TPER | 71.09 |
| Assessor Details | Mr. Darren Coham | | | | Assessor ID | R789-0001 |
| Client | | | | | | |

| | Junction details | Source Type | Psi (W/mK) | Length (m) | Result | Reference |
|------------------|---|------------------------|---------------|---------------|--------|---------------------|
| External wall | E1 Steel lintel with perforated steel base plate | Independently assessed | 0.068 | 8.07 | 0.55 | Thermally Broken |
| External wall | E4 Jamb | Independently assessed | 0.018 | 18.50 | 0.33 | Knauf |
| External wall | E7 Party floor between dwellings (in blocks of flats) | Independently assessed | 0.065 | 37.42 | 2.43 | Knauf |
| External wall | E18 Party wall between dwellings | Independently assessed | 0.069 | 10.80 | 0.75 | Knauf |
| External wall | E8 Balcony within a dwelling, wall insulation continuous | Table K1 - Default | 0.100 | 4.50 | 0.45 | |
| Party wall | P3 Party wall - Intermediate floor between dwellings (in blocks of flats) | Table K1 - Default | 0.000 | 32.90 | 0.00 | |
| External wall | E17 Corner (inverted – internal area greater than external area) | Independently assessed | -0.090 | 2.70 | -0.24 | Knauf |
| External wall | E16 Corner (normal) | Independently assessed | 0.048 | 2.70 | 0.13 | Knauf |

Total: 117.59 W/mK:
Y-Value: 0.09 W/m²K:

Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 05 Jul 2023 11:45:15

| Project Information | | | |
|---------------------|--------------|-----------------|-------------------|
| Assessed By | Darren Coham | Building Type | Flat, End-terrace |
| OCDEA Registration | EES/022007 | Assessment Date | 2023-07-05 |

| Dwelling Details | | | |
|-------------------------|------------------------|------------------|-------------------|
| Assessment Type | As designed | Total Floor Area | 55 m ² |
| Site Reference | Flat 7 | Plot Reference | 00007 |
| Address | Flat 7, Luton, LU1 3HX | • | |

| Client Details | |
|----------------|------------|
| Name | • |
| Company | - |
| Address | -, -, -, - |

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 | 15.12 kgCO ₂ /m ² | |
| Dwelling carbon dioxide emission rate | 2.77 kgCO ₂ /m ² | OK |
| 1b Target primary energy rate and dwelling pri | mary energy | |
| Target primary energy | 81.86 kWh _{PE} /m ² | |
| Dwelling primary energy | 33.25 kWh _{PE} /m ² | OK |
| 1c Target fabric energy efficiency and dwelling | fabric energy efficiency | |
| Target fabric energy efficiency | 33.5 kWh/m ² | |
| Dwelling fabric energy efficiency | 30.5 kWh/m ² | OK |

| 2a Fabric U-values | 2a Fabric U-values | | | | | | | | |
|--------------------|---|---|---|-----|--|--|--|--|--|
| Element | Maximum permitted average U-Value [W/m²K] | 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 | 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, | 1.6 | 1.16 | pd1 (1.2) | OK | | | | | |
| and roof windows | | | | | | | | | |
| 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 [m²] U-Valu | | | | | | | | |
| Exposed wall: Walls (1) | 35.78 | 0.18 | | | | | | |
| Sheltered wall: Walls (2) | 19.2349 | 0.18 | | | | | | |
| Party wall: Party Wall (1) | 23.08 | 0 (!) | | | | | | |

| 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] | | | | | |
| pd1, Windows | 5.4 | North East | 0.75 | 1.2 | | | | | |
| w1, Windows | 3.24 | North East | 0.75 | 1.2 | | | | | |
| ed1, Entrance Doors | 2.0951 | North West | N/A | 1 (!) | | | | | |

| 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 elementJunction detailSourcePsi value [W/mK]Dra ref | | | | | | | | | |
| External wall | E1: Steel lintel with perforated steel base plate | Calculated by person with suitable expertise | 0.068 | Thermally Broken | | | | | |
| External wall | E4: Jamb | Calculated by person with suitable expertise | 0.018 (!) | Knauf | | | | | |
| External wall | E7: Party floor between dwellings (in blocks of flats) | Calculated by person with suitable expertise | 0.065 | Knauf | | | | | |
| | | | | | | | | | |

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| Main element | Junction detail | Source | Psi value [W/mK] | Drawing / reference |
|---------------|---|--|---------------------|---------------------|
| External wall | E16: Corner (normal) | Calculated by person with suitable expertise | 0.048 | Knauf |
| External wall | E18: Party wall between dwellings | Calculated by person with suitable expertise | 0.069 | Knauf |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.09 | Knauf |
| Party wall | P3: Intermediate floor between dwellings (in blocks of flats) | SAP table default | 0 (!) | Default |
| External wall | E8: Balcony within a dwelling - wall insulation continuous | SAP table default | 0.1 | Default |

| 3 Air permeability (better than typically expected values are flagged with a subsequent (!)) | | | | | | | | |
|--|--|----|--|--|--|--|--|--|
| Maximum permitted air permeability at 50Pa | 8 m³/hm² | | | | | | | |
| 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 | 219.3% | | | | | | |
| Emitter type | Underfloor | | | | | | |
| Flow temperature 45°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 | 150 litres | | | | | |
| Declared heat loss | 1.7 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 tempera | ature zone control by arrangement of plumbing and electrical services |
| Function | |
| Ecodesign class | |
| Manufacturer | |
| Model | |
| Water heating - type: Cylinder thermosta | at and HW separately timed |
| Manufacturer | |
| Model | |

| 7 Lighting | | |
|---|---------|----|
| Minimum permitted light source efficacy | 75 lm/W | |
| Lowest light source efficacy | 80 lm/W | OK |
| External lights control | N/A | |

| 8 Mechanical ventilation | | | | | | | |
|--|--------------------------|--|----|--|--|--|--|
| System type: Balanced whole-house n | nechanical ventilation v | with heat recovery | | | | | |
| Maximum permitted specific fan power | 1.5 W/(l/s) | <u> </u> | | | | | |
| Specific fan power | 0.73 W/(I/s) | | OK | | | | |
| Minimum permitted heat recovery | 73% | | | | | | |
| efficiency | | | | | | | |
| Heat recovery efficiency | 90% | | OK | | | | |
| Manufacturer/Model | HRV1 Q Plus | | | | | | |
| Commissioning | | | | | | | |
| | <u>'</u> | | | | | | |
| 9 Local generation | - (4) | | | | | | |
| Technology type: Photovoltaic system | | | | | | | |
| Peak power | 0.8 kWp | | | | | | |
| Orientation | South | | | | | | |
| Pitch 30° | | | | | | | |
| Overshading | None or very little | | | | | | |
| Manufacturer | | | | | | | |
| MCS certificate | | | | | | | |
| 10 Heat networks | | | | | | | |
| N/A | | | | | | | |
| 44 Commontines de commontes sociales e | _ | | | | | | |
| 11 Supporting documentary evidence | е | | | | | | |
| N/A | | | | | | | |
| 12 Declarations | | | | | | | |
| a. Assessor Declaration | | | | | | | |
| This declaration by the assessor is o | confirmation that the co | ontents of this BREL Compliance Report | | | | | |
| are a true and accurate reflection ba | ased upon the design ir | nformation submitted for this dwelling for | | | | | |
| the purpose of carrying out the "As o | designed" assessment, | and that the supporting documentary | | | | | |
| evidence (SAP Conventions, Appen | | | | | | | |
| documentary evidence required) has | | | | | | | |
| Compliance Report. | | 1 1 3 | | | | | |
| ' | | | | | | | |
| | | | | | | | |
| Signed: | | Assessor ID: | | | | | |
| | | | | | | | |
| | | | | | | | |
| Name: | | Date: | | | | | |

b. Client Declaration

N/A



| Property Reference | F. | . 7 | | | | | | | | Jaco | ad an Bata | | E 107 100 | 10 | |
|------------------------------------|--------------------|-------------------|--|----------------------|--|--|--|----------------------------|--------------------------|--|--|-----------------|--|--|--|
| | Fla | | | | | | Duou | Tuna | Def | | | | | 5/07/2023 | |
| Assessment Reference | 000 | | 5 16 11. | 1114.0 | | | Prop | Type | Ket | Flat | | | | | |
| Property | Fla | t 7, Luton, | Bedfordshi | re, LUT 3 | ПХ | | | | | | | | | | |
| SAP Rating | | | | 89 B | | DER | | 2.77 | 7 | | TER | | 15.12 | | |
| Environmental | | | | 98 A | | % DER | < TER | | | | | | 81.68 | | |
| CO ₂ Emissions (t/year) | | | | 0.14 | | DFEE | | 30.5 | 50 | | TFEE | | 33.51 | | |
| Compliance Check | | | | See BR | EL | % DFE | E < TFEE | | | | | | 8.99 | | |
| % DPER < TPER | | | | 59.38 | | DPER | | 33.2 | 25 | | TPER | | 81.86 | | |
| Assessor Details | Mr. Darr | en Coham | | | | | | | | | Assesso | r ID | R789- | 0001 | |
| Client | | | | | | | | | | | | | | | |
| SUMMARY FOR INPU | T DATA F | OR: Nev | / Build (| As Desi | gned) | | | | | | | | | | |
| Orientation | | | • | Northwe | | | | | | | | | | | |
| | | | | ND | 251 | | | | | | | | | | |
| Property Tenture | | | | | | | | | | | | | | | |
| Terrain Type | nsaction Type | | | | | | | | | | | | | | |
| 1.0 Property Type | | | | Urban Flat En | ıd-Terrace | | | | | | | | | | |
| Position of Flat | | | | Mid-floo | | | | | | | | | | | |
| Which Floor | | | | 3 | , nut | | | | | | | | | | |
| 2.0 Number of Storeys | | | | 1 | | | | | | | | | | | |
| 3.0 Date Built | | | | 2023 | | | | | | | | | | | |
| 4.0 Sheltered Sides | | | | 2 | | | | | | | | | | | |
| 5.0 Sunlight/Shade | | | | Average or unknown | | | | | | | | | | | |
| 6.0 Thermal Mass Parame | tor | | | Precise calculation | | | | | | | | | | | |
| Thermal Mass | tei | | | N/A | | | | | | | kJ/m²K | | | | |
| | | | | IV/A | | | | | | | KO/III IX | | | | |
| 7.0 Electricity Tariff | | | | Standar | ď | | | | | | | | | | |
| Smart electricity meter f | itted | | | Yes | | | | | | | | | | | |
| Smart gas meter fitted | | | | Yes | | | | | | | | | | | |
| 7.0 Measurements | | | | | Basemer Ground floo 1st Store 2nd Store 3rd Store 4th Store 5th Store 7th Store | nt: or: y: y: y: y: y: y: | Loss Pe 0.00 m 24.35 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m | n n i i i i | r In | 0.00 55.2 0.00 0.00 0.00 0.00 0.00 0.00 | 3 m ²) m ²) m ²) m ²) m ²) m ² | Ave | rage Sto 0.00 2.70 0.00 0.00 0.00 0.00 0.00 | 0 m 0 m 0 m 0 m 0 m 0 m | |
| 8.0 Living Area | | | | 26.61 | | | | | | | m² | | | | |
| 9.0 External Walls Description | Туре | Constr | uction | | | U-Value | Kappa | Gross | Nett Area | Shelter | Shelter | One | eninas Ar | ea Calculatio | |
| External Wall 1 | Cavity Wall | Cavity | wall : plasterb | | os, AAC block, | | (kJ/m²K) 60.00 | | | Res 0.00 | None | • | _ | Type culate Wall Are | |
| Sheltered Wall | Cavity Wall | Cavity v | vity, any outsi wall : plasterbo vity, any outsi | oard on dab | s, AAC block, | 0.18 | 60.00 | 21.33 | 19.23 | 0.90 | Stairwell Acc | | 2.10 Er | ter Gross Area | |
| 9.1 Party Walls | | 54 50 | ,,, 54.01 | | | | | | | | | | | | |
| Description | Туре | | Construc | ction | | | | | U-Value | | | Shelte | er : | Shelter | |
| Party Wall 1 | Filled C Edge S | avity with ealing | Plasterbo sides, AA | | abs mounted cavity | on cemen | t render | on both | (W/m²K) 0.00 | 45.00 (kJ/m² l | | Res 0.00 | | None | |
| 9.2 Internal Walls Description | | | Construct | ion | | | | | | | | | Kappa | Area (m² | |
| Internal Wall 1 | | | Plasterboa | pard on timber frame | | | | | | (| kJ/m²K) 9.00 | | | | |
| 10.1 Party Ceilings | | | | | | | | | | | | | | | |



| Description | Construction | | | | | | | | | Kappa (kJ/m²K) | Area (m²) |
|---|------------------------------|----------------------|---------|--|-------------------|-----------------|--------------------------|----------------|----------------------|-------------------|-------------------|
| Party Ceiling 1 | | Precas | t concr | ete plank floor (screed | iaid on insulat | ion), carpe | ted | | | 30.00 | 55.23 |
| 11.1 Party Floors Description | | Storey | Cone | ruction | | | | | | Kappa | Area (m²) |
| • | | Index | | | , | | | | | (kJ/m²K) | , , |
| Party Floor 1 | | Lowest occupied | Preca | st concrete plank floor | (screed laid or | ninsulation |), carpeted | | | 30.00 | 55.23 |
| 12.0 Opening Types | Data Source | Tuno | | Glazina | | Glazina | Eilling | G value | Frama | Frame | U Value |
| Description | | Туре | | Glazing | | Glazing Gap | Filling Type | G-value | Type | Factor | (W/m^2K) |
| Entrance Doors Windows | Manufacturer Manufacturer | Solid Door Window | r | Double Low-E So | ft 0.05 | | Air Filled Air Filled | 0.00 0.63 | Wood Wood | 0.70 0.75 | 1.00 1.20 |
| 13.0 Openings | | | _ | | | | | | | _ | |
| Name pd1 | Opening Type Windows | pe | | ocation xternal Wall 1 | | Orient North | | | a (m²) .40 | | i tch 0 |
| w1 ed1 | Windows Entrance Do | ors | | xternal Wall 1 heltered Wall | | North North | | | .24 .10 | | 0 |
| | Emilarios Bo | | | | | TTOTAL | | <u>_</u> | | | |
| 14.0 Conservatory | | | | one | | | | | | | |
| 15.0 Draught Proofing | | | | 00 | | | | % | | | |
| 16.0 Draught Lobby | | | N | 0 | | | | | | | |
| 17.0 Thermal Bridging | | | C | alculate Bridges | | | | | | | |
| 17.1 List of Bridges Bridge Type | | | Sourc | е Туре | Length | Psi | Adjusted | Referenc | ٠۵٠ | | Imported |
| E1 Steel lintel with perfora | ted steel base p | late | Indep | endently assessed | 4.62 | 0.07 | 0.07 | Thermally | | | Yes |
| E4 Jamb E7 Party floor between dw | ellings (in blocks | s of flats) | | endently assessed endently assessed | 13.70 48.70 | 0.02 0.07 | | Knauf Knauf | | | Yes No |
| E16 Corner (normal) | - , | , | Indep | endently assessed | 10.80 | 0.05 | | Knauf | | | No |
| E18 Party wall between dv E17 Corner (inverted – inte | | er than | | endently assessed endently assessed | 5.40 2.70 | 0.07 -0.09 | | Knauf Knauf | | | Yes No |
| external area) P3 Party wall - Intermediat (in blocks of flats) | e floor between | dwellings | Table | K1 - Default | 17.10 | 0.00 | 0.00 | Default | | | No |
| E8 Balcony within a dwellin continuous | ng, wall insulatio | n | Table | K1 - Default | 3.00 | 0.10 | 0.10 | Default | | | No |
| Y-value | | | 0 | 07 | | | | W/m²l | K | | |
| Description | | | A | rch | | | | | | | |
| 18.0 Pressure Testing | | | Υ | es | | | | | | | |
| Designed AP ₅₀ | | | 3 | .00 | | | | m³/(h. | m²) @ 50 P | а | |
| Property Tested? | | | Y | es | | | | | | | |
| Test Method | | | В | lower Door | | | | | | | |
| As Built AP ₅₀ | | | 0 | 10 | | | | m³/(h. | m²) @ 50 P | a | |
| 19.0 Mechanical Ventilation | | | | | | | | | | | |
| Mechanical Ventilation | 0 1 5 | | Į. | | | | | \neg | | | |
| Mechanical Ventilation | - | ent | | es | | | | _ | | | |
| Approved Installation | | | | 0 | | | | ╣ | | | |
| Mechanical Ventilation | on data Type | | | atabase | | | | \exists | | | |
| Туре | | | | alanced mechanical ve | entilation with h | neat recove | ery | _ | | | |
| MV Reference Numb | per | | 5 | 00082 | | | | ╛ | | | |
| Configuration | | | 1 | | | | | ╛ | | | |
| Manufacturer SFP | | | 0 | 73 | | | | ╛ | | | |
| Duct Type | | | R | igid | | | | | | | |
| MVHR Efficiency | | | 9 | 0.00 | | | | | | | |
| Wet Rooms | | | 1 | | | | | | | | |
| SFP from Installer Co | ommissioning C | ertificate | N | 0 | | | | | | | |
| MVHR System Locat | tion | | lr | side heated envelope | (installed exclu | usively) | | | | | |
| Duct Installation Spe | | | | evel 1 | | | | Ŧ | | | |
| 20.0 Fans, Open Fireplaces, | | | | | | | | | | | |



| 21.0 Fixed Cooling System | No | | | | |
|--|--------------------|--------------------------|---------------------|----------------------|--------------------|
| 22.0 Lighting | | | | | |
| No Fixed Lighting | No | | | | |
| | Name Lighting 1 | Efficacy 80.00 | Power 6 | Capacity 480 | Count 10 |
| 24.0 Main Heating 1 | SAP table | | | | |
| Percentage of Heat | 100.00 | | | % | |
| Database Ref. No. | 0 | | | | |
| Fuel Type | Electricity | | | | |
| SAP Code | 224 | | | | |
| In Winter | 170.00 | | | | |
| In Summer | 170.00 | | | | |
| Controls SAP Code | 2207 | | | | |
| Delayed Start Stat | No | | | | |
| HETAS approved System | No | | | | |
| Oil Pump Inside | No | | | | |
| Fan Assisted Flue | No | | | | |
| Is MHS Pumped | Pump in heated | space | | | |
| Heating Pump Age | 2013 or later | | | 7 | |
| Heat Emitter | Underfloor | | | 7 | |
| Underfloor Heating | Yes - Pipes in th | nin screed | | Ħ | |
| Flow Temperature | Enter value | | | 7 | |
| Flow Temperature Value | 45.00 | | | Ħ | |
| Boiler Interlock | No | | | Ħ | |
| 25.0 Main Heating 2 | None | | | <u>-</u> | |
| | | | | | |
| 26.0 Heat Networks | None | | | | |
| Heat Source Fuel Type Heating L | Jse Efficiency | Percentage Of He Heat | eat Heat E Power | lectrical Fuel Facto | r Efficiency type |
| Heat source 1 None | | | Ratio | | |
| Heat source 2 None | | | | | |
| Heat source 4 None | | | | | |
| Heat source 5 None | | | | | |
| 28.0 Water Heating | Main Heating 1 | | | \neg | |
| Water Heating | Main Heating 1 | | | \dashv | |
| SAP Code | 901 | | | \dashv | |
| Flue Gas Heat Recovery System | No | | | \dashv | |
| Waste Water Heat Recovery Instantaneous System 1 | No | | | - | |
| Waste Water Heat Recovery Instantaneous System 2 | No | | | _ | |
| Waste Water Heat Recovery Storage System | No | | | | |
| Solar Panel | No | | | _ | |
| Water use <= 125 litres/person/day | Yes | | | _ | |
| Summer Immersion | No | | | _ | |
| Cold Water Source | From mains | | | _ | |
| Bath Count | 1 | | | _ | |
| Supplementary Immersion | No | | | ╛ | |
| Immersion Only Heating Hot Water | No | | | | |
| 28.3 Waste Water Heat Recovery System | | | | | |
| 29.0 Hot Water Cylinder | Hot Water Cylind | der | | 7 | |
| Cylinder Stat | Yes | | | Ī | |
| | | | | _ | |