

# Building Regulations England Part L (BREL) Compliance Report

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

Date: Tue 21 Jan 2025 11:39:32

| Project Information |              |                 |                 |
|---------------------|--------------|-----------------|-----------------|
| Assessed By         | Connor Lewis | Building Type   | House, Detached |
| OCDEA Registration  | EES/032592   | Assessment Date | 2025-01-21      |

| Dwelling Details |                                           |                  |                    |
|------------------|-------------------------------------------|------------------|--------------------|
| Assessment Type  | As designed                               | Total Floor Area | 147 m <sup>2</sup> |
| Site Reference   | 6343-2                                    | Plot Reference   | 13 panels          |
| Address          | 34-44 Unit 2 Carlton Avenue, Bognor Regis |                  |                    |

| Client Details |                         |
|----------------|-------------------------|
| Name           | Client                  |
| Company        | Company                 |
| Address        | Address, Town, AA11 1AA |

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

| 1a Target emission rate and dwelling emission rate                       |                                         |  |    |
|--------------------------------------------------------------------------|-----------------------------------------|--|----|
| Fuel for main heating system                                             | Mains gas                               |  |    |
| Target carbon dioxide emission rate                                      | 9.93 kgCO <sub>2</sub> /m <sup>2</sup>  |  |    |
| Dwelling carbon dioxide emission rate                                    | 9.9 kgCO <sub>2</sub> /m <sup>2</sup>   |  | OK |
| 1b Target primary energy rate and dwelling primary energy                |                                         |  |    |
| Target primary energy                                                    | 53.04 kWh <sub>PE</sub> /m <sup>2</sup> |  |    |
| Dwelling primary energy                                                  | 49.48 kWh <sub>PE</sub> /m <sup>2</sup> |  | OK |
| 1c Target fabric energy efficiency and dwelling fabric energy efficiency |                                         |  |    |
| Target fabric energy efficiency                                          | 49.0 kWh/m <sup>2</sup>                 |  |    |
| Dwelling fabric energy efficiency                                        | 45.8 kWh/m <sup>2</sup>                 |  | OK |

| 2a Fabric U-values               |                                                        |                                               |                                         |     |
|----------------------------------|--------------------------------------------------------|-----------------------------------------------|-----------------------------------------|-----|
| Element                          | Maximum permitted average U-Value [W/m <sup>2</sup> K] | Dwelling average U-Value [W/m <sup>2</sup> K] | Element with highest individual U-Value |     |
| External walls                   | 0.26                                                   | 0.17                                          | Walls (1) (0.17)                        | OK  |
| Party walls                      | 0.2                                                    | N/A                                           | N/A                                     | N/A |
| Curtain walls                    | 1.6                                                    | N/A                                           | N/A                                     | N/A |
| Floors                           | 0.18                                                   | 0.14                                          | Ground floor (0.14)                     | OK  |
| Roofs                            | 0.16                                                   | 0.09                                          | Roof (2) (0.14)                         | OK  |
| Windows, doors, and roof windows | 1.6                                                    | 1.4                                           | Opening (1.4)                           | 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 <sup>2</sup> ] | U-Value [W/m <sup>2</sup> K] |
| Exposed wall: Walls (1)                                                                        | 111.2856                   | 0.17                         |
| Exposed wall: Walls (2)                                                                        | 11.20205                   | 0.13 (!)                     |
| Exposed wall: Walls (3)                                                                        | 49.36                      | 0.17                         |
| Ground floor: Ground floor, Ground floor                                                       | 108.6                      | 0.14                         |
| Exposed roof: Roof (1)                                                                         | 89.64                      | 0.08 (!)                     |
| Exposed roof: Roof (2)                                                                         | 5.71                       | 0.14                         |
| Exposed roof: Roof (3)                                                                         | 17.743                     | 0.14                         |

| 2c Openings (better than typically expected values are flagged with a subsequent (!)) |                        |             |              |                              |
|---------------------------------------------------------------------------------------|------------------------|-------------|--------------|------------------------------|
| Name                                                                                  | Area [m <sup>2</sup> ] | Orientation | Frame factor | U-Value [W/m <sup>2</sup> K] |
| Opening, Door                                                                         | 2.1522                 | West        | N/A          | 1.4                          |
| Opening, Window                                                                       | 0.4545                 | West        | 0.7          | 1.4                          |
| Opening, Window                                                                       | 0.4545                 | West        | 0.7          | 1.4                          |
| Opening, Window                                                                       | 2.0996                 | West        | 0.7          | 1.4                          |
| Opening, Window                                                                       | 2.0996                 | West        | 0.7          | 1.4                          |
| Opening, Window                                                                       | 2.0996                 | North       | 0.7          | 1.4                          |
| Opening, Window                                                                       | 0.69185                | North       | 0.7          | 1.4                          |
| Opening, HGD                                                                          | 2.8696                 | East        | N/A          | 1.4                          |
| Opening, Window                                                                       | 0.522                  | East        | 0.7          | 1.4                          |
| Opening, Window                                                                       | 0.522                  | East        | 0.7          | 1.4                          |

| Name                 | Area [m <sup>2</sup> ] | Orientation | Frame factor | U-Value [W/m <sup>2</sup> K] |
|----------------------|------------------------|-------------|--------------|------------------------------|
| Opening, Window      | 7.6171                 | East        | 0.7          | 1.4                          |
| Opening, Window      | 3.1436                 | East        | 0.7          | 1.4                          |
| Opening, Window      | 0.69185                | South       | 0.7          | 1.4                          |
| Opening, Window      | 0.69185                | South       | 0.7          | 1.4                          |
| Opening, Roof window | 0.329                  | West        | 0.7          | 1.3                          |
| Opening, Roof window | 0.329                  | West        | 0.7          | 1.3                          |
| Opening, Roof window | 0.329                  | West        | 0.7          | 1.3                          |
| Opening, Window      | 1.2625                 | South       | 0.7          | 1.4                          |

## 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 | E10: Eaves (insulation at ceiling level)                          | Calculated by person with suitable expertise | 0.032 (!)        |                     |
| External wall | E12: Gable (insulation at ceiling level)                          | Calculated by person with suitable expertise | 0.028 (!)        | rc                  |
| External wall | E24: Eaves (insulation at ceiling level - inverted)               | SAP table default                            | 0.15             | t                   |
| External wall | E6: Intermediate floor within a dwelling                          | SAP table default                            | 0.14             |                     |
| External wall | E13: Gable (insulation at rafter level)                           | Calculated by person with suitable expertise | 0.024 (!)        | t ir                |
| External wall | E16: Corner (normal)                                              | Calculated by person with suitable expertise | 0.033 (!)        | rc                  |
| External wall | E16: Corner (normal)                                              | Calculated by person with suitable expertise | 0.0179 (!)       | t sc                |
| External wall | E10: Eaves (insulation at ceiling level)                          | Calculated by person with suitable expertise | 0.044            | t ir                |
| Roof          | R7: Flat ceiling (inverted)                                       | SAP table default                            | 0.12             |                     |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.064           | rc                  |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.015 (!)       | t ir                |
| Roof          | R8: Roof to wall (rafter)                                         | SAP table default                            | 0.12             |                     |
| Roof          | R6: Flat ceiling                                                  | Calculated by person with suitable expertise | 0.017 (!)        | t ir                |
| External wall | E2: Other lintels (including other steel lintels)                 | Calculated by person with suitable expertise | 0.084            | t ir                |
| External wall | E2: Other lintels (including other steel lintels)                 | Calculated by person with suitable expertise | 0.026 (!)        | rc                  |
| External wall | E3: Sill                                                          | Calculated by person with suitable expertise | 0.015 (!)        |                     |
| External wall | E4: Jamb                                                          | Calculated by person with suitable expertise | 0.015 (!)        |                     |
| External wall | E5: Ground floor (normal)                                         | Calculated by person with suitable expertise | 0.0375 (!)       |                     |
| Roof          | R1: Head of roof window                                           | Calculated by person with suitable expertise | 0.061            | uni                 |
| Roof          | R2: Sill of roof window                                           | Calculated by person with suitable expertise | 0.06             | uni                 |
| Roof          | R3: Jamb of roof window                                           | Calculated by person with suitable expertise | 0.056            | uni                 |
| External wall | E3: Sill                                                          | Calculated by person with suitable expertise | 0.034 (!)        | t ir                |
| External wall | E4: Jamb                                                          | Calculated by person with suitable expertise | 0.0328 (!)       | t sc                |
| External wall | E14: Flat roof                                                    | Calculated by person with suitable expertise | 0.0536           | t sc                |

## 3 Air permeability (better than typically expected values are flagged with a subsequent (!))

|                                             |                                                  |    |
|---------------------------------------------|--------------------------------------------------|----|
| Maximum permitted air permeability at 50Pa  | 8 m <sup>3</sup> /hm <sup>2</sup>                |    |
| Dwelling air permeability at 50Pa           | 5 m <sup>3</sup> /hm <sup>2</sup> , Design value | OK |
| Air permeability test certificate reference |                                                  |    |

| 4 Space heating                                                                                                    |                     |     |
|--------------------------------------------------------------------------------------------------------------------|---------------------|-----|
| <b>Main heating system 1:</b> Boiler with radiators or underfloor heating - Mains gas                              |                     |     |
| Efficiency                                                                                                         | 88.8%               |     |
| Emitter type                                                                                                       | Radiators           |     |
| Flow temperature                                                                                                   |                     |     |
| System type                                                                                                        | Regular boiler      |     |
| Manufacturer                                                                                                       | Viessmann Ltd       |     |
| Model                                                                                                              | VITODENS 100-W      |     |
| Commissioning                                                                                                      |                     |     |
| <b>Secondary heating system:</b> N/A                                                                               |                     |     |
| Fuel                                                                                                               | N/A                 |     |
| Efficiency                                                                                                         | N/A                 |     |
| Commissioning                                                                                                      |                     |     |
| 5 Hot water                                                                                                        |                     |     |
| <b>Cylinder/store</b> - type: Cylinder                                                                             |                     |     |
| Capacity                                                                                                           | 300 litres          |     |
| Declared heat loss                                                                                                 | 2.03 kWh/day        |     |
| Primary pipework insulated                                                                                         | Yes                 |     |
| Manufacturer                                                                                                       |                     |     |
| Model                                                                                                              |                     |     |
| Commissioning                                                                                                      |                     |     |
| <b>Waste water heat recovery system 1</b> - type: N/A                                                              |                     |     |
| Efficiency                                                                                                         |                     |     |
| Manufacturer                                                                                                       |                     |     |
| Model                                                                                                              |                     |     |
| 6 Controls                                                                                                         |                     |     |
| <b>Main heating 1</b> - type: Time and temperature zone control by arrangement of plumbing and electrical services |                     |     |
| Function                                                                                                           |                     |     |
| Ecodesign class                                                                                                    |                     |     |
| Manufacturer                                                                                                       |                     |     |
| Model                                                                                                              |                     |     |
| <b>Water heating</b> - 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                                                                                           |                     |     |
| <b>System type:</b> Decentralised mechanical extract                                                               |                     |     |
| Maximum permitted specific fan power                                                                               | 0.7 W/(l/s)         |     |
| Specific fan power                                                                                                 | 0.3 W/(l/s)         | OK  |
| Minimum permitted heat recovery efficiency                                                                         | N/A                 |     |
| Heat recovery efficiency                                                                                           | N/A                 | N/A |
| Manufacturer/Model                                                                                                 | Eco dMEV+           |     |
| Commissioning                                                                                                      |                     |     |
| 9 Local generation                                                                                                 |                     |     |
| Technology type: <b>Photovoltaic system (1)</b>                                                                    |                     |     |
| Peak power                                                                                                         | 3.75 kWp            |     |
| Orientation                                                                                                        | South               |     |
| Pitch                                                                                                              | 45°                 |     |
| Overshading                                                                                                        | None or very little |     |
| Manufacturer                                                                                                       |                     |     |
| MCS certificate                                                                                                    |                     |     |

|                                                 |                     |
|-------------------------------------------------|---------------------|
| Technology type: <b>Photovoltaic system (2)</b> |                     |
| Peak power                                      | 1.125 kWp           |
| Orientation                                     | East                |
| Pitch                                           | 45°                 |
| Overshading                                     | None or very little |
| Manufacturer                                    |                     |
| MCS certificate                                 |                     |

|                         |
|-------------------------|
| <b>10 Heat networks</b> |
| N/A                     |

|                                           |
|-------------------------------------------|
| <b>11 Supporting documentary evidence</b> |
| N/A                                       |

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