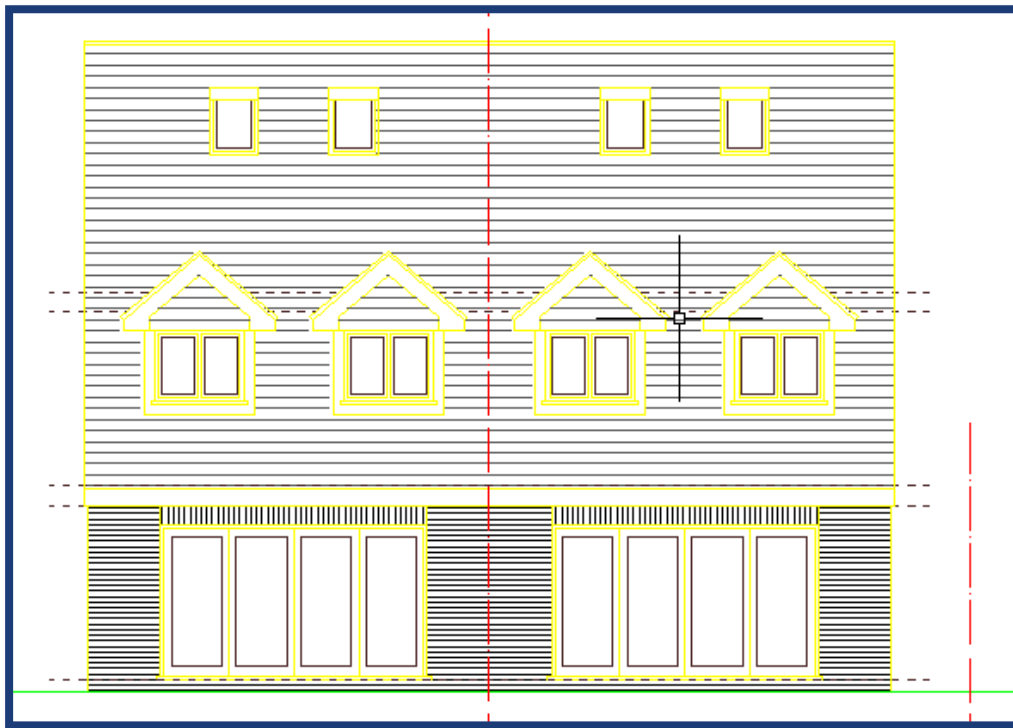




Energy Statement & SAP Compliance Report For Development at

**Land at 31 Milman Road
Reading
RG2 0AZ**

Pre Design Stage

Consultant: Wires & Wireless Ltd
28 Wheatcroft way
Swindon
SN1 2RA

Revision	Designed	Date
A	ZA	25.10.2022

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1 Executive Summary

Development at Land adjacent at 31 Milman Road, Reading, RG2 0AZ (Planning Ref: 210661/OUT) was investigated to test compliance with Part L1A (2013) of the Building Regulations. The thermal modeling has demonstrated the proposed construction is an efficient building that fully complies with the regulations and planning pre commencement target of 19% reduction in carbon emission over building regulation 2013 edition, Due to change in building regulation on 15th of June 2022, development was also investigated against Part L volume 1 2021

Pre-Commencement condition :

*1. **[Pre-commencement]** No development shall commence on site until written verification has been submitted to and approved in writing by the Local Planning Authority demonstrating that the dwellings hereby permitted have achieved a minimum of a 19% improvement in the dwelling emission rate over the target emission rate as defined in The Building Regulations for England Approved Document L1a: Conservation of Fuel and Power in New Dwellings (2013 edition), and built to the higher water efficiency standard under Regulation 36(3). Such evidence shall be in the form of a 'design stage' Standard Assessment Procedure (SAP), produced by an accredited energy assessor.*

REASON: To ensure that the development is carried out in accordance with sustainable building standards in accordance with Policy CC2 and H5 of the Reading Borough Local Plan 2019.

Part L2013 Block Compliance results:

The key results for carbon emissions are as follows:

- DER (Dwelling Emission Rate) = **12.95** kgCO₂/m².annum
- TER (Target Emission Rate) = **24.72** kgCO₂/m².annum

Hence this development achieves **47.61 %** reduction over the PartL1A target.

- DFEE (Dwelling Fabric Energy Efficiency) = **41.10** KWh/m²
- TFEE (Target Fabric Energy Efficiency) = **50.60** KWh/m²

Hence this development achieves **18.18 %** Improvement of Target.

Part L2021 Block Compliance results:

The key results for carbon emissions are as follows:

- DER (Dwelling Emission Rate) = **3.89** kgCO₂/m².annum
- TER (Target Emission Rate) = **10.63** kgCO₂/m².annum

Hence this development achieves **63.41 %** reduction over the PartL1A target.

- DFEE (Dwelling Fabric Energy Efficiency) = **35.4** KWh/m²
- TFEE (Target Fabric Energy Efficiency) = **35.80** KWh/m²

Hence this development achieves **1.12 %** Improvement of Target.

- DPER (Dwelling Primary Energy rate) = **41.81** kgCO₂/m².annum
- TPER (Target Primary Energy rate) = **55.43** kgCO₂/m².annum

Hence this development achieves **24.57 %** Improvement of Target.

Under both regulation development is able to satisfy Pre-Commencement planning condition for 19% reduction in carbon emission.

2 Introduction

This report outlines the calculations for Development at Land adjacent at **31 Milman Road, Reading, RG2 0AZ (Planning Ref: 210661/OUT)** with regards to the following:

- CO₂ emissions
- Building fabric performance
- Building services performance

The purpose of the calculations is to demonstrate compliance with 'Part L1A 2013' & Part L2021 volume 1 of the building regulations which applies to new build dwellings.

The approved SAP 2012 & SAP 10.2 calculation methodology were used to perform the analysis.

To establish the envelop areas, Architect's floor plans, elevations and section were used.

Detailed energy analysis could then be completed using FSAP 2012 (Version 1.0.5.58) & SAP 10.2 (Version – 1.0.52)

3 SAP Model

Architectural drawings were used to establish envelop areas of the dwelling:

A full list of all the documents used for creating the model can be found below:

3.1 Related Documents

3.1.1 Drawings

- Proposed Ground Floor plan – C01
- Proposed First Floor Plan – C02
- Proposed Loft Floor Plan – C03
- Proposed Roof Plan – C04
- Proposed Site Plan – C05
- Proposed Elevations – C06-C07

3.2 Modeling Assumptions

The following assumptions were made in creating the thermal model:

3.2.1 Building Fabric

Constructions

Details of the building fabric can be seen in the table below:

Element Type	U Value (W/m ² k)	G Value
Wall	0.16	-
All Roof	0.11	
Ground/Exposed Floor	0.10/0.13	
Windows	1.30	0.71
Doors	1.20	-
Skylight	1.40	0.50

Air Permeability

It is assumed the building is designed to **5.0m³/m².hr @50Pa**

3.2.2 Services

Space Heating

Air Source Heat Pump	Mitsubishi PUZ-WM85YAA
Heating Type	Underfloor Heating and Radiators
Heating Controls	Time and Temperature zone Control
Fuel Type	Electricity
Heating Efficiency (SEDBUK) (%)	359.10
Conditions/Controls	Time and temperature Zone Control

Domestic Hot Water

Cylinder details
170 Litres / 1.23 KWh/day

4 Part L Compliance

4.1 Part L1A 2013 Criteria

As a new build dwelling, the project will need to comply with Part L1A (2013) of the building regulations. This document outlines 5 criteria for compliance:

Criterion 1: (Mandatory)

“The calculated rate of CO₂ emissions from the dwelling (DER) must not be greater than the Target Emission Rate (TER)”

Criterion 2: (Guidance)

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

Criterion 3: (Guidance)

“The dwelling should have appropriate passive control measures to limit the effect of solar gains on indoor temperatures in summer”

Criterion 4: (Guidance)

“The performance of the dwelling, as built, should be consistent with the DER”

Criterion 5: (Guidance)

“The necessary provisions for energy efficient operation of the dwelling should be put in place”

Criteria 4 and 5 relate to the building after construction, so this analysis purely focuses on the first 3.

4.2 Part L Compliance Results – 2013

The full results summary can be found as below:

- Appendix A: SAP Input
- Appendix B: Regulation Compliance Report

4.3 Part L Compliance Results – 2021

The full results summary can be found as below:

- Appendix C: BREL – Building regulation England Part L

4.4 Part L Compliance Conclusion

The project achieved a DER of **112.95 kg/m²** which is **47.61 %** less than the TER under Part L2013 and DER of **3.89 kg/m²** which is **63.41%** less than the TER under Part L 2021 Volume 1. Hence the development is able to satisfy Pre- Commencement planning condition.

5 Appendix A: SAP Input

SAP Input

Property Details: Unit 1

Address: , RG2 0AZ
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 07 October 2022
 Date of certificate: 25 October 2022
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 507

Property description:

Dwelling type: House
 Detachment: Semi-detached
 Year Completed: 2022
 Floor Location: Floor area: Storey height:
 Floor 0 44.42 m² 2.35 m
 Floor 1 53.03 m² 2.58 m
 Living area: 17.1 m² (fraction 0.175)
 Front of dwelling faces: East

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
E GF Door	Manufacturer	Solid			
N GF Window	Manufacturer	Windows	double-glazed	Yes	
E GF Window	Manufacturer	Windows	double-glazed	Yes	
S GF Window	Manufacturer	Windows	double-glazed	Yes	
N Dormer Window	Manufacturer	Windows	double-glazed	Yes	
S Dormer Windowl	Manufacturer	Windows	double-glazed	Yes	
N RoofLight	Manufacturer	Roof Windows	double-glazed	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
E GF Door	mm	0.7	0.71	1.2	1.8	1
N GF Window	16mm or more	0.7	0.71	1.3	1.68	1
E GF Window	16mm or more	0.7	0.71	1.3	0.57	1
S GF Window	16mm or more	0.7	0.71	1.3	7.421	1
N Dormer Window	16mm or more	0.7	0.71	1.3	1.14	1
S Dormer Windowl	16mm or more	0.7	0.71	1.3	2.28	1
N RoofLight	16mm or more	0.7	0.5	1.4	0.9	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
E GF Door		GF External Wall	East	0	0
N GF Window	Windows (1)	GF External Wall	North	0	0
E GF Window	Windows (1)	GF External Wall	East	0	0
S GF Window	Windows (1)	GF External Wall	South	0	0
N Dormer Window	Windows (1)	Dormer Wall	North	0	0
S Dormer Windowl	Windows (1)	Dormer Wall	South	0	0
N RoofLight		Pitched Rafter	North	0.001	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
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SAP Input

External Elements

GF External Wall	48.41	11.47	36.94	0.16	0	False	N/A
FF External Wall	25.6	0	25.6	0.16	0	False	N/A
Stud Wall	22.7	0	22.7	0.16	0	False	N/A
Dormer Wall	13.98	3.42	10.56	0.16	0	False	N/A
GF Pitched Joist	1.2	0	1.2	0.11	0		N/A
Main Pitched Joist	46.49	0	46.49	0.11	0		N/A
Pitched Rafter	8.55	0.9	7.65	0.11	0		N/A
Solid Ground	44.52			0.1			N/A
Exposed Floor	9.8			0.13			N/A

Internal Elements

Party Elements

Thermal bridges:

Thermal bridges:	User-defined (individual PSI-values) Y-Value = 0.0683			
	Length	Psi-value		
	6.875	0.043	E2	Other lintels (including other steel lintels)
[Approved]	2.375	0.04	E3	Sill
[Approved]	12	0.05	E4	Jamb
[Approved]	20.6	0.16	E5	Ground floor (normal)
[Approved]	8.053	0.07	E6	Intermediate floor within a dwelling
[Approved]	7.98	0.24	E12	Gable (insulation at ceiling level)
[Approved]	2.646	0.04	E13	Gable (insulation at rafter level)
[Approved]	19.8	0.09	E16	Corner (normal)
[Approved]	2.35	-0.09	E17	Corner (inverted internal area greater than external area)
[Approved]	4.7	0.06	E18	Party wall between dwellings
	5.085	0.063	E6	Intermediate floor within a dwelling
	4.525	0.081	E16	Corner (normal)
	10.821	-0.081	E17	Corner (inverted internal area greater than external area)
	3.579	0.054	E18	Party wall between dwellings
[Approved]	3.946	0.06	E10	Eaves (insulation at ceiling level)
	10.6	0.16	P1	Ground floor
	8.572	0.12	P4	Roof (insulation at ceiling level)
	2.646	0.04	P5	Roof (insulation at rafter level)
	3.6	0.08	R1	Head
	3.6	0.06	R2	Sill
	8.5	0.08	R3	Jamb
	6.8	0.06	R6	Flat ceiling
	19.142	0.04	R7	Flat ceiling(inverted)
	6.4	0.06	R8	Roof wall (rafter)
	14.586	0.04	R9	Roof wall (flat ceiling)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	3
Number of passive stacks:	0
Number of sides sheltered:	1
Pressure test:	5

Main heating system:

Main heating system:	Heat pumps with radiators or underfloor heating
	Electric heat pumps
	Fuel: Electricity
	Info Source: Boiler Database
	Database: (rev 507, product index 106393, SEDBUK 277%):
	Brand name: Mitsubishi Electric
	Model: Ecodan 8.5kW
	Model qualifier: PUZ-WM85YAA - Underfloor
	(provides DHW all year)
	Underfloor heating and radiators, pipes in screed above insulation

SAP Input

Central heating pump : 2013 or later
Design flow temperature: Unknown
Boiler interlock: Yes

Main heating Control:

Main heating Control: Time and temperature zone control by suitable arrangement of plumbing and electrical services
Control code: 2207

Secondary heating system:

Secondary heating system: None

Water heating:

Water heating: From main heating system
Water code: 901
Fuel :Electricity
Hot water cylinder
Cylinder volume: 170 litres
Cylinder insulation: Measured loss, 1.23kWh/day
Primary pipework insulation: True
Cylinderstat: True
Cylinder in heated space: True
Solar panel: False

Others:

Electricity tariff: Standard Tariff
In Smoke Control Area: Unknown
Conservatory: No conservatory
Low energy lights: 100%
Terrain type: Low rise urban / suburban
EPC language: English
Wind turbine: No
Photovoltaics: None
Assess Zero Carbon Home: No

SAP Input

Property Details: Unit 2

Address: , RG2 0AZ
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 07 October 2022
 Date of certificate: 25 October 2022
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 507

Property description:

Dwelling type: House
 Detachment: Semi-detached
 Year Completed: 2022
 Floor Location: Floor area: Storey height:
 Floor 0 44.42 m² 2.35 m
 Floor 1 53.03 m² 2.58 m
 Living area: 17.1 m² (fraction 0.175)
 Front of dwelling faces: West

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
W GF Door	Manufacturer	Solid			
N GF Window	Manufacturer	Windows	double-glazed	Yes	
W GF Window	Manufacturer	Windows	double-glazed	Yes	
S GF Window	Manufacturer	Windows	double-glazed	Yes	
N Dormer Window	Manufacturer	Windows	double-glazed	Yes	
S Dormer Window	Manufacturer	Windows	double-glazed	Yes	
N RoofLight	Manufacturer	Roof Windows	double-glazed	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W GF Door	mm	0.7	0.71	1.2	1.8	1
N GF Window	16mm or more	0.7	0.71	1.3	1.68	1
W GF Window	16mm or more	0.7	0.71	1.3	0.57	1
S GF Window	16mm or more	0.7	0.71	1.3	7.421	1
N Dormer Window	16mm or more	0.7	0.71	1.3	1.14	1
S Dormer Window	16mm or more	0.7	0.71	1.3	2.28	1
N RoofLight	16mm or more	0.7	0.5	1.4	0.9	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
W GF Door		GF External Wall	West	0	0
N GF Window		GF External Wall	North	0	0
W GF Window		GF External Wall	West	0	0
S GF Window		GF External Wall	South	0	0
N Dormer Window		Dormer Wall	North	0	0
S Dormer Window		Dormer Wall	South	0	0
N RoofLight		Pitched Rafter	North	0.001	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
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SAP Input

External Elements

GF External Wall	48.41	11.47	36.94	0.16	0	False	N/A
FF External Wall	25.6	0	25.6	0.16	0	False	N/A
Stud Wall	22.7	0	22.7	0.16	0	False	N/A
Dormer Wall	13.98	3.42	10.56	0.16	0	False	N/A
GF Pitched Joist	1.2	0	1.2	0.11	0		N/A
Main Pitched Joist	46.49	0	46.49	0.11	0		N/A
Pitched Rafter	8.55	0.9	7.65	0.11	0		N/A
Solid Ground	44.52			0.1			N/A
Exposed Floor	9.8			0.13			N/A

Internal Elements

Party Elements

Thermal bridges:

Thermal bridges:	User-defined (individual PSI-values) Y-Value = 0.0683			
	Length	Psi-value		
	6.875	0.043	E2	Other lintels (including other steel lintels)
[Approved]	2.375	0.04	E3	Sill
[Approved]	12	0.05	E4	Jamb
[Approved]	20.6	0.16	E5	Ground floor (normal)
[Approved]	8.053	0.07	E6	Intermediate floor within a dwelling
[Approved]	7.98	0.24	E12	Gable (insulation at ceiling level)
[Approved]	2.646	0.04	E13	Gable (insulation at rafter level)
[Approved]	19.8	0.09	E16	Corner (normal)
[Approved]	2.35	-0.09	E17	Corner (inverted internal area greater than external area)
[Approved]	4.7	0.06	E18	Party wall between dwellings
	5.085	0.063	E6	Intermediate floor within a dwelling
	4.525	0.081	E16	Corner (normal)
	10.821	-0.081	E17	Corner (inverted internal area greater than external area)
	3.579	0.054	E18	Party wall between dwellings
[Approved]	3.946	0.06	E10	Eaves (insulation at ceiling level)
	10.6	0.16	P1	Ground floor
	8.572	0.12	P4	Roof (insulation at ceiling level)
	2.646	0.04	P5	Roof (insulation at rafter level)
	3.6	0.08	R1	Head
	3.6	0.06	R2	Sill
	8.5	0.08	R3	Jamb
	6.8	0.06	R6	Flat ceiling
	19.142	0.04	R7	Flat ceiling(inverted)
	6.4	0.06	R8	Roof wall (rafter)
	14.586	0.04	R9	Roof wall (flat ceiling)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	3
Number of passive stacks:	0
Number of sides sheltered:	1
Pressure test:	5

Main heating system:

Main heating system:	Heat pumps with radiators or underfloor heating
	Electric heat pumps
	Fuel: Electricity
	Info Source: Boiler Database
	Database: (rev 507, product index 106393, SEDBUK 277%):
	Brand name: Mitsubishi Electric
	Model: Ecodan 8.5kW
	Model qualifier: PUZ-WM85YAA - Underfloor
	(provides DHW all year)
	Underfloor heating and radiators, pipes in screed above insulation

SAP Input

Central heating pump : 2013 or later
Design flow temperature: Unknown
Boiler interlock: Yes

Main heating Control:

Main heating Control: Time and temperature zone control by suitable arrangement of plumbing and electrical services
Control code: 2207

Secondary heating system:

Secondary heating system: None

Water heating:

Water heating: From main heating system
Water code: 901
Fuel :Electricity
Hot water cylinder
Cylinder volume: 170 litres
Cylinder insulation: Measured loss, 1.23kWh/day
Primary pipework insulation: True
Cylinderstat: True
Cylinder in heated space: True
Solar panel: False

Others:

Electricity tariff: Standard Tariff
In Smoke Control Area: Unknown
Conservatory: No conservatory
Low energy lights: 100%
Terrain type: Low rise urban / suburban
EPC language: English
Wind turbine: No
Photovoltaics: None
Assess Zero Carbon Home: No

6 Appendix B: Regulation Compliance Report

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.5.58
Printed on 25 October 2022 at 20:03:35

Project Information:

Assessed By: Zahid Ashraf (STRO023144) **Building Type:** Semi-detached House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 97.45m²

Site Reference : 31Milman Road

Plot Reference: Unit 1

Address : , RG2 0AZ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.

It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Electricity

Fuel factor: 1.55 (electricity)

Target Carbon Dioxide Emission Rate (TER) 24.72 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 12.95 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 50.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 41.4 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.16 (max. 0.30)	0.16 (max. 0.70)	OK
Floor	0.11 (max. 0.25)	0.13 (max. 0.70)	OK
Roof	0.11 (max. 0.20)	0.11 (max. 0.35)	OK
Openings	1.29 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system:

Heat pumps with radiators or underfloor heating - electric
Mitsubishi Electric Ecodan 8.5kW

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: Measured cylinder loss: 1.23 kWh/day
Permitted by DBSCG: 2.03 kWh/day **OK**
Primary pipework insulated: Yes **OK**

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	Cylinderstat	OK
	Independent timer for DHW	OK
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: North	1.68m ²	
Windows facing: East	0.57m ²	
Windows facing: South	7.42m ²	
Windows facing: North	1.14m ²	
Windows facing: South	2.28m ²	
Roof windows facing: North	0.9m ²	
Ventilation rate:	4.00	
Blinds/curtains:	Dark-coloured curtain or roller blind	
	Closed 100% of daylight hours	

10 Key features

Roofs U-value	0.11 W/m ² K
Floors U-value	0.1 W/m ² K

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.5.58
Printed on 25 October 2022 at 20:03:35

Project Information:

Assessed By: Zahid Ashraf (STRO023144) **Building Type:** Semi-detached House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 97.45m²

Site Reference : 31Milman Road

Plot Reference: Unit 2

Address : , RG2 0AZ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.

It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Electricity

Fuel factor: 1.55 (electricity)

Target Carbon Dioxide Emission Rate (TER) 24.72 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 12.95 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 50.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 41.4 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.16 (max. 0.30)	0.16 (max. 0.70)	OK
Floor	0.11 (max. 0.25)	0.13 (max. 0.70)	OK
Roof	0.11 (max. 0.20)	0.11 (max. 0.35)	OK
Openings	1.29 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system:

Heat pumps with radiators or underfloor heating - electric
Mitsubishi Electric Ecodan 8.5kW

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: Measured cylinder loss: 1.23 kWh/day
Permitted by DBSCG: 2.03 kWh/day **OK**
Primary pipework insulated: Yes **OK**

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	Cylinderstat	OK
	Independent timer for DHW	OK
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: North	1.68m ²	
Windows facing: West	0.57m ²	
Windows facing: South	7.42m ²	
Windows facing: North	1.14m ²	
Windows facing: South	2.28m ²	
Roof windows facing: North	0.9m ²	
Ventilation rate:	4.00	
Blinds/curtains:	Dark-coloured curtain or roller blind	
	Closed 100% of daylight hours	

10 Key features

Roofs U-value	0.11 W/m ² K
Floors U-value	0.1 W/m ² K

7 Appendix C: BREL–Building Regulation England Part L

Building Regulations England Part L (BREL) Compliance Report

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

Date: Tue 25 Oct 2022 19:02:17

Project Information			
Assessed By	Zahid Ashraf	Building Type	House, Semi-detached
OCDEA Registration	STRO023144	Assessment Date	2022-10-09

Dwelling Details			
Assessment Type	As designed	Total Floor Area	97 m ²
Site Reference	Unit 2	Plot Reference	260
Address	Plot 1, 31 Milman Road, READING, RG2 0AZ		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided

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	10.63 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	3.89 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	55.43 kWh _{PE} /m ²		
Dwelling primary energy	41.81 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	35.8 kWh/m ²		
Dwelling fabric energy efficiency	35.4 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.16	GF External Wall (0.16)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.11	Item11 (0.13)	OK
Roofs	0.16	0.11	GF Pitched Joist (0.11)	OK
Windows, doors, and roof windows	1.6	1.29	7 (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 ²]	U-Value [W/m ² K]
Exposed wall: GF External Wall	36.939	0.16
Exposed wall: FF External Wall	25.6	0.16
Exposed wall: Stud Wall	22.7	0.16
Exposed wall: Dormer Wall	10.56	0.16
Ground floor: Item0	44.52	0.1 (!)
Upper floor: Item11	9.8	0.13
Exposed roof: GF Pitched Joist	1.2	0.11
Exposed roof: Main Pitched Joist	46.49	0.11
Exposed roof: Pitched Rafter	7.65	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
1, Doors	1.8	East	N/A	1.2
2, Windows (1)	1.68	North	0.7	1.3
3, Windows (1)	0.57	West	0.7	1.3
4, Windows (1)	7.421	South	0.7	1.3
5, Windows (1)	1.14	North	0.7	1.3
6, Windows (1)	2.28	South	0.7	1.3
7, Roof windows (1)	0.9	North	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	E2: Other lintels (including other steel lintels)	Government-approved scheme	0.043	Not Provided
External wall	E3: Sill	Government-approved scheme	0.04	Not Provided
External wall	E4: Jamb	Government-approved scheme	0.05	Not Provided
External wall	E5: Ground floor (normal)	Government-approved scheme	0.16	Not Provided
External wall	E6: Intermediate floor within a dwelling	Government-approved scheme	0.07	Not Provided
External wall	E12: Gable (insulation at ceiling level)	Government-approved scheme	0.24	Not Provided
External wall	E13: Gable (insulation at rafter level)	Government-approved scheme	0.04	Not Provided
External wall	E16: Corner (normal)	Government-approved scheme	0.09	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Government-approved scheme	-0.09	Not Provided
External wall	E18: Party wall between dwellings	Government-approved scheme	0.06	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	0.063	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.081	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.081	Not Provided
External wall	E18: Party wall between dwellings	Not government-approved scheme	0.054	Not Provided
External wall	E10: Eaves (insulation at ceiling level)	Government-approved scheme	0.06	Not Provided
Party wall	P1: Ground floor	Not government-approved scheme	0.16	Not Provided
Party wall	P4: Roof (insulation at ceiling level)	Not government-approved scheme	0.12	Not Provided
Party wall	P5: Roof (insulation at rafter level)	Not government-approved scheme	0.04	Not Provided
Roof	R1: Head of roof window	Not government-approved scheme	0.08	Not Provided
Roof	R2: Sill of roof window	Not government-approved scheme	0.06	Not Provided
Roof	R3: Jamb of roof window	Not government-approved scheme	0.08	Not Provided
Roof	R6: Flat ceiling	Not government-approved scheme	0.06	Not Provided
Roof	R7: Flat ceiling (inverted)	Not government-approved scheme	0.04	Not Provided
Roof	R8: Roof to wall (rafter)	Not government-approved scheme	0.06	Not Provided
Roof	R9: Roof to wall (flat ceiling)	Not government-approved scheme	0.04	Not Provided

3 Air permeability (better than typically expected values are flagged with a subsequent (!))		
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	5 m ³ /hm ² , Design value	OK
Air permeability test certificate reference	Not Provided	

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	359.1%
Emitter type	Both radiators and underfloor
Flow temperature	80°C
System type	
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A		
Fuel	N/A	
Efficiency	N/A	
Commissioning		

5 Hot water		
Cylinder/store - type: Cylinder		
Capacity	170 litres	
Declared heat loss	1.23 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	90 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation		
N/A		

10 Heat networks		
N/A		

11 Supporting documentary evidence		
N/A		

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

b. Client Declaration
N/A

Building Regulations England Part L (BREL) Compliance Report

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

Date: Tue 25 Oct 2022 19:01:51

Project Information			
Assessed By	Zahid Ashraf	Building Type	House, Semi-detached
OCDEA Registration	STRO023144	Assessment Date	2022-10-09

Dwelling Details			
Assessment Type	As designed	Total Floor Area	97 m ²
Site Reference	Unit 1	Plot Reference	260
Address	Plot 1, 31 Milman Road, READING, RG2 0AZ		

Client Details	
Name	Not Provided
Company	Not Provided
Address	Not Provided, Not Provided

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			
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Dwelling carbon dioxide emission rate	3.89 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	55.43 kWh _{PE} /m ²		
Dwelling primary energy	41.81 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	35.8 kWh/m ²		
Dwelling fabric energy efficiency	35.4 kWh/m ²		OK

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Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.16	GF External Wall (0.16)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.11	Item11 (0.13)	OK
Roofs	0.16	0.11	GF Pitched Joist (0.11)	OK
Windows, doors, and roof windows	1.6	1.29	7 (1.4)	OK
Rooflights	2.2	N/A	N/A	N/A

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External wall	E13: Gable (insulation at rafter level)	Government-approved scheme	0.04	Not Provided
External wall	E16: Corner (normal)	Government-approved scheme	0.09	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Government-approved scheme	-0.09	Not Provided
External wall	E18: Party wall between dwellings	Government-approved scheme	0.06	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	0.063	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.081	Not Provided
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External wall	E10: Eaves (insulation at ceiling level)	Government-approved scheme	0.06	Not Provided
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Party wall	P4: Roof (insulation at ceiling level)	Not government-approved scheme	0.12	Not Provided
Party wall	P5: Roof (insulation at rafter level)	Not government-approved scheme	0.04	Not Provided
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Roof	R7: Flat ceiling (inverted)	Not government-approved scheme	0.04	Not Provided
Roof	R8: Roof to wall (rafter)	Not government-approved scheme	0.06	Not Provided
Roof	R9: Roof to wall (flat ceiling)	Not government-approved scheme	0.04	Not Provided

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Efficiency	359.1%
Emitter type	Both radiators and underfloor
Flow temperature	80°C
System type	
Manufacturer	
Model	
Commissioning	

Secondary heating system: N/A		
Fuel	N/A	
Efficiency	N/A	
Commissioning		

5 Hot water		
Cylinder/store - type: Cylinder		
Capacity	170 litres	
Declared heat loss	1.23 kWh/day	
Primary pipework insulated	Yes	
Manufacturer		
Model		
Commissioning		
Waste water heat recovery system 1 - type: N/A		
Efficiency		
Manufacturer		
Model		

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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	90 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation		
N/A		

10 Heat networks		
N/A		

11 Supporting documentary evidence		
N/A		

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

b. Client Declaration
N/A