

Cylinder In H	eated Space			Yes							
Independent	Time Control			Yes							
Insulation Typ	be			Measured L	oss						
Cylinder Volu	ime			150.00					L		
Loss				1.70					kWh/da	ау	
Pipes insulati	ion			Fully insulat	ted prim	ary pipework					
In Airing Cup	board			No							
31.0 Thermal St	ore			None							
32.0 Photovolta	ic Unit			Multiple Dw	ellings –	- Connected					
Export Capal	ble Meter?			Yes							
Connected To	o Dwelling			Yes							
Diverter				No							
Battery Capa	city [kWh]			0.00							
PV Cel	ls kWp	Orientation	Elevation	Oversh	nading	FGHRS	MCS Certificate	Over Facto	shading or	MCS Certificate	Panel Manufacturer
0.80		South	30°	None C	Dr Little	No	No	1.00		Reference	
34.0 Small-scale	e Hydro			None							
Electricity Ge	nerated			0.00							
Apportioned				0.00					kWh/Ye	ear	
Connected to	dwelling's elect	ricity meter		Yes							
Electricity Ge	neration			Annual							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oc	t Nov	Dec

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

Predicted Energy Assessment



Flat 7, 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.



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. 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.

Thermal Bridging



Property Ref	Property Reference Flat 7						Issued on Date		ate Ot	05/07/2023	
Assessment	Reference		00007		Prop Type Ref End-Terrace Flat						
Property Flat 7, Luton, Bedfordshire, LU1 3HX											
SAD Dating				90 P	DEP	2.7	7		TEP		15 10
Environmon	tal.			09 D		2.1	1		TER		15.12
	.ai			96 A					TEEE		81.08
	ns (t/year)			0.14		30.	.50		IFEE		33.51
Compliance	Check			See BREL	% DFEE < TFEE						8.99
% DPER < TI	PER			59.38	DPER	33.	25		TPER		81.86
Assessor Details Mr. Darren Coham								Assess	or ID	R789-0001	
Client											
							Dei	Τ.			
	Junction details			Source Type	è	(W/mK)) ^L	(m)	Result	Reference	
External wall	E1 Steel li	ntel	with perforated steel	base plate	Independently assessed	У	0.068		4.62	0.31	Thermally Broken
External wall	E4 Jamb				Independently assessed	y	0.018		13.70	0.25	Knauf
External wall	E7 Party f	oor	between dwellings (in	n blocks of flats)	Independently assessed	y	0.065	4	48.70	3.17	Knauf
External wall	E16 Corne	er (r	ormal)		Independently assessed	y	0.048		10.80	0.52	Knauf
External wall	E18 Party	wal	l between dwellings		Independently assessed	У	0.069		5.40	0.37	Knauf
External wall	E17 Corne external a	er (ii rea)	nverted – internal are	a greater than	Independently assessed	У	-0.090		2.70	-0.24	Knauf
Party wall	P3 Party v dwellings	vall (in t	 Intermediate floor be blocks of flats) 	etween	Table K1 - Defa	ult	0.000		17.10	0.00	Default
External wall	E8 Balcon continuous	y w s	ithin a dwelling, wall i	nsulation	Table K1 - Defa	ult	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 11:45:15

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	97 m ²
Site Reference	Flat 8	Plot Reference	00008
Address	Flat 8, 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	12.57 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	2.86 kgCO ₂ /m ²	ОК
1b Target primary energy rate and dwelling primary energy	l y	
Target primary energy	67.46 kWh _{PE} /m ²	
Dwelling primary energy	31.89 kWh _{PE} /m ²	ОК
1c Target fabric energy efficiency and dwelling fabric ene	rgy efficiency	
Target fabric energy efficiency	35.4 kWh/m ²	
Dwelling fabric energy efficiency	33.7 kWh/m ²	ОК

2a Fabric U-values				
Element	Maximum permitted	Dwelling average U-Value	Element with highest	
	average U-Value [W/m ² K]	[W/m ² K]	individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	ОК
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 Fast	0.75	1.2		

2d Thermal brid	ging (better than typically expected	ed values are flagged with a subse	equent (!))			
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		

Main element	Junction detail		Source	Psi value [W/mK]	Drawing / reference
			expertise	1	
External wall	E7: Party floor between	dwellings	Calculated by person with suitable	0.065	Knauf
External wall	E16: Corner (normal)		Calculated by person with suitable	0.048	Knauf
External wall	E18: Party wall between	dwellings	Calculated by person with suitable	0.069	Knauf
			expertise		
External wall	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
3 Air permeabil	ity (better than typically	expected	values are flagged with a subsequ	uent (!))	
Maximum permit	tted air permeability at 50	Pa	8 m ³ /hm ²		
Dwelling air pern	neability at 50Pa		3 m ³ /hm ² , Design value (!)		OK
Air permeability	test certificate reference				
4 Space heating]				
Main heating sy	vstem 1: Heat pump with	radiators or	r underfloor heating - Electricity		
Efficiency		219.3%			
Emitter type		Radiators			
Flow temperature	e	45°C			
System type		Air source	heat pump		
Manufacturer					
Model					
Commissioning					
Secondary heat	ting system: N/A				
Fuel		N/A			
Efficiency		N/A			
Commissioning					
5 Hot water					
Cylinder/store -	type: Cylinder				
Capacity		150 litres			
Declared heat lo	SS	1.7 kWh/da	ay li la		
Primary pipewor	k insulated	Yes			
Manufacturer					
Model					
Commissioning					
Waste water he	at recovery system 1 - ty	ype: N/A			
Efficiency					
Manufacturer					
Model					
6 Controls	· · · · · · · · · · · · · · · · ·				·
Iviain neating 1	- type: Time and temperat	ure zone c	ontrol by arrangement of plumbing a	and electrical s	ervices
Ecodesign class					
Ivianufacturer					
	true e . Oudine de la theorem a la t		en en et el trace el		
water neating -	type: Cylinder thermostat	and HW S	eparately timed		
Madal					
7 Lighting					
Minimum permite	ted light source efficacy	75 lm/W			
Lowest light sour	rce efficacy	80 lm/W			OK
External lights co	ontrol	N/A			

o meenamear ventration			
System type: Balanced whole-house me	echanical ventilation v	vith heat recovery	
Maximum permitted specific fan power	1.5 W/(I/s)		
Specific fan power	0.73 W/(l/s)		ОК
Minimum permitted heat recovery	73%		
efficiency			
Heat recovery efficiency	90%		ОК
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	, í		
MCS certificate			
10 Heat networks	·		
N/A			
11 Supporting documentary evidence			
N1/A			
N/A			
N/A 12 Declarations			
N/A 12 Declarations a. Assessor Declaration			
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co	nfirmation that the cc	ntents of this BREL Compliance Report	
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas	nfirmation that the cc ed upon the design ir	ntents of this BREL Compliance Report formation submitted for this dwelling for	
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas the purpose of carrying out the "As de	nfirmation that the cc ed upon the design ir signed" assessment,	ntents of this BREL Compliance Report formation submitted for this dwelling for and that the supporting documentary	
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas the purpose of carrying out the "As de evidence (SAP Conventions, Appendi	nfirmation that the cc ed upon the design ir signed" assessment, ix 1 (documentary evi	ntents of this BREL Compliance Report formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum	
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Property Reference		Flat 8								Issu	ed on Date	05/07	/2023	3
Assessment Reference		00008					Prop	o Type I	Ref	Flat				
Property		Flat 8, Luto	n, Bedfordshi	ire, LU1 3	внх									
SAP Rating				87 B		DER		2.86	;		TER	12	2.57	
Environmental				98 A		% DER	< TER					77	25	
CO ₂ Emissions (t/vear)				0.25		DFEE		33.6	57		TFEE	35	5 4 4	
Compliance Check				See BE	2FI	% DFE	E < TFE	=				4	98	
% DPER < TPER				52.73		DPER		31.8	9		TPER	67	7.46	
Assessor Details	Mr. D	arren Coha	ım								Assesso	r ID R	789-0	001
Client														
SUMMARY FOR INPL		A FOR: No	ew Build (<i>i</i>	As Desi	igned)									
Orientation				Southe	ast									
Property Tenture				ND										
Transaction Type	Fransaction Type			6										
Terrain Type				Urban										
1.0 Property Type				Flat Fr	nd-Terrace									
Position of Flat				Mid flor	or flat									
Which Elecr				1010										
				4										
2.0 Number of Storeys	2.0 Number of Storeys													
3.0 Date Built	3.0 Date Built			2023										
4.0 Sheltered Sides				2										
5.0 Sunlight/Shade				Averag	e or unknown									
6.0 Thermal Mass Parame	ter			Precise	calculation									
Thermal Mass				N/A							kJ/m²K			
7.0 Electricity Tariff				Standa	rd									
Smart electricity meter f	fitted			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	Heat t: r: y: y: y: y: y: y: y:	ELoss Pe 0.00 n 42.15 r 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n	erimete n n n n n n n n n	r In	ternal F 0.00 97.2 0.00 0.00 0.00 0.00 0.00 0.00	Floor Area) m ² 0 m ²) m ²	Average	e Stor 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00	r ey Heigh t m m m m m m m m m
8.0 Living Area				37.01							m²			
9.0 External Walls	Turc	0	struction			II Velu-	Konse	Grace	Nott A	Shaltar	Chalter	Oncelle	e A	a Calaul-ti
External Wall 1	Cavity Mo	Uon	suuction	oard on det	ns AAC block	(W/m ² K)	Kappa (kJ/m ² K)	Area(m ²)	(m ²)	Res	None	Opening 25.56	S Are	a Calculation Type
Sheltered Wall	Cavity Wal	filled I Cavi	cavity, any outs ty wall : plasterb cavity any outs	ide structur oard on dat	e os, AAC block, e	0.18	60.00	28.76	26.66	0.90	Stairwell Acc	20.00 cess 2.10	Ent	er Gross Area
9.1 Party Walls			,,, oato											
Description	Тур	e	Construc	ction					U-Value	Карр	a Area	Shelter	s	helter
Party Wall 1	Fille	d Cavity wit e Sealing	h Plasterbo sides AA	ard on da	abs mounted	on cemer	nt render	on both	(W/m²K 0.00	(kJ/m² 45.00	K) (m²)) 20.52	Res 0.00		None
9.2 Internal Walls Description			Construct	ion	, ,							Kaj	opa	Area (m ²
Internal Wall 1			Plasterboa	rd on tim	ber frame							(KJ/I 9.	11 -K) 00	153.40
10.1 Party Ceilings														



Description		Constr	ruction						Kappa (kJ/m²K)	Area (m²)
Party Ceiling 1		Precas	t concrete plank floor (screed l	aid on insulat	ion), carpe	ted			30.00	97.20
11.1 Party Floors										
Description		Storey Index	Construction						Kappa (kJ/m²K)	Area (m ²)
Party Floor 1		Lowest occupied	Precast concrete plank floor (screed laid or	n insulation), carpeted	1		30.00	97.20
12.0 Opening Types										
Description	Data Source	Туре	Glazing		Glazing	Filling	G-value	Frame	Frame Factor	U Value
Entrance Doors Windows	Manufacturer Manufacturer	Solid Dool Window	Double Low-E Soft	0.05	Cup	Air Filled Air Filled	0.00 0.63	Wood Wood	0.70 0.75	1.00 1.20
13.0 Openings										
Name	Opening Ty	ре			Orient	ation	Area	(m²)	P	itch
w1	Windows		External Wall 1		North	West	3.2	80 24		0
w2 ed1	Windows	ore	External Wall 1		North	West	6.4	48 10		0
w3	Windows	013	External Wall 1		South	East	5.0	04		0
14.0 Conservatory			None							
15.0 Draught Proofing			100				%			
16.0 Draught Lobby			No							
17.0 Thermal Bridging 17.1 List of Bridges			Calculate Bridges							
Bridge Type			Source Type	Length	Psi	Adjusted	Reference	: :		Imported
E1 Steel lintel with per	rforated steel base p	olate	Independently assessed	11.67 28.10	0.07	0.07	Thermally	Broken		Yes
E7 Party floor between	n dwellings (in block	s of flats)	Independently assessed	84.30	0.07	0.02	Knauf			No
E16 Corner (normal) E18 Party wall betwee	en dwellings		Independently assessed	13.50 5 40	0.05 0.07	0.05 0.07	Knauf Knauf			No Yes
E8 Balcony within a d	welling, wall insulation	on	Table K1 - Default	4.70	0.10	0.10				No
P3 Party wall - Interme (in blocks of flats)	ediate floor between	dwellings	Table K1 - Default	15.20	0.00	0.00				No
E17 Corner (inverted - external area)	– internal area great	er than	Independently assessed	10.80	-0.09	-0.09	Knauf			No
Y-value			0.06				W/m²K			
18.0 Pressure Testing			Yes							
Designed AP50			3.00				m³/(h.r	n²) @ 50 P	а	
Property Tested?			Yes							
Test Method			Blower Door							
As Built AP50			0.10				m³/(h.r	n²) @ 50 P	а	
19.0 Mechanical Ventilat	ion									
Mechanical Ventilation	on									
Mechanical Vent	tilation System Pres	ent	Yes							
Approved Install	ation		No							
Mechanical Vent	tilation data Type		Database							
Туре			Balanced mechanical ver	ntilation with I	neat recove	ery				
MV Reference N	lumber		500082				7			
Configuration			1				=			
Manufacturer SF	-р		0.73				Ξ			
			Rigid				=			
							4			
	y		90.00				4			
Wet Rooms			1							
SFP from Installe	er Commissioning C	ertificate	No							
MVHR System L	ocation		Inside heated envelope (installed exclu	usively)					
Duct Installation	Specification		Level 1							

20.0 Fans, Open Fireplaces, Flues



21.0 Fixed Cooling System	No					
22.0 Lighting						
No Fixed Lighting	No					
	Name Lighting 1	Efficacy 80.00	Power 6	Capa 48	acity 30	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	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 Typ	be Heating Use Efficiency Perce	ntage Of Heat	Heat	Electrical	Fuel Factor	Efficiency type

	Heat Source	Fuel Type Heating Use	Efficiency Percentage Of Heat	Heat	Heat Power	Electrical	Fuel Factor	Efficiency type
					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						
3.3 Waste Water Heat Recovery System							

29.0 Hot Water Cylinder Hot Water Cylinder Cylinder Stat Yes Cylinder In Heated Space Yes



Independent	Time Control			Yes						
Insulation Ty	pe			Measured Loss						
Cylinder Vol	ume			150.00				L		
Loss				1.70				kWh/da	ıy	
Pipes insula	tion			Fully insulated pri	mary pipework					
In Airing Cu	oboard			No						
31.0 Thermal S	tore			None						
32.0 Photovolta	aic Unit			Multiple Dwellings	- Connected					
Export Capa	ble Meter?			Yes						
Connected 1	o Dwelling			Yes						
Diverter				No						
Battery Cap	acity [kWh]			0.00						
PV Ce	lls kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Over Facto	shading or	MCS Certificate Reference	Panel Manufacturer
0.80		South	30°	None Or Little	e No	No	1.00		Reference	
34.0 Small-scal	e Hydro			None						
Electricity G	enerated			0.00						
Apportioned				0.00				kWh/Ye	ar	
Connected t	o dwelling's elec	ctricity meter		Yes						
Electricity G	eneration			Annual						
Jan	Feb	Mar	Apr	May Jun	Jul	Aug	Sep	Oct	t Nov	Dec

Recommendations Lower cost measures

None

Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 8, 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.



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. 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.

Thermal Bridging



Property Ref	ference	Flat 8						Issue	ed on Da	6/07/2023		
Assessment	Reference		00008		Prop Type Ref End-Terrace Flat							
Property Flat 8, Luton, Bedfordshire, LU1 3HX				ire, LU1 3HX								
SAP Rating 87 B			87 B	DER	2.86	3		TER		12 57		
Environment	tal			98 A	% DER < TER		-				77.25	
CO ₂ Emissio	ns (t/year)			0.25	DFEE	33.6	67		TFEE		35.44	
Compliance	Check			See BREL	% DFEE < TFEE						4.98	
% DPER < TI	PER			52.73	DPER	31.8	39		TPER		67.46	
Assessor Details Mr. Darren Coham								Assess	or ID	R789-0001		
Client												
	Junction details			Source Type		Psi (W/mK)	Le	ength (m)	Result	Reference		
External wall	E1 Steel li	intel	with perforated steel	base plate	Independently assessed	'	0.068	1	1.67	0.79	Thermally Broken	
External wall	E4 Jamb				Independently assessed	'	0.018	2	8.10	0.51	Knauf	
External wall	E7 Party f	loor	between dwellings (ir	n blocks of flats)	Independently assessed	'	0.065	8	4.30	5.48	Knauf	
External wall	E16 Corne	er (r	ormal)		Independently assessed	'	0.048	1	3.50	0.65	Knauf	
External wall	E18 Party wall between dwellings			Independently assessed	'	0.069	Ę	5.40	0.37	Knauf		
External wall	E8 Balcony within a dwelling, wall insulation continuous			Table K1 - Defa	ult	0.100	4	4.70	0.47			
Party wall	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)			Table K1 - Default 0.00		0.000	1	15.20 0.00				
External wall	E17 Corne external a	er (i rea)	nverted – internal area	a greater than	Independently assessed	'	-0.090	1	0.80	-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 9	Plot Reference	00009
Address	Flat 9, 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	13.18 kgCO ₂ /m ²						
Dwelling carbon dioxide emission rate	2.73 kgCO ₂ /m ²	ОК					
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	ОК					
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	ОК					

2a Fabric U-values										
Element	Maximum permitted	Dwelling average U-Value	Element with highest							
	average U-Value [W/m ² K]	[W/m ² K]	individual U-Value							
External walls	0.26	0.18	Walls (1) (0.18)	ОК						
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 (!)					

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	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					
		expertise							

Main element	Junction detail		Source	Psi value [W/mK]	Drawing /			
External wall	E7: Party floor between	dwellings	Calculated by person with suitable	0.065	Knauf			
External wall	E18: Party wall betwee	n dwellings	Calculated by person with suitable	0.069	Knauf			
External wall	E8: Balcony within a dv	velling -	SAP table default	0.1				
Portu woll	wall insulation continuo	US	SAD toble default	0 (1)				
Faily wall	dwellings (in blocks of f	lats)		0 (!)				
External wall	E17: Corner (inverted -	internal nal area)	Calculated by person with suitable	-0.09	Knauf			
External wall	E16: Corner (normal)		Calculated by person with suitable expertise	0.048	Knauf			
3 Air permeabili	ty (better than typically	v expected	values are flagged with a subsequ	uent (!))				
Maximum permit	ted air permeability at 50)Pa	$8 m^3/hm^2$					
Dwelling air perm	eability at 50Pa		3 m ³ /hm ² . Design value (!)		ОК			
Air permeability to	est certificate reference							
			I					
4 Space heating	· · · · · · · · · · · · · · · · · · ·							
Main heating sy	stem 1: Heat pump with	radiators of	r underfloor heating - Electricity					
		219.3%						
Emitter type		Underfloor						
Flow temperature)	45°C						
System type		Air source	neat pump					
Manufacturer								
Model								
Commissioning								
Secondary heat	ing system: N/A							
Fuel N/A								
Efficiency		N/A						
Commissioning								
5 Hot water								
Cylinder/store -	type: Cylinder							
Capacity	,, ,	150 litres						
Declared heat los	S	1.7 kWh/da	ay					
Primary pipework	insulated	Yes						
Manufacturer								
Model								
Commissioning								
Waste water hea	at recovery system 1 -	type: N/A						
Efficiency								
Manufacturer								
Model								
6 Controls								
Main heating 1 -	type: Time and tempera	ature zone c	ontrol by arrangement of plumbing a	and electrical ser	vices			
Function	J							
Ecodesian class								
Manufacturer								
Model								
Water heating -	type: Cylinder thermoste	at and HW s	eparately timed					
Manufacturer	.,							
Model								
7 Lighting								
Minimum permitte	ea light source efficacy	75 Im/W			01/			
Lowest light sour	ce efficacy	80 lm/W			UK			
External lights co	ntrol	N/A						

o meenamear ventration	8 Mechanical ventilation							
System type: Balanced whole-house mechanical ventilation with heat recovery								
Maximum permitted specific fan power	1.5 W/(I/s)							
Specific fan power	0.73 W/(l/s)	0.73 W/(I/s)						
Minimum permitted heat recovery	73%							
efficiency								
Heat recovery efficiency	90%		ОК					
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	, í							
MCS certificate								
10 Heat networks	·							
N/A								
11 Supporting documentary evidence								
N/A								
N/A								
N/A 12 Declarations								
N/A 12 Declarations a. Assessor Declaration								
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co	nfirmation that the cc	ntents of this BREL Compliance Report						
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas	nfirmation that the cc ed upon the design ir	ntents of this BREL Compliance Report formation submitted for this dwelling for						
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Property Reference		Flat 9	Flat 9						Issi	ued <u>on Date</u>	05	07/202	23		
Assessment Reference		00009						Pror	o Type i	Ref	Flat				
Property		Flat 9 1	uton	Bedfordshi	re IU13	знх					That				
.1				Doaronaonn											
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		29.5	52		TFEE		30.20	
Compliance Check			See BF	REL	% DFE	E < TFE	=					2.26			
% DPER < TPER					55.19		DPER		31.8	6		TPER		71.09	
Assessor Details	Mr.	Darren C	oham									Assesso	r ID	R789-	0001
Client															
SUMMARY FOR INPL	JT DAT	A FOR:	Nev	v Build (<i>i</i>	As Desi	igned)									
Orientation					Southe	ast									
Property Tenture					ND										
Transaction Type					6										
Terrain Type					Urban										
1.0 Property Type					Flat, Mi	id-Terrace									
Position of Flat					Mid-floo	or flat									
Which Floor					4										
2.0 Number of Storeys					1										
3.0 Date Built					2023										
4.0 Sheltered Sides					2										
5.0 Sunlight/Shade					Averag	e or unknown									
6.0 Thermal Mass Parame	eter				Precise	e calculation									
Thermal Mass					N/A						kJ/m²K				
7 0 Electricity Tariff					Standa	rd									
Smart electricity meter	fitted				Ves										
Smart das meter fitted	inted				Ves										
					103										
7.0 Measurements						Basemer Ground floo 1st Store 2nd Store 3rd Store 4th Store 5th Store 6th Store 7th Store	Heat t: r: y: y: y: y: y: y: y:	ELOSS Pe 0.00 m 18.71 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m	erimete n n n n n n n n	r In	ternal I 0.0 68.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Floor Area 0 m ² 21 m ² 0 m ²	Avera	ge Sto 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00	orey Height) m) m) m) m) m) m) m) m
8.0 Living Area					29.20							m²			
9.0 External Walls															
Description	Туре		Constr	uction			U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m ²)	Shelter Res	Shelter	Openi	ngs Ar	ea Calculation Type
External Wall 1 Sheltered Wall	Cavity Wa	all	Cavity v filled ca Cavity v filled ca	y wall : plasterboard on dabs, AAC block, cavity, any outside structure y wall : plasterboard on dabs, AAC block, cavity, any outside structure			0.18 0.18	60.00 60.00	45.79 4.73	28.87 2.63	0.00 0.90	None Stairwell Act Corridor	16.9 cess 2.1 4	92 Calı 0 En	culate Wall Are ter Gross Area
9.1 Party Walls															
Description	Ту	be		Construc	tion					U-Value	Kapp	Area	Shelter	:	Shelter
Party Wall 1	Fill Edg	ed Cavity ge Sealin	y with g	Plasterbo sides, AA	ard on da C blocks	abs mounted , cavity	on cemen	nt render	on both	(vv/m²K) 0.00	(кJ/m 45.0	(m²) 0 23.90	Res 0.00		None
9.2 Internal Walls Description				Construct	ion	-							K (F	appa	Area (m²)
Internal Wall 1				Plasterboa	rd on tim	ber frame							(K	9.00	130.00
10.1 Party Ceilings															



11.1 Party Floors Description Storey Construction Ka	
Description Storey Construction Ka	
INAN	ppa Area (m²)
Party Floor 1 Lowest Precast concrete plank floor (screed laid on insulation), carpeted 30 occupied	m²K)).00 68.21
12.0 Opening Types Description Data Source Type Glazing Glazing Filling G-value Frame Fr	ame U Value
Gap Type Type Fa Entrance Doors Manufacturer Solid Door Air Filled 0.00 Wood 0 Windows Manufacturer Window Double Low-E Soft 0.05 Air Filled 0.63 Wood 0	ctor(W/m²K).701.00.751.20
13.0 Openings	
Name Opening Type Location Orientation Area (m²)	Pitch
pd1 Windows External Wall 1 North West 5.40 w1 Windows External Wall 1 North West 6.48	0
w2 Windows External Wall 1 North East 5.04	Ō
ed 1 Entrance Doors Sneitered Wall South East 2.10	0
14.0 Conservatory None	
15.0 Draught Proofing 100 %	
16.0 Draught Lobby No	
17 0 Thormal Bridging	
17.1 List of Bridges	
Bridge Type Length Psi Adjusted Reference:	Imported
E1 Steel lintel with perforated steel base plate Independently assessed 8.07 0.07 0.07 Thermally Broken	Yes
E7 Party floor between dwellings (in blocks of flats) Independently assessed 37.42 0.07 0.07 Knauf	No
E18 Party wall between dwellings Independently assessed 10.80 0.07 0.07 Knauf E8 Balcony within a dwelling, wall insulation Table K1 - Default 4.50 0.10 0.10	Yes No
continuous P3 Party well Intermediate floor between dwellinge Table K1. Default 22.00 0.00 0.00	No
(in blocks of flats)	NO
E17 Corner (inverted – internal area greater than Independently assessed 2.70 -0.09 -0.09 Knauf external area)	No
E16 Corner (normal) Independently assessed 2.70 0.05 0.05 Knauf	No
Y-value 0.09 W/m ² K	
Description	
18.0 Pressure Testing Yes	
Designed AP₅₀ m³/(h.m²) @ 50 Pa	
Property Tested? Yes	
Test Method Blower Door	
As Built AP ₅₀ 0.10 m ³ /(h.m ²) @ 50 Pa	
19.0 Mechanical Ventilation	
Mechanical Ventilation	
Mechanical Ventilation System Present Yes	
Approved Installation No	
Mechanical Ventilation data Type Database	
Type Balanced mechanical ventilation with heat recovery	
MV Reference Number 500082	
Configuration 1	
Manufacturer SFP 0.73	
Duct Type Rigid	
MVHR Efficiency 90.00	
Wet Rooms 1	
SFP from Installer Commissioning Certificate No	
MVHR System Location Inside heated envelope (installed exclusively)	
Duct Installation Specification	



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 sp	ace			
Heating Pump Age	2013 or later				
Heat Emitter	Underfloor				
Underfloor Heating	Yes - Pipes in thin	screed			
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 L	lse Efficiency P	ercentage Of H Heat	eat Heat E Power	lectrical Fuel Factor	Efficiency typ
Heat source 1NoneHeat source 2NoneHeat source 3NoneHeat source 4NoneHeat source 5None			Kallo		
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

 Cylinder Stat

Yes



Cylinder In H	eated Space			Yes							
Independent	Time Control			Yes							
Insulation Typ	be			Measured L	oss						
Cylinder Volu	ime			150.00					L		
Loss				1.70					kWh/da	ау	
Pipes insulati	ion			Fully insulat	ted prim	ary pipework					
In Airing Cup	board			No							
31.0 Thermal St	ore			None							
32.0 Photovolta	ic Unit			Multiple Dw	ellings –	- Connected					
Export Capal	ble Meter?			Yes							
Connected To	o Dwelling			Yes							
Diverter				No							
Battery Capa	city [kWh]			0.00							
PV Cel	ls kWp	Orientation	Elevation	Oversh	nading	FGHRS	MCS Certificate	Over Facto	shading or	MCS Certificate	Panel Manufacturer
0.80		South	30°	None C	Dr Little	No	No	1.00		Reference	
34.0 Small-scale	e Hydro			None							
Electricity Ge	nerated			0.00							
Apportioned				0.00					kWh/Ye	ear	
Connected to	dwelling's elect	ricity meter		Yes							
Electricity Ge	neration			Annual							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oc	t Nov	Dec

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

Predicted Energy Assessment



Flat 9, 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

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Thermal Bridging



Property Ref	erence		Flat 9		Issued on Date 05/07/2023						
Assessment	Reference		00009		Prop	Туре	Ref	Mid-T	errace Fla	at	
Property Flat 9, Luton, Bedfordshire, LU1 3HX											
SAP Rating				89 B	DER	27	'3		TER		13 18
Environment	tal			98 A	% DER < TER	2.1	0]			79.29
CO₂ Emissio	ns (t/year)			0.17	DFEE	29.	52		TFEE		30.20
Compliance	Check			See BREL	% DFEE < TFEE						2.26
% DPER < TI	PER			55.19	DPER	31.	.86		TPER		71.09
									•	10	
Assessor De	tails	Mr.	Darren Coham						Assess	sor ID	R789-0001
Client											
	Junction details				Source Type		Psi (W/mK)		.ength (m)	Result	Reference
External wall	E1 Steel li	intel	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 f	loor	between dwellings (ir	n blocks of flats)	Independently assessed	/	0.065	;	37.42	2.43	Knauf
External wall	E18 Party	wa	l between dwellings		Independently assessed	/	0.069		10.80	0.75	Knauf
External wall	E8 Balcon continuou	ithin a dwelling, wall i	Table K1 - Defa	ult	0.100		4.50	0.45			
Party wall	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)				Table K1 - Defa	ult	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 Corne	er (r	ormal)		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 10	Plot Reference	000010
Address	Flat 10, 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	ОК
1b Target primary energy rate and dwelling primary energy	IY	
Target primary energy	81.86 kWh _{PE} /m ²	
Dwelling primary energy	33.25 kWh _{PE} /m ²	ОК
1c Target fabric energy efficiency and dwelling fabric ene	rgy efficiency	
Target fabric energy efficiency	33.5 kWh/m ²	
Dwelling fabric energy efficiency	30.5 kWh/m ²	ОК

2a Fabric U-values				
Element	Maximum permitted	Dwelling average U-Value	Element with highest	
	average U-Value [W/m ² K]	[W/m ² K]	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)	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)	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 brid	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						
		expertise								
External wall	E7: Party floor between dwellings	Calculated by person with suitable	0.065	Knauf						
	(in blocks of flats)	expertise								

Main element	Junction detail		Source	Psi value [W/mK1	Drawing /
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	Calculated by person with suitable	-0.09	Knauf
Down	area greater than exter	nai area)	experiise	0 (1)	Defe
Party wall	dwellings (in blocks of f	flats)	SAP table default	0 (!)	Default
External wall	E8: Balcony within a dv wall insulation continuo	velling - ous	SAP table default	0.1	Default
0 Air normoobili					
3 Air permeabili	ty (better than typically	y expected	values are flagged with a subsequence $\frac{1}{2}$ m ³ /hm ²	lent (!))	
Dwolling oir porm	ee all permeability at 50	JPa	$\frac{3}{11}$ $\frac{111}{1111}$		OK
Air permeability to	est certificate reference				UK
7 in permeability to					
4 Space heating	etem 1. Lloct mune	redictore			
	stem 1: Heat pump with	radiators of	underfloor neating - Electricity		
		219.3%			
Elimiter type					
System type	5	Air source	heat nump		
Manufacturer		All Source	neat pump		
Model					
Commissioning					
Secondary heati	ing evetem: N/A				
Fuel		N/A			
Efficiency		N/A			
Commissioning		10// (
5 Hot water	turna Culindar				
Cylinder/store -	type: Cylinder	150 litroo			
Declared heat les	20	1 7 kWb/dc			
Declared fleat los	insulated		ty		
Manufacturer	Insulated	165			
Model					
Commissioning					
Waste water bea	at recovery system 1 -	type: N/A			
Efficiency	a recovery system r				
Manufacturer					
Model					
		I			
6 Controls	type: Time and tempor	ature zone o	ontrol by arrangement of plumbing a	and electrical or	nvices
Function	type. Time and tempera		ontion by arrangement of plumbing a	and electrical se	
Function Ecodesign class					
Manufacturer					
Model					
Water heating -	type: Cylinder thermosta	at and HW o	eparately timed		
Manufacturer					
Model					
		1			
7 Lighting		751 241			
Minimum permitte	ea light source efficacy	75 lm/W			01/
Lowest light sour	ce emicacy				UK
External lights CO		IN/A			

o meenamear ventration							
System type: Balanced whole-house me	echanical ventilation v	vith heat recovery					
Maximum permitted specific fan power	1.5 W/(I/s)						
Specific fan power	0.73 W/(l/s)		ОК				
Minimum permitted heat recovery	73%						
efficiency							
Heat recovery efficiency	90%		ОК				
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	, í						
MCS certificate							
10 Heat networks	·						
N/A							
11 Supporting documentary evidence							
N/A							
N/A							
N/A 12 Declarations							
N/A 12 Declarations a. Assessor Declaration							
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co	nfirmation that the cc	ntents of this BREL Compliance Report					
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas	nfirmation that the cc ed upon the design ir	ntents of this BREL Compliance Report formation submitted for this dwelling for					
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas the purpose of carrying out the "As de	nfirmation that the cc ed upon the design ir signed" assessment,	ntents of this BREL Compliance Report formation submitted for this dwelling for and that the supporting documentary					
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas the purpose of carrying out the "As de evidence (SAP Conventions, Appendi	nfirmation that the cc ed upon the design ir signed" assessment, ix 1 (documentary evi	ntents of this BREL Compliance Report formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum					
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas the purpose of carrying out the "As de evidence (SAP Conventions, Appendidocumentary evidence required) has	nfirmation that the cc ed upon the design ir signed" assessment, ix 1 (documentary evi been reviewed in the	ntents of this BREL Compliance Report formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL					
N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas the purpose of carrying out the "As de evidence (SAP Conventions, Appendidocumentary evidence required) has Compliance Report.	nfirmation that the co ed upon the design ir esigned" assessment, ix 1 (documentary evi been reviewed in the	ntents of this BREL Compliance Report formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL					
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N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is co are a true and accurate reflection bas the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report. Signed: Name: b. Client Declaration	nfirmation that the cc ed upon the design ir esigned" assessment, ix 1 (documentary evi been reviewed in the	ntents of this BREL Compliance Report formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID: Date:					



Property Reference		Flat 10									Issu	ued on <u>Date</u>	05/	07/202	3
Assessment Reference		000010	0010 Prop Type Ref Flat												
Property		Flat 10,	Luton	, Bedfordsl	nire, LU1	ЗНХ									
SAD Dating							DEP		0.77	,		TED		45.40	
					89 B				2.77			IER		15.12	
Environmental					98 A		% DER	< IER						81.68	
					0.14				30.5	0		IFEE		33.51	
					See Br		% DFE	E < IFE	=			TOFO		8.99	
% DPER < IPER					59.38		DPER		33.2	5		IPER		81.86	
Assessor Details	Mr.	Darren (Coham									Assesso	r ID	R789-(0001
Client															
SUMMARY FOR INPL	JT DAT	A FOR	: Nev	v Build (A	As Desi	igned)									
Orientation					Northw	est									
Property Tenture					ND										
Transaction Type					6										
Terrain Type					Urban										
1.0 Property Type					Flat, Er	nd-Terrace									
Position of Flat					Mid-floo	or flat									
Which Floor					4										
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	eter				Precise calculation										
Thermal Mass					N/A							kJ/m²K			
7.0 Electricity Tariff					Standa	rd									
Smart electricity meter	fitted				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	Heat t: r: /: /: /: /: /: /: /:	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	erimete n n n n n n n n n	r In	ternal I 0.0 55.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Floor Area 0 m ² 23 m ² 0 m ²	Avera	ge Sto 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00	rey Height m m m m m m m m m
8.0 Living Area					26.61							m²			
9.0 External Walls	T		0				11.14-1	Karre	0	No44 A	Ch alta	0114			
Description	Cavity M	all	Covitu		oard on de	as AAC block	0-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	(m ²)	Res	Shelter	Upeni		Type
Sheltered Wall	Cavity W	all	filled ca Cavity v filled ca	waii : plasterb wity, any outs wall : plasterb wity, any outs	ide structur oard on dal ide structur	e os, AAC block, e	0.18	60.00	-+4.42 21.33	19.23	0.90	Stairwell Acc Corridor	o.o cess 2.1 4	o En	ter Gross Area
9.1 Party Walls															
Description	Ту	ре		Construc	tion					U-Value (W/m ² K)	Kapp	a Area ²K) (m²)	Shelter Res	\$	Shelter
Party Wall 1	Fill Ed	ed Cavit ge Sealii	y with	Plasterbo sides, AA	ard on da C blocks	abs mounted o , cavity	on cemen	t render	on both	0.00	45.0	0 23.08	0.00		None
9.2 Internal Walls Description				Construct	ion								K (k	appa J/m²K)	Area (m²
Internal Wall 1				Plasterboa	rd on tim	ber frame								9.00	90.00
10.1 Party Ceilings															



Description		Const	ruction	laid on insulat	ion) carpe	ted			Kappa (kJ/m ² K)	Area (m²)
		FIELds			.on, carpe				55.00	55.25
Description		Storey	Construction						Kanna	Δrea (m²)
Party Floor 1		Index Lowest	Precast concrete plank floor (screed laid or	n insulation), carpeted			(kJ/m²K) 30.00	55.23
		occupied								
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 Doo Window	r Double Low-E Sof	t 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 Ty	pe	Location		Orient	ation	Area	(m²)	Pi	tch
w1	Windows		External Wall 1		North	East	3.	24		0
ed1	Entrance Do	oors	Sheltered Wall		North	West	2.	10		0
14.0 Conservatory			None							
15.0 Draught Proofing			100				%			
16.0 Draught Lobby			No				Ξ			
17.0 Thermal Bridging			Calculate Bridges							
17.1 List of Bridges			Course Turne	I an atla	Dei	A aliu a ta al	Defenses			luon onto d
E1 Steel lintel with perform	ated steel base p	olate	Source Type Independently assessed	Length 4.62	PSI 0.07	Adjusted 0.07	Thermally	e: Broken		Yes
E4 Jamb			Independently assessed	13.70	0.02	0.02	Knauf			Yes
E/ Party floor between dv E16 Corner (normal)	wellings (in block	s of flats)	Independently assessed	48.70 10.80	0.07	0.07	Knauf Knauf			No No
E18 Party wall between d	dwellings		Independently assessed	5.40	0.07	0.07	Knauf			Yes
E17 Corner (inverted – in external area) P3 Party wall - Intermedia	iternal area great ate floor between	er than dwellings	Independently assessed Table K1 - Default	2.70 17.10	-0.09 0.00	-0.09 0.00	Knauf Default			No No
(in blocks of flats) E8 Balcony within a dwel continuous	lling, wall insulatio	on	Table K1 - Default	3.00	0.10	0.10	Default			No
Y-value			0.07				W/m²k			
Description			Arch							
18.0 Pressure Testing			Yes							
			3.00					n²) @ 50 P	2	
Designed Al 30			Vee					11)@301	a	
			Tes				4			
			Blower Door							
As Built AP ₅₀			0.10				m³/(h.ı	n²) @ 50 P	а	
19.0 Mechanical Ventilation Mechanical Ventilation	1									
Mechanical Ventilat	tion System Pres	ent	Yes							
Approved Installation	on		No							
Mechanical Ventilat	tion data Type		Database				Ξ			
Type	51		Balanced mechanical ve	ntilation with I	heat recove	erv	=			
MV Reference Num	nhor		500082				=			
Configuration			1							
			0.70				4			
			0.73							
Duct Type			Rigia				4			
MVHR Efficiency			90.00				_			
Wet Rooms			1							
SFP from Installer (Commissioning C	Certificate	No							
MVHR System Loca	ation		Inside heated envelope	installed exclu	usively)					
Duct Installation Sp	ecification		Level 1				ī			
20.0 Eano Onon Firenia	Eluco		L							



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 sp	ace			
Heating Pump Age	2013 or later				
Heat Emitter	Underfloor				
Underfloor Heating	Yes - Pipes in thin	screed			
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 L	lse Efficiency P	ercentage Of H Heat	eat Heat E Power	lectrical Fuel Factor	Efficiency typ
Heat source 1NoneHeat source 2NoneHeat source 3NoneHeat source 4NoneHeat source 5None			Kallo		
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

 Cylinder Stat

Yes



Cylinder In H	eated Space			Yes							
Independent	Time Control			Yes							
Insulation Typ	be			Measured L	oss						
Cylinder Volu	ime			150.00					L		
Loss				1.70					kWh/da	ау	
Pipes insulati	ion			Fully insulat	ted prim	ary pipework					
In Airing Cup	board			No							
31.0 Thermal St	ore			None							
32.0 Photovolta	ic Unit			Multiple Dw	ellings –	- Connected					
Export Capal	ble Meter?			Yes							
Connected To	o Dwelling			Yes							
Diverter				No							
Battery Capa	city [kWh]			0.00							
PV Cel	ls kWp	Orientation	Elevation	Oversh	nading	FGHRS	MCS Certificate	Over Facto	shading or	MCS Certificate	Panel Manufacturer
0.80		South	30°	None C	Dr Little	No	No	1.00		Reference	
34.0 Small-scale	e Hydro			None							
Electricity Ge	nerated			0.00							
Apportioned				0.00					kWh/Ye	ear	
Connected to	dwelling's elect	ricity meter		Yes							
Electricity Ge	neration			Annual							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oc	t Nov	Dec

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

Predicted Energy Assessment



Flat 10, 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.



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. 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.

Thermal Bridging



Property Ref	erence	Flat 10				Issued on Date		ate OS	05/07/2023		
Assessment	Reference		000010		Prop Type Ref End-Terrace Flat						
Property Flat 10, Luton, Bedfordshire, LU1 3HX											
SAP Rating 80 B			DER	27	77		TFR		15 12		
Environmental Q8 A			% DER < TER	2.1	1				81.68		
CO. Emissions (threat)			0.14	DFEE	30	50		TFEE		33.51	
Compliance	Check			See BREI	% DFFF < TFI	FF	.00				8 99
% DPFR < TI	PFR			50 38			25		TPFR		81.86
				00.00	BIER	00	.20				01.00
Assessor De	tails	Mr.	Darren Coham						Assess	or ID	R789-0001
Client											
	Junction details			Source Ty	ре	Psi (W/mK) L	_ength (m)	Result	Reference	
External wall	E1 Steel li	ntel	with perforated steel	base plate	Independer assessed	ntly I	0.068	1	4.62	0.31	Thermally Broken
External wall	E4 Jamb				Independer assessed	ntly I	0.018		13.70	0.25	Knauf
External wall	E7 Party f	oor	between dwellings (in	n blocks of flats)	Independer assessed	ntly I	0.065		48.70	3.17	Knauf
External wall	E16 Corne	er (r	ormal)		Independer assessed	ntly I	0.048		10.80	0.52	Knauf
External wall	E18 Party	wal	l between dwellings		Independer assessed	ntly I	0.069		5.40	0.37	Knauf
External wall	E17 Corne external a	er (ii rea)	nverted – internal are	a greater than	Independer assessed	ntly I	-0.090		2.70	-0.24	Knauf
Party wall	P3 Party v dwellings	vall (in t	 Intermediate floor be blocks of flats) 	etween	Table K1 - De	fault	0.000		17.10	0.00	Default
External wall	E8 Balcon continuous	y w s	ithin a dwelling, wall i	nsulation	Table K1 - De	fault	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 11:45:16

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	54 m ²
Site Reference	Flat 11	Plot Reference	000011
Address	Flat 11, 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	17.34 kgCO ₂ /m ²				
Dwelling carbon dioxide emission rate	3.44 kgCO ₂ /m ²	ОК			
1b Target primary energy rate and dwelling primary energy					
Target primary energy	93.78 kWh _{PE} /m ²				
Dwelling primary energy	40.1 kWh _{PE} /m ²	ОК			
1c Target fabric energy efficiency and dwelling fabric energy efficiency					
Target fabric energy efficiency	43.5 kWh/m ²				
Dwelling fabric energy efficiency	40.7 kWh/m ²	ОК			

2a Fabric U-values	3			
Element	Maximum permitted	Dwelling average U-Value	Element with highest	
	average U-Value [W/m ² K]	[W/m ² K]	individual U-Value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors,	1.6	1.17	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)	48.14	0.18				
Sheltered wall: Walls (2)	8.8449	0.18				
Party wall: Party Wall (1)	14.99	0 (!)				
Exposed roof: Roof (1)	59.63	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]		
pd1, Windows	5.4	North West	0.75	1.2		
w1, Windows	3.24	North West	0.75	1.2		
ed1, Entrance Doors	2.0951	North East	N/A	1 (!)		
w2, 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 - I	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			
		expertise					

Main element	Junction detail		Source	Psi value	Drawing /			
				[W/mK]	reference			
External wall	E7: Party floor between dwellings (in blocks of flats) e		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	n dwellings	Calculated by person with suitable	0.069	Knauf			
External wall	E17: Corner (inverted -	internal	Calculated by person with suitable	-0.09	Knauf			
	area greater than extern	nal area)	expertise					
External wall	wall insulation continuous		SAP table default	0.1				
Party wall	P3: Intermediate floor between dwellings (in blocks of flats)		SAP table default	0 (!)	Default			
External wall	E14: Flat roof		Calculated by person with suitable	0.052				
			expertise					
3 Air permeabili	ty (better than typically	v expected	values are flagged with a subsequ	uent (!))				
Maximum permit	ted air permeability at 50)Pa	8 m ³ /hm ²					
Dwelling air perm	neability at 50Pa		3 m³/hm², Design value (!)		ОК			
Air permeability to	est certificate reference							
4 Space heating								
Main heating sy	stem 1: Heat pump with	radiators or	r underfloor heating - Electricity					
Efficiency		219.3%						
Emitter type		Underfloor						
Flow temperature	9	45°C						
System type		Air source	Air source heat pump					
Manufacturer								
Model								
Commissioning								
Secondary heat	ing system: N/A							
Fuel		N/A						
Efficiency		N/A						
Commissioning								
5 Hot water								
Cylinder/store -	type: Cylinder							
Capacity		150 litres						
Declared heat los	SS	1.7 kWh/day						
Primary pipework	c insulated	Yes						
Manufacturer								
Model								
Commissioning								
Waste water hea	at recovery system 1 - t	ype: N/A						
Efficiency								
Manufacturer								
Model								
6 Controls	·							
Main heating 1 -	type: Time and tempera	iture zone c	ontrol by arrangement of plumbing a	and electrical servi	ces			
Function								
Ecodesign class								
Madal								
	to us as Osulling days the survey of		en en este ha time e el					
water heating -	type: Cylinder thermosta	it and HW s	eparately timed					
Model								
7 Lighting								
Minimum permitte	ed light source efficacy	75 lm/W						
Lowest light sour	ce efficacy	80 lm/W		0	K			
External lights co	ontrol	N/A						

8 Mechanical ventilation							
System type: Balanced whole-house me	chanical ventilation v	with heat recovery					
Maximum permitted specific fan power	1.5 W/(I/s)						
Specific fan power	0.73 W/(l/s)		ОК				
Minimum permitted heat recovery	73%						
efficiency							
Heat recovery efficiency	90%		ОК				
Manufacturer/Model	HRV1 Q Plus	HRV1 Q Plus					
Commissioning	nmissioning						
9 Local generation							
Technology type: Photovoltaic system	(1)						
Peak nower	0.8 kWp						
Orientation	South	Couth					
Pitch	30°						
Overshading	None or very little						
Manufacturer							
MCS certificate							
NOO certificate							
10 Heat networks							
N/A							
11 Supporting documentary evidence							
N/A							
12 Declarations							
a. Assessor Declaration			1				
This declaration by the assessor is co	nfirmation that the co	intents of this BREL Compliance Report					
are a true and accurate reflection bas	ed upon the design ir	formation submitted for this dwelling for					
the purpose of carrying out the "As de	signed" assessment,	and that the supporting documentary					
evidence (SAP Conventions, Appendi	evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum						
documentary evidence required) has been reviewed in the course of preparing this BBEI							
documentary evidence required) has l	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL					
Compliance Report.	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL					
Compliance Report.	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL					
Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL					
Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID:					
Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID:					
Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID:					
Compliance Report. Signed: Name:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:					
Compliance Report. Signed:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:					
Compliance Report. Signed: Name:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:					



Property Reference		Flat 11		Issu							ued on Date 05/07/2023				
Assessment Reference		000011				Prop Type Ref Flat					t				
Property		Flat 11,	Luton	Bedfordsh	nire, LU1										
		· · · ·													
SAP Rating				87 B		DER	3.44			TER	17.34				
Environmental					98 A		% DER	ER < TER					8	0.16	
CO₂ Emissions (t/year)					0.17		DFEE		40.7	2		TFEE	4	3.54	
Compliance Check				See BF	REL	% DFE	E < TFEE					6	.48		
% DPER < TPER					57.24		DPER		40.1	0		TPER	9	3.78	
Assessor Details	Mr.	Darren C	Coham									Assesso	r ID R	789-00	01
Client															
SUMMARY FOR INPL	JT DAT	A FOR	: Nev	/ Build (/	As Desi	igned)									
Orientation					Northe	ast									
Property Tenture					ND										
Transaction Type					6										
Terrain Type					Urban										
1.0 Property Type					Flat, Er	nd-Terrace									
Position of Flat					Mid-flo	or flat									
Which Floor					5										
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	eter				Precise calculation										
Thermal Mass					N/A							kJ/m²K			
					Standa	rd									
7.0 Electricity Tariff				Standard											
Smart electricity meter fitted				Yes											
Smart gas meter illed					res										
7.0 Measurements						Basemen Ground floo 1st Storey 2nd Storey 3rd Storey 4th Storey 5th Storey 7th Storey	Heat :: :: :: :: :: :: :: :: :: :	Loss Pe 0.00 m 26.95 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m	erimete 1 1 1 1 1 1 1 1 1 1 1	r In	ternal F 0.00 53.7 0.00 0.00 0.00 0.00 0.00 0.00	Floor Area D m ² '2 m ² D	Averag	e Store 0.00 n 2.70 n 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n	ey Height า า า า า า า
8.0 Living Area					25.93							m²			
9.0 External Walls	_		_						_						
Description	Туре		Constr	uction	المراجع		U-Value (W/m ² K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m ²)	Shelter Res	Shelter	Opening	gs Area	Calculation Type
External Wall 1	Cavity W Cavity W	all	Cavity v filled ca Cavity v filled ca	vaii : plasterb vity, any outs vall : plasterb vity, any outs	der on dabs, AAC block, de structure bard on dabs, AAC block, de structure		0.18 0.18	60.00	10.94	40.10 8.84	0.90	None Stairwell Acc Corridor 4	13.68 cess 2.10 4) Enter	ate vvall Are Gross Area
9.1 Party Walls															
Description	Ту	ре		Construc	tion					U-Value	Kapp	a Area K) (m²)	Shelter	Sh	elter
Party Wall 1	Fill Ed	ed Cavity ge Sealir	y with	Plasterbo sides, AA	ard on da C blocks	abs mounted o , cavity	n cemen	t render	on both	0.00	45.00) 14.99	0.00	N	one
9.2 Internal Walls Description				Construct	ion								Ka (k.l/	ppa m²K)	Area (m²)
Internal Wall 1 Plasterboa				rd on tim	ber frame							9.	00	78.46	
10.0 External Roofs															



Description	Туре	Type Construction			U-Value Kappa Gross Net (W/m²K)(kJ/m²K)Area(m²) Area			r Shelte Factor	CalculationOpenings Type			
External Roof 1	External Flat Roof	ternal Flat Plasterboard, insulated flat roof			9.00 5	9.63 0.	00 None	0.00	Enter Gross Area	s 0.00		
10.1 Party Ceilings Description							Kappa (kJ/m²K)	Area (m²)				
Party Ceiling 1		Precas	t concrete plank floor (screed	laid on insulat	tion), carpe	ted			30.00	53.72		
11.1 Party Floors Description Party Floor 1		Storey Index Lowest	Construction Precast concrete plank floor (screed laid o	n insulation), carpeted	1		Kappa (kJ/m²K) 30.00	Area (m²) 53.72		
12.0 Opening Types		occupicu										
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 Doo Window	r Double Low-E Sof	t 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 w1 ed1 w2	Opening Ty Windows Windows Entrance Do Windows	pe pors	Location External Wall 1 External Wall 1 Sheltered Wall External Wall 1		Orient North North North South	ation West West East East	Area 5.4 3.2 2.1 5.0	(m²) 0 24 0	Pit (((tch D D D D D		
44.0.0			News				_					
14.0 Conservatory			None									
15.0 Draught Proofing			100				%					
16.0 Draught Lobby			No									
17.0 Thermal Bridging 17.1 List of Bridges			Calculate Bridges									
 Bridge Type E1 Steel lintel with perforated steel base plate E4 Jamb E7 Party floor between dwellings (in blocks of flats) E16 Corner (normal) E18 Party wall between dwellings E17 Corner (inverted – internal area greater than external area) E8 Balcony within a dwelling, wall insulation continuous P3 Party wall - Intermediate floor between dwellings (in blocks of flats) 			Source Type Independently assessed Independently assessed Independently assessed Independently assessed Independently assessed	Length 6.72 18.50 53.90 10.80 5.40 5.40	Psi 0.07 0.02 0.07 0.05 0.07 -0.09	Adjusted 0.07 0.02 0.07 0.05 0.07 -0.09	Thermally Broken Knauf Knauf Knauf Knauf Knauf		Yes Yes No No Yes No			
			Table K1 - Default Table K1 - Default	2.40 11.10	0.10 0.00	0.10 0.00	Default		No No			
E14 Flat roof			Independently assessed	25.08	0.05	0.05				No		
Y-value			0.05				W/m²K					
Description			Arch									
18 0 Pressure Testing			Yes									
		3.00	3.00					Pa				
Property Tested?			Ves	Yes								
Test Method			Blower Door				\exists					
As Built AP ₅₀		0.10	0.10					 m³/(h.m²) @ 50 Pa				
19.0 Mechanical Ventilat	ion							, 0				
Mechanical Ventilati	on											
Mechanical Ven	tilation System Pres	ent	Yes									
Approved Install	ation	No										
Mechanical Ven	Database											
Туре			Balanced mechanical ve	ntilation with	heat recove	ery						
MV Reference N	lumber	500082	500082									
Configuration		1	1									
Manufacturer SF	P	0.73	0.73									
Duct Type		Rigid	Rigid									
MI/UD Efficience						=						
	y		30.00									



	Г <u>.</u>	1
Wet Rooms]
SFP from Installer Commissioning Certificate	No]
MVHR System Location	Inside heated envelope (installed exclusively)]
Duct Installation Specification	Level 1]
20.0 Fans, Open Fireplaces, Flues		
21.0 Fixed Cooling System	No]
22.0 Lighting		
No Fixed Lighting	No]
	NameEfficacyPowerLighting 180.006	CapacityCount48010
24.0 Main Heating 1	SAP table	
Percentage of Heat	100.00	%
Database Ref. No.	0	1
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 thin screed]
Flow Temperature	Enter value]
Flow Temperature Value	45.00]
Boiler Interlock	No]
25.0 Main Heating 2	None]
		1
26.0 Heat Networks	None	
Heat Source Fuel Type Heating U Heat source 1 None Heat source 2 None Heat source 2 None	se Efficiency Percentage Of Heat Heat Ele Heat Power Ratio	trical Fuel Factor Efficiency type
Heat source 3 None Heat source 4 None Heat source 5 None		
28.0 Water Heating	Main Heating 1	l
SAP Code]
Flue Gas Heat Recovery System]
Waste Water Heat Recovery Instantaneous System 1	No]
Waste Water Heat Recovery Instantaneous System 2	No	1
Waste Water Heat Recovery Storage System	No	1
Solar Panel	No]
Water use <= 125 litras/parson/day	Vec	1
Summer Immercian		1
]
Cold Water Source]
Dath Count	<u> </u>]


Supplementary Immersion			No						
Immersion Only Heating Hot	Water		No						
28.3 Waste Water Heat Recover	ry System								
29.0 Hot Water Cylinder			Hot Water Cylinde	r					
Cylinder Stat			Yes						
Cylinder In Heated Space			Yes						
Independent Time Control			Yes						
Insulation Type			Measured Loss						
Cylinder Volume			150.00				L		
Loss			1.70				kWh/da	y	
Pipes insulation			Fully insulated prin	nary pipework					
In Airing Cupboard			No						
31.0 Thermal Store			None						
32.0 Photovoltaic Unit			Multiple Dwellings	- Connected					
Export Capable Meter?			Yes						
Connected To Dwelling			Yes						
Diverter			No						
Battery Capacity [kWh]			0.00						
PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Over: Facto	shading or	MCS Certificate	Panel Manufacturer
0.80	South	30°	None Or Little	No	No	1.00		Reference	
34.0 Small-scale Hydro			None						
Electricity Generated			0.00						
Apportioned			0.00				kWh/Ye	ar	
Connected to dwelling's elect	ricity meter		Yes						
Electricity Generation			Annual						
Jan Feb	Mar	Apr	May Jun	Jul	Aug	Sep	Oct	t Nov	Dec

Recommendations Lower cost measures

None

Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 11, Luton, Bedfordshire, LU1 3HX

Dwelling type: Date of assessment: Produced by: Total floor area: DRRN: Flat, End-Terrace 05/07/2023 Darren Coham 53.72 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.



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. 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.

Thermal Bridging



Property Ref	erence		Flat 11					Issued on Date 05/07/2023			/07/2023
Assessment	Reference		000011			Prop Typ	be Ref	End-Terrace Flat			
Property Flat 11, Luton, Bedfordshire, LU1 3HX											
SAP Rating				87 B	DER	3.	.44	TE	TER		17.34
Environmen	tal			98 A	% DER <	TER					80.16
CO ₂ Emissio	ns (t/year)			0.17	DFEE	4	0.72	TFI	E		43.54
Compliance	Check			See BREL	% DFEE	< TFEE					6.48
% DPER < TI	PER			57.24	DPER	4	0.10	TPI	R		93.78
Assessor De	etails	Mr.	Darren Coham					As	essor ID		R789-0001
Client											
	Junction	deta	ails		Source	е Туре	Psi (W/mK)	Leng (m)	h Resi	ult	Reference
External wall	E1 Steel li	ntel	with perforated steel	base plate	Indeper asse	ndently ssed	0.068	6.72	0.4	6	Thermally Broken
External wall	E4 Jamb				Indepei asse	ndently ssed	0.018	18.5	0.3	3	Knauf
External wall	E7 Party f	loor	between dwellings (ir	n blocks of flats)	Indepei asse	ndently ssed	0.065	53.9) 3.5	0	Knauf
External wall	E16 Corne	er (r	ormal)		Indepei asse	ndently ssed	0.048	10.8	0.5	2	Knauf
External wall	E18 Party	wal	l between dwellings		Indepei asse	ndently ssed	0.069	5.40	0.3	7	Knauf
External wall	E17 Corne external a	E17 Corner (inverted – internal area greater than external area)		a greater than	Indepei asse	ndently ssed	-0.090	5.40	-0.4	9	Knauf
External wall	E8 Balcon continuous	Balcony within a dwelling, wall insulation		Table K1	- Default	0.100	2.40	0.24	4		
Party wall	P3 Party v dwellings	vall (in k	 Intermediate floor be blocks of flats) 	etween	Table K1	- Default	0.000	11.10	0.0	0	Default
External wall	E14 Flat re	oof			Indeper asse	ndently ssed	0.052	25.08	3 1.3	0	

Total:	139.30	W/mK:
Y-Value:	0.05	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 11:45:16

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 12	Plot Reference	000012			
Address	Flat 12, 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	12.22 kgCO ₂ /m ²			
Dwelling carbon dioxide emission rate	2.86 kgCO ₂ /m ²	ОК		
1b Target primary energy rate and dwelling primary energy	l y			
Target primary energy	65.61 kWh _{PE} /m ²			
Dwelling primary energy	31.96 kWh _{PE} /m ²	ОК		
1c Target fabric energy efficiency and dwelling fabric energy efficiency				
Target fabric energy efficiency	33.8 kWh/m ²			
Dwelling fabric energy efficiency	31.8 kWh/m ²	ОК		

2a Fabric U-values							
Element	Maximum permitted	Dwelling average U-Value	Element with highest				
	average U-Value [W/m ² K]	[W/m ² K]	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)	41.18	0.18			
Sheltered wall: Walls (2)	36.7849	0.18			
Party wall: Party Wall (1)	35.5	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	6.48	North West	0.75	1.2	
w1, Windows	6.48	North West	0.75	1.2	
ed1, Entrance Doors	2.0951	South East	N/A	1 (!)	

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))							
Building part 1 - I	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			
expertise							

Main element	Junction detail		Source	Psi value	Drawing /		
External wall	F6: Intermediate floor w	vithin a	Calculated by person with suitable		Knauf		
	dwelling		expertise	0.002 (:)			
External wall	E7: Party floor between	dwellings	Calculated by person with suitable	0.065	Knauf		
Esternal II	(in blocks of flats)		expertise	0.040	Kanad		
External wall	E16: Corner (normal)		Calculated by person with suitable	0.048	Knaut		
External wall	E18: Party wall between dwellings		expertise Calculated by person with suitable	0.069	Knauf		
Party wall	P3: Intermediate floor b	etween	SAP table default	0 (!)			
Extornal wall	E8: Balaany within a dw	als)	SAR table default	0.1	Dofault		
	wall insulation continuo	vennig - Lis		0.1	Delault		
External wall	F17: Corner (inverted -	internal	Calculated by person with suitable	-0.09	Knauf		
External wai	area greater than extern	nal area)	expertise	0.00			
0. A.'	· / · · · · · · · ·						
3 Air permeabili	ty (better than typically	/ expected	values are flagged with a subseque	lent (!))			
Dwolling of permit	eu air permeability at 50	ra	$\sigma III /IIII$		OK		
Air permeability t	est certificate reference		s m /nm , Design Value (!)		UK		
			l				
4 Space heating							
Main heating sy	stem 1: Heat pump with	radiators or	r underfloor heating - Electricity				
Efficiency		219.3%					
Emitter type		Underfloor					
Flow temperature)	45°C					
System type		Air source	heat pump				
Manufacturer							
Model							
Commissioning							
Secondary heat	Ing system: N/A	N1/A					
		IN/A					
		IN/A					
Commissioning							
5 Hot water							
Cylinder/store -	type: Cylinder						
Capacity		150 litres					
Declared heat los	SS	1.7 kWh/da	ay				
Primary pipework	c insulated	Yes					
Manufacturer							
Model							
Commissioning							
Waste water hea	at recovery system 1 - t	type: N/A					
Efficiency							
Manufacturer							
IVIODEI							
6 Controls							
Main heating 1 -	type: Time and tempera	ature zone c	ontrol by arrangement of plumbing a	and electrical servi	ces		
Function							
Ecodesign class							
Manufacturer							
Model							
Water heating -	Water heating - type: Cylinder thermostat and HW separately timed						
Manufacturer							
Model							
7 Lighting							
Minimum permitti	ed light source efficacy	75 lm/W					
Lowest light sour	ce efficacy	80 lm/W		0	К		
External lights co	ntrol	N/A					

8 Mechanical ventilation								
System type: Balanced whole-house me	chanical ventilation v	vith heat recovery						
Maximum permitted specific fan power	1.5 W/(I/s)							
Specific fan power	0.84 W/(l/s)		ОК					
Minimum permitted heat recovery	73%							
efficiency								
Heat recovery efficiency	89%		ОК					
Manufacturer/Model	HRV1 Q Plus							
Commissioning								
9 Local generation								
Technology type: Photovoltaic system	(1)							
Peak nower	0.8 kWn							
Orientation	South							
Pitch	30°							
Overshading	None or very little							
Manufacturer								
MCS certificate								
10 Heat networks								
N/A								
11 Supporting documentary evidence								
N/A								
10 Declarations								
12 Declarations								
a. Assessor Declaration		stasta of this DDEL Consuliance Depart						
I his declaration by the assessor is co	ntirmation that the co	This declaration by the assessor is confirmation that the contents of this BREL Compliance Report						
are a true and accurate reflection bas	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								
the purpose of carrying out the "As de	ed upon the design in signed" assessment,	formation submitted for this dwelling for and that the supporting documentary						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi	ed upon the design in signed" assessment, x 1 (documentary evi	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has	ed upon the design in signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report.	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report.	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report.	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report. Signed:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID:						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report. Signed:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID:						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has l Compliance Report. Signed:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID:						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has I Compliance Report. Signed: Name:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID: Date:						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report. Signed: Name:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID: Date:						
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has l Compliance Report. Signed: Name: b. Client Declaration	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID: Date:						



Property Reference		Flat 12									Issu	ied on Date	05/	07/202	3
Assessment Reference		000012						Prop	o Type I	Ref	Flat				
Property		Flat 12,	Luton	, Bedfords	hire, LU1	ЗНХ									
SAP Rating					87 B		DFR		2.86			TER	[12 22	
Environmental							% DFR	< TFR	2.00	,		TER		76.60	
CO. Emissions (t/year)					0.25		DEEE		31.9	25		TEEE		23 77	
Compliance Check					See BE		% DFF	F < TFFI	=					5 69	
% DPER < TPER					51.29		DPER		31.9	6		TPER		65.61	
										-		A		D7 00	
Assessor Details	Mr.	Darren C	oham									Assesso	שוי	R789-	0001
			Nov	, Ruild (Λε Ποεί	ianod)									
		ATON.	Nev	/ Dulla (/		igneu)									
Orientation					Southe	ast									
Property lenture					ND										
Transaction Type					6										
ierrain lype					Urban										
1.0 Property Type					Flat, Er	nd-Terrace									
Position of Flat					Mid-floo	or flat									
Which Floor					5										
2.0 Number of Storeys					2										
3.0 Date Built					2023										
4.0 Sheltered Sides					2										
5.0 Sunlight/Shade					Averag	e or unknown									
6.0 Thermal Mass Parame	eter				Precise	calculation									
Thermal Mass					N/A							kJ/m²K			
7.0 Electricity Tariff					Standa	rd									
Smart electricity meter	fitted				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	Heat it: y: y: y: y: y: y: y: y: y:	Loss Pe 0.00 n 16.75 r 21.70 r 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n	erimete n n 1 1 1 1 1 1 1 1 1	r In	1ternal 1 0.0 49.7 47.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Floor Area 0 m ² 18 m ² 50 m ² 0 m ² 0 m ² 0 m ² 0 m ² 0 m ²	Avera	ge Stc 0.00 2.70 2.70 0.00 0.00 0.00 0.00 0.00	rey Height m m m m m m m m m m m
8.0 Living Area					34.39							m²			
9.0 External Walls	_								_						
Description	Туре	-"	Constr	uction			U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openi	ngs Ar	a Calculation Type
External Wall 1	Cavity Wa	all i	Cavity N filled ca Cavity N filled ca	y wall : plasterboard on da cavity, any outside structu y wall : plasterboard on da cavity, any outside structu		e e os, AAC block, e	0.18	60.00	64.94 38.88	41.18 36.78	0.00	None Stairwell Acc Corridor	23.7 cess 2.1 4	o Cali D En	ter Gross Area
9.1 Party Walls															
Description	Тур	be		Construe	ction					U-Value	e Kapp	a Area	Shelter	:	Shelter
Party Wall 1	Fill Ede	ed Cavity ge Sealin	with g	Plasterbo sides, AA	ard on da C blocks	abs mounted (, cavity	on cemen	t render	on both	0.00	45.0	0 35.50	Res 0.00		None
9.2 Internal Walls Description		-	-	Construct	ion	-							K	appa	Area (m²
Internal Wall 1				Plasterboa	rd on tim	ber frame							(К.	9.00	125.44
10.1 Party Ceilings															



Des	cription		Const	ructio	on						Карра	Area (m²)
Part	y Ceiling 1		Precas	st con	crete plank floor (screed	laid on insulati	on), carpet	ed			(kJ/m²K) 30.00	47.50
10.2 Int Des Inter	ernal Ceilings cription rnal Ceiling 1		Storey Lowest occu	pied	Construction Plasterboard ceiling, c	arpeted chipbo	oard floor				Are 4	e a (m²) 9.18
11.1 Par Des	rty Floors cription		Storey Index	Con	struction	screed laid on	insulation	carneted	I		Kappa (kJ/m²K)	Area (m²)
			occupied	1100			insulation	, carpeteo			50.00	43.10
11.2 Inte Des	ernal Floors cription rnal Floor 1		Storey Index	Con Plas	struction terboard ceiling, carpeted	l chipboard flo	or				Kappa (kJ/m²K) 9.00	Area (m²) 47.50
12.0 Op Des	ening Types cription	Data Source	Туре		Glazing		Glazing	Filling	G-value	Frame	Frame	U Value
Entr Wine	ance Doors dows	Manufacturer Manufacturer	Solid Doo Window	r	Double Low-E Sof	t 0.05	Gap	Air Filled Air Filled	0.00 0.63	Wood Wood	0.70 0.75	1.00 1.20
13.0 Op Nan pd1 w1 ed1	nenings ne	Opening T Windows Windows Entrance D	ype oors		Location External Wall 1 External Wall 1 Sheltered Wall		Orienta North \ North \ South	ation West West East	Area 10.8 12.9 2.1	(m²) 30 96 0	Pi	tch 0 0 0
14.0 Co	nservatory				None							
15.0 Dra 16.0 Dra	aught Proofing aught Lobby				100 No				%			
17.0 Th 17.1 Lis	ermal Bridging st of Bridges				Calculate Bridges							
Brid E1 5 E4 J E6 I E7 F E16 E18 P3 F (in b E8 E cont E17 evte	Ige Type Steel lintel with perfor Jamb ntermediate floor with Party floor between dr Corner (normal) Party wall between o Party wall between o Party wall - Intermedia Jocks of flats) Balcony within a dwel innous Corner (inverted – in rnal area)	ated steel base nin a dwelling wellings (in block dwellings ate floor between ling, wall insulat ternal area grea	plate ks of flats) n dwellings ion ter than	Sou Inde Inde Inde Inde Inde Tabl Tabl	rce Type pendently assessed pendently assessed pendently assessed pendently assessed pendently assessed pendently assessed e K1 - Default e K1 - Default pendently assessed	Length 10.92 23.30 21.70 16.75 16.20 10.80 22.80 4.70 5.40	Psi 0.07 0.02 0.00 0.07 0.05 0.07 0.00 0.10 -0.09	Adjusted 0.07 0.02 0.00 0.07 0.05 0.07 0.00 0.10 -0.09	Reference Thermally B Knauf Knauf Knauf Knauf Default Knauf	: Broken		Imported Yes Yes Yes No Yes No No No
Y-va	alue				0.04				W/m²K			
Des	cription				Arch							
18.0 Pro Des Prop	essure Testing igned AP ₅₀ perty Tested?				Yes 3.00 Yes				m³/(h.m	¹²) @ 50 P	a	
Test	Method				Blower Door							
As E	Built AP₅₀				0.10				m³/(h.m	²) @ 50 P	a	
19.0 Me	chanical Ventilation	1										
Mee	Mechanical Ventilat	ion System Pres	sent		Yes							
	Approved Installation	on			No							
	Mechanical Ventilat	ion data Type			Database							
	Туре				Balanced mechanical ve	ntilation with h	eat recove	ry				
	MV Reference Num	nber			500082							
	Configuration			i	2							
	Manufacturer SFP			i	0.84				7			
	Duct Type				Rigid				Ξ			
	MVHR Efficiency			İ	89.00							



		1
Wet Rooms	2	
SFP from Installer Commissioning Certificate	No	
MVHR System Location	Inside heated envelope (installed exclusively)	
Duct Installation Specification	Level 1]
20.0 Fans, Open Fireplaces, Flues		
21.0 Fixed Cooling System	No]
22.0 Lighting		
No Fixed Lighting	No]
	NameEfficacyPowerLighting 180.006	CapacityCount48010
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 thin screed]
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 II		
Heat source 1 None Heat source 2 None	Heat Power Ratio	
Heat source 3 None Heat source 4 None Heat source 5 None		
28.0 Water Heating	Main Heating 1	l
SAP Code]
Flue Gas Heat Recovery System	No]
Waste Water Heat Recovery Instantaneous System 1	No]
]
Waste Water Heat Recovery Instantaneous System 2	No]
Solar Panel]
Water use z= 125 litres/serses/dev]
water use <- 120 iltres/person/day]
]
Cold Water Source]
Dath Count	1]



Supplementary Immersion			No						
Immersion Only Heating Hot	Water		No						
28.3 Waste Water Heat Recover	ry System								
29.0 Hot Water Cylinder			Hot Water Cylinde	r					
Cylinder Stat			Yes						
Cylinder In Heated Space			Yes						
Independent Time Control			Yes						
Insulation Type			Measured Loss						
Cylinder Volume			150.00				L		
Loss			1.70				kWh/da	y	
Pipes insulation			Fully insulated prin	nary pipework					
In Airing Cupboard			No						
31.0 Thermal Store			None						
32.0 Photovoltaic Unit			Multiple Dwellings	- Connected					
Export Capable Meter?			Yes						
Connected To Dwelling			Yes						
Diverter			No						
Battery Capacity [kWh]			0.00						
PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Over: Facto	shading or	MCS Certificate	Panel Manufacturer
0.80	South	30°	None Or Little	No	No	1.00		Reference	
34.0 Small-scale Hydro			None						
Electricity Generated			0.00						
Apportioned			0.00				kWh/Ye	ar	
Connected to dwelling's elect	ricity meter		Yes						
Electricity Generation			Annual						
Jan Feb	Mar	Apr	May Jun	Jul	Aug	Sep	Oct	t Nov	Dec

Recommendations Lower cost measures

None

Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 12, Luton, Bedfordshire, LU1 3HX

Dwelling type: Date of assessment: Produced by: Total floor area: DRRN: Flat, End-Terrace 05/07/2023 Darren Coham <u>9</u>6.68 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.



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. 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.

Thermal Bridging



Property Ref	ference		Flat 12	Flat 12				lss	ued on Da	ite 05	5/07/2023	
Assessment	Reference		000012			Prop T	ype Ref	End-	Terrace Fla	at		
Property Flat 12, Luton, Bedfordshire, LU1 3HX												
SAP Rating				87 B	DER		2.86		TER		12.22	
Environmen	tal			98 A	% DER ·	< TER					76.60	
CO ₂ Emissio	ns (t/year)			0.25	DFEE		31.85		TFEE		33.77	
Compliance	Check			See BREL	% DFEE	< TFEE					5.69	
% DPER < T	PER			51.29	DPER		31.96		TPER		65.61	
Assessor De	etails	Mr.	Darren Coham						Assess	or ID	R789-0001	
Client												
	Junction	deta	ails		Sourc	е Туре	Psi (W/mk	() I	Length (m)	Result	Reference	
External wall	E1 Steel li	ntel	with perforated steel	base plate	Indepe asse	endently essed	0.068		10.92	0.74	Thermally Broken	
External wall	E4 Jamb				Indepe asse	endently essed	0.018		23.30	0.42	Knauf	
External wall	E6 Interme	edia	te floor within a dwelli	ing	Indepe asse	endently essed	0.002		21.70	0.04	Knauf	
External wall	E7 Party fl	loor	between dwellings (ir	n blocks of flats)	Indepe asse	endently essed	0.065		16.75	1.09	Knauf	
External wall	E16 Corne	er (n	ormal)		Indepe asse	endently essed	0.048		16.20	0.78	Knauf	
External wall	E18 Party wall between dwellings			Indepe asse	endently essed	0.069		10.80	0.75	Knauf		
Party wall	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)			Table K1	- Defau	lt 0.000		22.80	0.00			
External wall	E8 Balcon continuous	y w s	thin a dwelling, wall ir	nsulation	Table K1	- Defau	lt 0.100		4.70	0.47	Default	
External wall	E17 Corne external a	er (ir rea)	nverted – internal area	a greater than	Indepe asse	endently essed	-0.090)	5.40	-0.49	Knauf	

Total: 132.57 W/mK: Y-Value: 0.04 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 11:45:16

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	96 m ²
Site Reference	Flat 13	Plot Reference	000013
Address	Flat 13, 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	11.91 kgCO ₂ /m ²					
Dwelling carbon dioxide emission rate	2.75 kgCO ₂ /m ²	ОК				
1b Target primary energy rate and dwelling primary energy						
Target primary energy	63.94 kWh _{PE} /m ²					
Dwelling primary energy	30.88 kWh _{PE} /m ²	ОК				
1c Target fabric energy efficiency and dwelling fabric energy efficiency						
Target fabric energy efficiency	32.3 kWh/m ²					
Dwelling fabric energy efficiency	31.5 kWh/m ²	ОК				

2a Fabric U-values								
Element	Maximum permitted	Dwelling average U-Value	Element with highest					
	average U-Value [W/m ² K]	[W/m ² K]	individual U-Value					
External walls	0.26	0.18	Walls (1) (0.18)	ОК				
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)	53.98	0.18					
Sheltered wall: Walls (2)	7.2449	0.18					
Party wall: Party Wall (1)	20.36	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 West	N/A	1 (!)				
w3, Windows	3.24	North East	0.75	1.2				
pd2. Windows	5.4	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				

Main element	Junction detail		Source	Psi value [W/mK]	Drawing /			
			expertise					
External wall	E7: Party floor between	dwellings	Calculated by person with suitable	0.065	Knauf			
	(in blocks of flats)	0	expertise					
External wall	E16: Corner (normal)		Calculated by person with suitable expertise	0.048	Knauf			
External wall	E18: Party wall between	n dwellings	Calculated by person with suitable expertise	0.069	Knauf			
Party wall	P3: Intermediate floor b dwellings (in blocks of f	etween lats)	SAP table default	0 (!)	Default			
External wall	E8: Balcony within a dw	velling -	SAP table default	0.1	Default			
External wall	E17: Corner (inverted - area greater than extern	internal nal area)	Calculated by person with suitable expertise	-0.09	Knauf			
0. A :				· · · · · · (1))				
3 Air permeabili	ty (better than typically		values are flagged with a subsequence $\frac{1}{2}$ m ³ /hm ²	lent (!))				
Dwelling air permit	<i>led all permeability at 50</i> peability at 50Pa	Pa	$3 \text{ m}^3/\text{hm}^2$ Design value (1)		OK			
Air permeability to	est certificate reference							
4 Space heating	· · · · · · · · · · · · · · · · · · ·							
Main heating sy	stem 1: Heat pump with	radiators or	r underfloor heating - Electricity					
Efficiency		219.3%						
Ellow temperature								
System type Air			heat nump					
Manufacturer								
Model								
Commissioning								
Secondary heat	ing system: N/A							
Fuel		N/A						
Efficiency		N/A						
Commissioning								
5 Hot water								
Cylinder/store -	type: Cylinder							
Capacity	<u>.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	150 litres						
Declared heat los	SS	1.7 kWh/da	kWh/day					
Primary pipework	c insulated	Yes	·					
Manufacturer								
Model								
Commissioning								
Waste water hea	at recovery system 1 - t	ype: N/A						
Efficiency								
Manufacturer								
6 Controls	· -							
Iviain neating 1 -	type: Time and tempera	iture zone c	ontrol by arrangement of plumbing a	and electrical se	ervices			
Manuacturer								
Water heating -	type: Cylinder thermosta	t and HW o	eparately timed					
Manufacturer								
Model								
	I							
7 Lighting	ad liabh anns - tti	75 100 141						
Iviinimum permitte	ea light source efficacy	75 IM/VV			OK			
Evternal light sour								
		1 11/7 1						

8 Mechanical ventilation								
System type: Balanced whole-house me	chanical ventilation v	with heat recovery						
Maximum permitted specific fan power	1.5 W/(I/s)							
Specific fan power	0.73 W/(l/s)		ОК					
Minimum permitted heat recovery	73%							
efficiency								
Heat recovery efficiency	90%		ОК					
Manufacturer/Model	HRV1 Q Plus							
Commissioning								
9 Local generation								
Technology type: Photovoltaic system	(1)							
Peak nower	0.8 kWp							
Orientation	South							
Pitch	30°							
Overshading	Vershading None or very little							
MCS certificate								
NOO certificate								
10 Heat networks	10 Heat networks							
N/A								
11 Supporting documentary evidence								
N/A								
12 Declarations								
a. Assessor Declaration			1					
This declaration by the assessor is co	nfirmation that the co	intents of this BREL Compliance Report						
are a true and accurate reflection bas	ed upon the design ir	formation submitted for this dwelling for						
the purpose of carrying out the "As de	signed" assessment,	and that the supporting documentary						
evidence (SAP Conventions, Appendi	evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum							
documentary evidence required) has been reviewed in the course of preparing this BREL								
documentary evidence required) has l	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL						
Compliance Report.	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL						
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Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL						
Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID:						
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Compliance Report. Signed: Name:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:						
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Compliance Report. Signed: Name:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:						



Property Reference		Flat 13									Issu	ued on Date	05	5/07/202	23
Assessment Reference		000013						Prop	o Type i	Ref	Flat				
Property		Flat 13,	Luton	, Bedfordsl	nire, LU1	3HX									
SAP Pating							DEP		0.75			TEP		11.04	
SAP Rating					88 B				2.75)		IER		11.91	
					98 A			I TER	04.5	. 4		TEEE		76.91	
					0.24			E ~ TEE	31.5	94		IFEE		32.29	
					51 70	KEL		E < IFE	30.8	9		TPER		2.29	
					51.70		DIEK		30.0	0				03.94	
Assessor Details	Mr.	Darren C	oham									Assesso	r ID	R789-	0001
Client															
SUMMARY FOR INPL	JT DAT	A FOR:	New	/ Build (/	As Desi	igned)									
Orientation					Southw	/est									
Property Tenture					ND										
Transaction Type					6										
Terrain Type	rain Type			Urban	Urban										
1.0 Property Type					Flat, Er	nd-Terrace									
Position of Flat					Mid-flo	or flat									
Which Floor					5										
2.0 Number of Storeys					1										
3.0 Date Built					2023										
4.0 Sheltered Sides					2										
5.0 Sunlight/Shade					Averag	e or unknown									
6.0 Thermal Mass Parame	eter				Precise	e calculation									
Thermal Mass					N/A							kJ/m²K			
7.0 Electricity Tariff					Standa	rd									
Smart electricity meter	fitted				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	Heat t: y: y: y: y: y: y: y: y:	: Loss Pe 0.00 n 32.92 r 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n 0.00 n	erimete n n n n n n n n	r In	ternal f 0.0 96.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Floor Area 0 m ² 00 m ² 0 m ²	Aver	age Sto 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00	orey Height I I I I I I I I I I I I I I I I I I I
8.0 Living Area					28.73							m²			
9.0 External Walls	-		• •							N-41 -	ol:				
Description	Cavity M	all	Covin		oard on d-	he AAC block	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	(m ²)	Res	Shelter	Oper	56 Cel	Type
Sheltered Wall	Cavity W	all	filled ca Cavity v filled ca	vity, any outs vall : plasterb vity, any outs	ide structur oard on dal ide structur	e bs, AAC block, e	0.18	60.00	9.34 9.34	7.24	0.90	Stairwell Ac Corridor	25. cess 2. 4	10 Er	ter Gross Area
9.1 Party Walls															
Description	Туј	pe		Construc	tion					U-Value (W/m²K)	e Kapp) (k.l/m²	a Area ²K) (m²)	Shelter Res	•	Shelter
Party Wall 1	Fill Ed	ed Cavity ge Sealin	v with Ig	Plasterbo sides, AA	ard on da C blocks	abs mounted , cavity	on cemer	nt render	on both	0.00	45.0	0 20.36	0.00		None
9.2 Internal Walls Description				Construct	ion								 /L	Kappa	Area (m²
Internal Wall 1				Plasterboa	rd on tim	ber frame							("	9.00	234.00
10.1 Party Ceilings															



Description		Const	ructio	on Snata plank floor (oorood k	aid on inculat	ion) corno	tod			Kappa (kJ/m²K)	Area (m²)
		Piecas	St CON	crete plank libbi (screed la		ion), carpe	leu			30.00	96.00
11.1 Party Floors		Storov	Con	struction						Kanna	Aroa (m2)
Description		Index	Con	struction						(kJ/m²K)	Area (III-)
Party Floor 1		Lowest occupied	Prec	ast concrete plank floor (s	screed laid or	n insulation), carpetec			30.00	96.00
12.0 Opening Types											
Description	Data Source	Туре		Glazing		Glazing Gan	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
Entrance Doors Windows	Manufacturer Manufacturer	Solid Doo Window	r	Double Low-E Soft	0.05	Cup	Air Filled Air Filled	0.00 0.63	Wood Wood	0.70 0.75	1.00 1.20
13.0 Openings											
Name	Opening Ty Windows	ре		Location External Wall 1		Orient North	ation West	Area	(m²)	Pi	tch
w1	Windows			External Wall 1		North	West	6.4	48		0
w2 ed1	Windows Entrance Do	ors		External Wall 1 Sheltered Wall		North South	East West	5.0	04 10		0
w3	Windows			External Wall 1		North	East	3.2	24		0
puz	Windows					South	East		+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			_	_							
Bridge Type E1 Steel lintel with per	forated steel base p	late	Sou Inde	rce Type pendently assessed	Length 11.67	Psi 0.07	Adjusted 0.07	I Reference Thermallv	e: Broken		Imported Yes
E4 Jamb	, ,	f flata)	Inde	pendently assessed	28.10	0.02	0.02	Knauf			Yes
E16 Corner (normal)	a dwellings (in blocks	s of flats)	Inde	pendently assessed	65.84 8.10	0.07	0.07	Knauf			No
E18 Party wall betwee	en dwellings	dwellings	Inde	pendently assessed	5.40 15.08	0.07	0.07	Knauf Default			Yes
(in blocks of flats)		uwenings	Iabi	e RT - Delault	15.00	0.00	0.00	Delault			NO
E8 Balcony within a dv continuous	welling, wall insulation	on	Tabl	e K1 - Default	11.80	0.10	0.10	Default			No
E17 Corner (inverted - external area)	- internal area greate	er than	Inde	pendently assessed	2.70	-0.09	-0.09	Knauf			No
Y-value				0.08				W/m²K	[
Description				Arch							
18.0 Pressure Testing				Yes							
Designed AP ₅₀				3.00				m³/(h.r	n²) @ 50 F	Pa	
Property Tested?				Yes							
Test Method				Blower Door							
As Built AP ₅₀				0.10				m³/(h.r	m²) @ 50 F	Pa	
19.0 Mechanical Ventilat	ion										
Mechanical Ventilation	on										
Mechanical Vent	ilation System Prese	ent		Yes							
Approved Installa	ation			No							
Mechanical Vent	ilation data Type			Database							
Туре				Balanced mechanical ver	ntilation with h	neat recove	ery				
MV Reference N	lumber			500082							
Configuration				1							
Manufacturer SF	P			0.73							
Duct Type				Rigid							
MVHR Efficiency	/			90.00							
Wet Rooms				1				–			
SFP from Installe	er Commissioning C	ertificate		No				Ξ.			
M\/UP System I	ocation			Inside heated envelope (i	netalled evalu	usively)		=			
	Specification					uorvory)					
Duct installation	opecification										



20.0 Fans, Open Fireplaces, Flues

21.0 Fixed Cooling System	No					
22.0 Lighting						
No Fixed Lighting	No					
	Name Lighting 1	Efficacy 80.00	Power 6	Ca	pacity 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	Underfloor					
Underfloor Heating	Yes - Pipes in th	hin screed				
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 U	se Efficiency	y Percentage Of Heat	Heat Heat Power	Electrical	Fuel Factor	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					
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					
				í		
20.3 waste water neat Recovery System						
29.0 Hot Water Cylinder	Hot Water Cylin	nder				



Jan	Feb	Mar	Apr	May J	un	Jul	Aug	Sep	Oct	t Nov	Dec
Electricity Ger	neration			Annual							
Connected to	dwelling's elect	tricity meter		Yes							
Apportioned				0.00					kWh/Ye	ear	
Electricity Ger	nerated			0.00							
34.0 Small-scale	Hydro			None							
0.80		South	30°	None Or L	ittle No	0	No	1.00		Relefence	
PV Cell	s kWp	Orientation	Elevation	Overshad	ing FC	GHRS	MCS Certificate	Over Facto	shading or	MCS Certificate	Panel Manufacturer
Battery Capac	city [kWh]			0.00							
Diverter				No							
Connected To	Dwelling			Yes							
Export Capab	le Meter?			Yes							
32.0 Photovoltai	c Unit			Multiple Dwelli	ngs – C	onnected					
31.0 Thermal Sto	ore			None							
In Airing Cupt	oard			No							
Pipes insulation	on			Fully insulated	primary	v pipework					
Loss				1.70					kWh/da	iy	
Cylinder Volu	ne			150.00					L		
Insulation Typ	e			Measured Los	3						
Independent -	Fime Control			Yes							
Cylinder In He	eated Space			Yes							
Cylinder Stat				Yes							

Recommendations Lower cost measures

None Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 13, Luton, Bedfordshire, LU1 3HX

Dwelling type: Date of assessment: Produced by: Total floor area: DRRN: Flat, End-Terrace 05/07/2023 Darren Coham <u>9</u>6 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.



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. 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.

Thermal Bridging



Property Ref	ference		Flat 13					Issued on Date			05/07/2023	
Assessment	Reference		000013		Prop	Туре	Ref	End-	Terrace Fla	at		
Property			Flat 13, Luton, Bedfords	hire, LU1 3HX								
SAP Rating				88 B	DER	2.7	5		TER		11.91	
Environmental 98 A					% DER < TER		-				76.91	
CO ₂ Emissio	ns (t/year)			0.24	DFEE	31.	54		TFEE		32.29	
Compliance Check See BREL				See BREL	% DFEE < TFEE						2.29	
% DPER < TPER				51.70	DPER	30.	88		TPER		63.94	
Assessor De	etails	Mr.	Darren Coham						Assess	sor ID	R789-0001	
Client												
	Junction details				Source Type		Psi (W/mK)	L	.ength (m)	Result	Reference	
External wall	E1 Steel li	intel	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 f	loor	between dwellings (ii	n blocks of flats)	Independently assessed	'	0.065		65.84	4.28	Knauf	
External wall	E16 Corne	er (r	ormal)		Independently assessed	'	0.048		8.10	0.39	Knauf	
External wall	E18 Party	wa	l between dwellings		Independently assessed	'	0.069		5.40	0.37	Knauf	
Party wall	P3 Party v dwellings	vall (in t	 Intermediate floor be blocks of flats) 	etween	Table K1 - Defa	ult	0.000		15.08	0.00	Default	
External wall	E8 Balcon continuou	iy w s	ithin a dwelling, wall i	nsulation	Table K1 - Defa	Table K1 - Default 0.100			11.80 1.18		Default	
External wall	E17 Corne external a	er (i rea)	nverted – internal area	a greater than	Independently assessed	'	-0.090		2.70	-0.24	Knauf	

Total: 148.69 W/mK: Y-Value: 0.08 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 11:45:16

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	96 m ²
Site Reference	Flat 14	Plot Reference	000014
Address	Flat 14, 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	11.91 kgCO ₂ /m ²								
Dwelling carbon dioxide emission rate	2.75 kgCO ₂ /m ²	ОК							
1b Target primary energy rate and dwelling primary energy									
Target primary energy	63.94 kWh _{PE} /m ²								
Dwelling primary energy	30.88 kWh _{PE} /m ² OK								
1c Target fabric energy efficiency and dwelling fabric ene	rgy efficiency								
Target fabric energy efficiency	32.3 kWh/m ²								
Dwelling fabric energy efficiency	31.5 kWh/m ²	ОК							

2a Fabric U-values										
Element	Maximum permitted	Dwelling average U-Value	Element with highest							
	average U-Value [W/m ² K]	[W/m ² K]	individual U-Value							
External walls	0.26	0.18	Walls (1) (0.18)	ОК						
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)	53.98	0.18								
Sheltered wall: Walls (2)	7.2449	0.18								
Party wall: Party Wall (1)	20.36	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 West	N/A	1 (!)							
w3, Windows	3.24	North East	0.75	1.2							
pd2. Windows	5.4	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	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							

Main element	Junction detail		Source	Psi value [W/mK]	Drawing /					
			expertise							
External wall	E7: Party floor between	dwellings	Calculated by person with suitable	0.065	Knauf					
	(in blocks of flats)	0	expertise							
External wall	E16: Corner (normal)		Calculated by person with suitable expertise	0.048	Knauf					
External wall	E18: Party wall between	n dwellings	Calculated by person with suitable expertise	0.069	Knauf					
Party wall	P3: Intermediate floor b dwellings (in blocks of f	etween lats)	SAP table default	0 (!)	Default					
External wall	E8: Balcony within a dw	velling -	SAP table default	0.1	Default					
External wall	E17: Corner (inverted - area greater than extern	internal nal area)	Calculated by person with suitable expertise	-0.09	Knauf					
0. A :				· · · · · · (1))						
3 Air permeabili	ty (better than typically		values are flagged with a subsequence $\frac{1}{2}$ m ³ /hm ²	lent (!))						
Dwelling air permit	<i>led all permeability at 50</i> peability at 50Pa	Pa	$3 \text{ m}^3/\text{hm}^2$ Design value (1)		OK					
Air permeability to	est certificate reference									
4 Space heating	· · · · · · · · · · · · · · · · · · ·									
Main heating sy	stem 1: Heat pump with	radiators or	r underfloor heating - Electricity							
Efficiency		219.3%								
Ellow temperature										
System type	,	Air source l	heat nump							
Manufacturer										
Model										
Commissioning										
Secondary heat	ing system: N/A									
Fuel		N/A								
Efficiency		N/A								
Commissioning										
5 Hot water										
Cylinder/store -	type: Cylinder									
Capacity	<u>.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	150 litres								
Declared heat los	SS	1.7 kWh/da	 ay							
Primary pipework	c insulated	Yes	/							
Manufacturer										
Model										
Commissioning										
Waste water hea	at recovery system 1 - t	ype: N/A								
Efficiency										
Manufacturer										
6 Controls	· -									
Iviain neating 1 -	type: Time and tempera	iture zone c	ontrol by arrangement of plumbing a	and electrical se	ervices					
Model										
Water heating -	type: Cylinder thermosta	t and HW o	eparately timed							
Manufacturer										
Model										
	I									
7 Lighting	ad liabh anns - tti	75 100 141								
Iviinimum permitte	ea light source efficacy	75 IM/VV								
Evternal light sour			ОК							
		1 11/7 1								

8 Mechanical ventilation										
System type: Balanced whole-house me	System type: Balanced whole-house mechanical ventilation with heat recovery									
Maximum permitted specific fan power	1.5 W/(I/s)									
Specific fan power	0.73 W/(l/s)		ОК							
Minimum permitted heat recovery	73%									
efficiency										
Heat recovery efficiency	90%		ОК							
Manufacturer/Model	HRV1 Q Plus									
Commissioning										
9 Local generation										
Technology type: Photovoltaic system	(1)									
Peak nower	0.8 kWp									
Orientation	South									
Pitch	30°									
Overshading	None or very little									
Manufacturer										
MCS certificate										
NOO certificate										
10 Heat networks										
N/A										
11 Supporting documentary evidence										
N/A										
12 Declarations										
a. Assessor Declaration			1							
This declaration by the assessor is co	nfirmation that the co	intents of this BREL Compliance Report								
are a true and accurate reflection bas	ed upon the design ir	formation submitted for this dwelling for								
the purpose of carrying out the "As de	signed" assessment,	and that the supporting documentary								
evidence (SAP Conventions, Appendi	and purpose of carrying out the As designed assessment, and that the supporting documentary									
documentary evidence required) has been reviewed in the course of preparing this BREI										
documentary evidence required) has l	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL								
Compliance Report.	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL								
Compliance Report.	x 1 (documentary evi been reviewed in the	dence) schedules the minimum course of preparing this BREL								
Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL								
Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID:								
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Compliance Report.	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID:								
Compliance Report. Signed: Name:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:								
Compliance Report. Signed:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:								
Compliance Report. Signed: Name:	x 1 (documentary evi	dence) schedules the minimum course of preparing this BREL Assessor ID: Date:								



Property Reference		Flat 14									Issu	ued on Date	05/0)7/202	3
Assessment Reference		000014						Prop	o Type I	Ref	Flat				
Property		Flat 14,	Luton	, Bedfordsl	nire, LU1	3HX									
							DED		0.75			TED			
SAP Rating					88 B				2.75)		IER		11.91	
Environmental					98 A		% DER	< IER	04.5			TEEE		6.91	
CO ₂ Emissions (t/year)					0.24		DFEE 31.54			IFEE		32.29			
					See Br	KEL			-	0		TDED		2.29	
/ DPER > IPER					51.70		DPER		30.8	8		IPER		03.94	
Assessor Details	Mr.	Darren C	oham									Assesso	r ID	R789-0	0001
Client															
SUMMARY FOR INPL	JT DAT	A FOR:	Nev	v Build (<i>i</i>	As Desi	igned)									
Orientation					Southw	vest									
Property Tenture					ND										
Transaction Type					6										
Terrain Type					Urban										
1.0 Property Type					Flat, Er	nd-Terrace									
Position of Flat					Mid-floo	or flat									
Which Floor					7										
2.0 Number of Storeys					1										
3.0 Date Built					2023										
4.0 Sheltered Sides	4.0 Sheltered Sides				2										
5.0 Sunlight/Shade	5.0 Sunlight/Shade				Average or unknown										
6.0 Thermal Mass Parame	eter				Precise	calculation									
Thermal Mass					N/A							kJ/m²K			
7.0 Electricity Tariff					Standa	rd									
Smart electricity meter	fitted				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	Heat t: /: /: /: /: /: /: /: /:	Loss Pe 0.00 m 32.92 r 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m	erimete 1 1 1 1 1 1 1 1 1 1 1 1	r In	Iternal I 0.0 96.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Floor Area 0 m ² 00 m ² 0 m ²	Avera	ge Sto 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00	rey Height
8.0 Living Area					28.73							m²			
9.0 External Walls	τ.		0 - ·					к.	•	N-41 -	01	<u> </u>			
Description			Constr		oard on d-	AAC block	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openir	ngs Are	a Calculation Type
Sheltered Wall	Cavity W	all	filled ca Cavity v filled ca	waii : plasterb wity, any outs wall : plasterb wity, any outs	ide structur oard on dal ide structur	e os, AAC block, e	0.18	60.00	9.34	7.24	0.90	Stairwell Aco Corridor	25.5 cess 2.10 4	En En	ter Gross Area
9.1 Party Walls															
Description	Туј	ре		Construc	tion					U-Value (W/m ² K)	k.l/m ²	a Area ²K) (m²)	Shelter Res	5	Shelter
Party Wall 1	Fill Ed	ed Cavity ge Sealin	y with g	Plasterbo sides, AA	ard on da C blocks	abs mounted o , cavity	on cemen	t render	on both	0.00	45.0	0 20.36	0.00		None
9.2 Internal Walls Description				Construct	ion								K	appa /m²K\	Area (m²
Internal Wall 1				Plasterboa	rd on tim	ber frame							(KJ).00	234.00
10.1 Party Ceilings															



Description		Const	ructio	on Snata plank floor (oorood k	aid on inculat	ion) corno	tod			Kappa (kJ/m²K)	Area (m²)
		Piecas	St CON	crete plank libbi (screed la		ion), carpe	leu			30.00	96.00
11.1 Party Floors		Storov	Con	struction						Kanna	Aroa (m2)
Description		Index	Con	struction						(kJ/m²K)	Area (III-)
Party Floor 1		Lowest occupied	Prec	ast concrete plank floor (screed laid or	n insulation), carpetec			30.00	96.00
12.0 Opening Types											
Description	Data Source	Туре		Glazing		Glazing Gan	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
Entrance Doors Windows	Manufacturer Manufacturer	Solid Doo Window	r	Double Low-E Soft	0.05	Cup	Air Filled Air Filled	0.00 0.63	Wood Wood	0.70 0.75	1.00 1.20
13.0 Openings											
Name	Opening Ty Windows	ре		Location External Wall 1		Orient North	ation West	Area	(m²)	Pi	tch
w1	Windows			External Wall 1		North	West	6.4	48		0
w2 ed1	Windows Entrance Do	ors		External Wall 1 Sheltered Wall		North South	East West	5.0	04 10		0
w3	Windows			External Wall 1		North	East	3.2	24		0
puz	Windows					South	East		+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			_	_							
Bridge Type E1 Steel lintel with per	forated steel base p	late	Sou Inde	rce Type pendently assessed	Length 11.67	Psi 0.07	Adjusted 0.07	I Reference Thermallv	e: Broken		Imported Yes
E4 Jamb	, ,	f flata)	Inde	pendently assessed	28.10	0.02	0.02	Knauf			Yes
E16 Corner (normal)	a dwellings (in blocks	s of flats)	Inde	pendently assessed	65.84 8.10	0.07	0.07	Knauf			No
E18 Party wall betwee	en dwellings	dwellings	Inde	pendently assessed	5.40 15.08	0.07	0.07	Knauf Default			Yes
(in blocks of flats)		uwenings	Iabi	e RT - Delault	15.00	0.00	0.00	Delault			NO
E8 Balcony within a dv continuous	welling, wall insulation	on	Tabl	e K1 - Default	11.80	0.10	0.10	Default			No
E17 Corner (inverted - external area)	- internal area greate	er than	Inde	pendently assessed	2.70	-0.09	-0.09	Knauf			No
Y-value				0.08				W/m²K	Ξ.		
Description				Arch							
18.0 Pressure Testing				Yes							
Designed AP ₅₀				3.00				m³/(h.r	n²) @ 50 F	Pa	
Property Tested?				Yes							
Test Method				Blower Door							
As Built AP ₅₀				0.10				m³/(h.r	m²) @ 50 F	Pa	
19.0 Mechanical Ventilat	ion										
Mechanical Ventilation	on										
Mechanical Vent	ilation System Prese	ent		Yes							
Approved Installa	ation			No							
Mechanical Vent	ilation data Type			Database							
Туре				Balanced mechanical ver	ntilation with h	neat recove	ery				
MV Reference N	lumber			500082							
Configuration				1							
Manufacturer SF	P			0.73							
Duct Type				Rigid							
MVHR Efficiency	/			90.00							
Wet Rooms				1				–			
SFP from Installe	er Commissioning C	ertificate		No				Ξ.			
M\/UP System I	ocation			Inside heated envelope (i	netalled evalu	usively)		=			
	Specification					uorvory)					
Duct installation	opecification										



20.0 Fans, Open Fireplaces, Flues

21.0 Fixed Cooling System	No								
22.0 Lighting									
No Fixed Lighting	No								
	Name Lighting 1	Efficacy 80.00	Power 6	Ca	pacity 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	Underfloor								
Underfloor Heating	Yes - Pipes in th	hin screed							
Flow Temperature	Enter value								
Flow Temperature Value	45.00								
Boiler Interlock	No	No							
25.0 Main Heating 2	None								
26.0 Heat Networks	None								
Heat Source Fuel Type Heating U	se Efficiency	y Percentage Of Heat	Heat Heat Power	Electrical	Fuel Factor	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								
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								
				í					
20.3 waste water neat Recovery System									
29.0 Hot Water Cylinder	Hot Water Cylin	nder							



Jan	Feb	Mar	Apr	May J	un	Jul	Aug	Sep	Oct	t Nov	Dec
Electricity Ger	neration			Annual							
Connected to	dwelling's elect	tricity meter		Yes							
Apportioned				0.00					kWh/Ye	ear	
Electricity Ger	nerated			0.00							
34.0 Small-scale	Hydro			None							
0.80		South	30°	None Or L	ittle No	0	No	1.00		Relefence	
PV Cell	s kWp	Orientation	Elevation	Overshad	ing FC	GHRS	MCS Certificate	Over Facto	shading or	MCS Certificate	Panel Manufacturer
Battery Capac	city [kWh]			0.00							
Diverter				No							
Connected To	Dwelling			Yes							
Export Capab	le Meter?			Yes							
32.0 Photovoltai	c Unit			Multiple Dwelli	ngs – C	onnected					
31.0 Thermal Sto	ore			None							
In Airing Cupt	oard			No							
Pipes insulation	on			Fully insulated	primary	v pipework					
Loss				1.70					kWh/da	iy	
Cylinder Volu	ne			150.00					L		
Insulation Typ	e			Measured Los	3						
Independent -	Fime Control			Yes							
Cylinder In He	eated Space			Yes							
Cylinder Stat				Yes							

Recommendations Lower cost measures

None Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 14, Luton, Bedfordshire, LU1 3HX

Dwelling type: Date of assessment: Produced by: Total floor area: DRRN: Flat, End-Terrace 05/07/2023 Darren Coham <u>9</u>6 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.



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. 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.

Thermal Bridging



Property Ref	erence		Flat 14					Issi	ued on Da	ate 05	05/07/2023	
Assessment	Reference		000014			Prop Туре	e Ref	End-	Terrace Fla	at		
Property			Flat 14, Luton, Bedfords	hire, LU1 3HX								
SAP Rating				88 B	DER	27	75		TER		11 91	
Environmental											76.01	
CO ₂ Emissio	ns (t/vear)			0.24	DEEE 31.54				TFEE		32.29	
Compliance	Check			See BREI	% DFEE <	TFEE	.04				2 29	
% DPER < T	PER			51 70	DPER	30	88		TPER		63.94	
				01110		00					00.01	
Assessor De	etails	Mr.	Darren Coham						Assess	sor ID	R789-0001	
Client												
	Junction	ails		Source	Туре	Psi (W/mK)	_ength (m)	Result	Reference		
External wall	E1 Steel li	ntel	with perforated steel	base plate	Independently assessed 0		0.068	+	11.67	0.79	Thermally Broken	
External wall	E4 Jamb				Independ assess	Independently assessed			28.10	0.51	Knauf	
External wall	E7 Party fl	oor	between dwellings (ii	n blocks of flats)	Independ assess	dently sed	0.065		65.84	4.28	Knauf	
External wall	E16 Corne	er (r	ormal)		Independ assess	dently sed	0.048		8.10	0.39	Knauf	
External wall	E18 Party	wa	l between dwellings		Independ assess	dently sed	0.069		5.40	0.37	Knauf	
Party wall	P3 Party v dwellings	vall (in k	 Intermediate floor be blocks of flats) 	etween	Table K1 -	Default	0.000		15.08 0.0		Default	
External wall	E8 Balcon continuous	y w S	ithin a dwelling, wall i	nsulation	Table K1 -	Default	0.100		11.80 1.1		Default	
External wall	E17 Corne external a	er (i rea)	nverted – internal are	a greater than	Independ	dently sed	-0.090		2.70	-0.24	Knauf	

Total: 148.69 W/mK: Y-Value: 0.08 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 11:45:16

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

Dwelling Details			
Assessment Type	As designed	Total Floor Area	116 m ²
Site Reference	Flat 15	Plot Reference	000015
Address	Flat 15, 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	13.06 kgCO ₂ /m ²								
Dwelling carbon dioxide emission rate	3.44 kgCO ₂ /m ²	ОК							
1b Target primary energy rate and dwelling primary energ	У								
Target primary energy	69.97 kWh _{PE} /m ²								
Dwelling primary energy	37.35 kWh _{PE} /m ²	ОК							
1c Target fabric energy efficiency and dwelling fabric ene	rgy efficiency								
Target fabric energy efficiency	41.7 kWh/m ²								
Dwelling fabric energy efficiency	41.4 kWh/m ²	ОК							

2a Fabric U-values	;			
Element	Maximum permitted	Dwelling average U-Value	Element with highest	
	average U-value [w/m K]		Individual O-value	
External walls	0.26	0.18	Walls (1) (0.18)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	N/A	N/A	N/A
Roofs	0.16	0.11	Roof (1) (0.11)	ОК
Windows, doors,	1.6	1.19	w1 (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)	62.9	0.18							
Sheltered wall: Walls (2)	19.3649	0.18							
Exposed roof: Roof (1)	116.04	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]							
w1, Windows	6.48	North West	0.75	1.2							
w1, Windows	6.48	North West	0.75	1.2							
ed1, Entrance Doors	2.0951	South West	N/A	1 (!)							
w3, Windows	5.04	North East	0.75	1.2							
w2, Windows	4.32	North West	0.75	1.2							
w4, Windows	3.24	North East	0.75	1.2							
w5, Windows	5.4	South East	0.75	1.2							
w6, Windows	3.48	South East	0.75	1.2							
w7, Windows	5.4	South West	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 [W/mK]	Drawing / reference			
External wall	E1: Steel lintel with per	forated	Calculated by person with suitable	0.068	Thermally			
External wall	E4: Jamb		Calculated by person with suitable	0.018 (!)	Knauf			
External wall	E7: Party floor between	dwellinas	expertise Calculated by person with suitable	0.065	Knauf			
	(in blocks of flats)		expertise	0.070				
External wall	E14: Flat roof		expertise	0.052	Knauf			
External wall	E16: Corner (normal)		Calculated by person with suitable expertise	0.048	Knauf			
External wall	E17: Corner (inverted -	internal	Calculated by person with suitable	-0.09	Knauf			
External wall	E8: Balcony within a dw	/elling -	SAP table default	0.1	Default			
	wall insulation continuo	us						
3 Air permeabili	ty (better than typically	v expected	values are flagged with a subsequ	uent (!))				
Maximum permit	ted air permeability at 50)Pa	8 m³/hm²					
Dwelling air perm	neability at 50Pa		3 m³/hm², Design value (!)		ОК			
Air permeability t	est certificate reference							
4 Space heating								
Main heating sy	stem 1: Heat pump with	radiators or	r underfloor heating - Electricity					
Efficiency		219.3%						
Emitter type		Underfloor						
Flow temperature	9	45°C						
System type		Air source	neat pump					
Manufacturer								
Niddel								
Commissioning	ing evetom: N/A							
Secondary near		Ν/Λ						
Efficiency								
Commissioning								
5 HOL Water	tupo: Culindor							
Conneity	type. Cylinder	150 litroo						
Declared heat log	20	1 7 kWb/dc	N/					
Deciared field los	cinculated		ay					
Manufacturer		165						
Model								
Commissioning								
Waste water hea	at recovery system 1 - 1	vpe: N/A						
Efficiency								
Manufacturer								
Model								
6 Controls								
Main heating 1 -	type: Time and tempera	ture zone c	ontrol by arrangement of plumbing a	nd electrical serv	ices			
Function			, , , , , , , , , , , , , , , , , , , ,					
Ecodesign class								
Manufacturer								
Model								
Water heating -	type: Cylinder thermosta	t and HW s	eparately timed					
Manufacturer								
Model								
7 Lighting								
Minimum permitt	ed light source efficacy	75 lm/W						
Lowest light sour	ce efficacy	80 lm/W		0	K			
External lights co	ntrol	N/A						

8 Mechanical ventilation											
System type: Balanced whole-house me	chanical ventilation v	vith heat recovery									
Maximum permitted specific fan power	1.5 W/(I/s)										
Specific fan power	0.84 W/(l/s)		ОК								
Minimum permitted heat recovery	73%										
efficiency											
Heat recovery efficiency	89%		ОК								
Manufacturer/Model	HRV1 Q Plus										
Commissioning											
9 Local generation											
Technology type: Photovoltaic system	(1)										
Peak nower	0.8 kWn										
Orientation	South										
Pitch	30°										
Overshading	None or very little										
Manufacturer											
MCS certificate											
10 Heat networks											
N/A											
11 Supporting documentary evidence											
N/A											
10 Declarations											
12 Declarations											
a. Assessor Declaration		stasta of this DDEL Consuliance Depart									
I his declaration by the assessor is co	ntirmation that the co	This declaration by the assessor is confirmation that the contents of this BREL Compliance Report									
are a true and accurate reflection bas	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											
the purpose of carrying out the "As de	ed upon the design in signed" assessment,	formation submitted for this dwelling for and that the supporting documentary									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi	ed upon the design in signed" assessment, x 1 (documentary evi	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has	ed upon the design in signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report.	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report.	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report.	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report. Signed:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID:									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report. Signed:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID:									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has l Compliance Report. Signed:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID:									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has I Compliance Report. Signed: Name:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID: Date:									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has Compliance Report. Signed: Name:	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID: Date:									
the purpose of carrying out the "As de evidence (SAP Conventions, Appendi documentary evidence required) has l Compliance Report. Signed: Name: b. Client Declaration	ed upon the design ir signed" assessment, x 1 (documentary evi been reviewed in the	formation submitted for this dwelling for and that the supporting documentary dence) schedules the minimum course of preparing this BREL Assessor ID: Date:									



Property Reference		Flat 15							ed on <u>Date</u>	05/0	7/2023	}			
Assessment Reference		000015 Prop Type Ref													
Property		Flat 15,	Luton	, Bedfordsl	nire, LU1	3HX									
							DED					TED			
SAP Rating					84 B		DER		3.44			IER	1	3.06	
Environmental					97 A		% DER	< IER		_			7	3.66	
CO ₂ Emissions (t/year)					0.37		DFEE		41.3	7		TFEE	4	1.68	
					See BF	REL	% DFE			_		7050	0	.76	
% DPER < IPER					46.61		DPER		37.3	5		IPER	6	9.97	
Assessor Details	Mr.	Darren C	oham									Assessor	r ID R	789-0	001
Client															
SUMMARY FOR INPL	JT DAT	A FOR:	Nev	/ Build (/	As Desi	igned)									
Orientation					Southw	vest									
Property Tenture					ND										
Transaction Type					6										
Terrain Type					Urban										
1.0 Property Type					Flat, De	etached									
Position of Flat					Top-flo	or flat									
Which Floor					7										
2.0 Number of Storeys					1										
3.0 Date Built					2023										
4.0 Sheltered Sides					0										
5.0 Sunlight/Shade					Average or unknown										
6.0 Thermal Mass Parame	eter				Precise calculation										
Thermal Mass					N/A						kJ/m²K				
7.0 Electricity Tariff					Standa	rd									
Smart electricity meter f	fitted				Yes										
Smart gas meter fitted					Yes										
7 0 Measurements															
						Basemen Ground floo 1st Storey 2nd Storey 3rd Storey 4th Storey 5th Storey 6th Storey 7th Storey	Heat t: 7: 7: 7: 7: 7: 7: 7: 7: 7: 7: 7: 7: 7:	Loss Pe 0.00 m 46.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m 0.00 m	erimete 1 1 1 1 1 1 1 1 1 1 1 1 1	r In	ternal F 0.00 116.0 0.00 0.00 0.00 0.00 0.00 0.0	(loor Area) m ²)4 m ²) m ²	Averag	e Stor 0.00 2.70 0.00 0.00 0.00 0.00 0.00 0.00	ey Height m m m m m m m m m
8.0 Living Area					48.78							m²			
9.0 External Walls															
Description	Туре	- 11	Constr	uction			U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Opening	gs Area	a Calculation Type
External Wall 1	Cavity W Cavity W	all	Cavity v filled ca Cavity v filled ca	vall : plasterb vity, any outs vall : plasterb vity, any outs	oard on dal ide structur oard on dal ide structur	os, AAC block, e os, AAC block, e	0.18 0.18	60.00 60.00	102.74 21.46	62.90 19.36	0.00	None Stairwell Acc Corridor 4	39.84 ess 2.10	Ente	liate vvall Are er Gross Area
9.1 Party Walls															
Description	Ту	ре		Construc	tion					U-Value		a Area	Shelter	S	helter
Party Wall 1	Fill Ed	ed Cavity ge Sealin	v with Ig	Plasterbo sides, AA	ard on da C blocks	abs mounted o , cavity	on cemen	t render	on both	0.00	45.00) 20.36	0.00	I	None
9.2 Internal Walls Description				Construct	ion								Ka (kJ/	ppa m²K)	Area (m²)
Internal Wall 1				Plasterboa	rd on tim	ber frame							9.	00	190.73
10.0 External Roofs															



Description	Туре	Construc	tion		U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m [:]	Ne) Are	tt She a Co	lter Shelte de Facto	er Calculatior r Type	Openings
External Roof 1	External Flat Roof	Plasterbo	ard, insulated flat r	roof	0.11	9.00	116.04	0.0	0 Noi	ne 0.00	Enter Gross Area	6.00
11.1 Party Floors												
Description		Storey	Construction								Kappa	Area (m²)
Party Floor 1		Index Lowest occupied	Precast concrete	plank floor (screed laid c	on insulat	tion), car	peted			(KJ/m²K) 30.00	116.04
12.0 Opening Types												
Description	Data Source	Туре	Glazin	g		Glazi Gap	ng Fi	ling /pe	G-valu	e Frame Type	e Frame Factor	U Value (W/m²K)
Entrance Doors Windows	Manufacturer Manufacturer	Solid Doo Window	r Double	e Low-E Soft	0.05		Air Air	Filled Filled	0.00 0.63	Wood	0.70 0.75	1.00 1.20
13.0 Openings												
Name	Opening Ty	pe	Location			Ori	entation		Are	ea (m²)	Pit	ch
ed1	Entrance Do	oors	Sheltered Wa	all		Soi	uth West			2.96 2.10	()
w3	Windows		External Wal	1 1		No	rth East		ł	5.04	()
w2 w4	Windows		External Wal	II 1		No	rth East			+.32 3.24	()
w5	Windows		External Wal	1 1		So	uth East			5.40	()
w7	Windows		External Wal	II 1		So	uth West		ļ	5.40	(,
14.0 Conservatory			None									
15.0 Draught Proofing			100						%			
16.0 Draught Lobby			No									
17.0 Thermal Bridging			Calculate Bri	idges								
17.1 List of Bridges						_						
E1 Steel lintel with per	forated steel base r	olate	Source Type	sessed	Length 17 62	Psi 0.07	7 Adj	usted	Referen Thermal	ce: Iv Broken		Imported Yes
E4 Jamb			Independently as	sessed	42.50	0.02	2 0	.02	Knauf	5		Yes
E14 Flat roof	i dwellings (in block	s or nais)	Independently as	sessed sessed	46.00	0.05	5 0	.07 .05	Knauf			Yes
E16 Corner (normal)	internal area great	or then	Independently as	sessed	13.50	0.05	5 0	.05	Knauf			No
external area) E8 Balcony within a dv	velling, wall insulation	on	Table K1 - Default	t	13.00	-0.0) 0	.10	Default			No
Y-value			0.04						W/m	2K		
Description			Arch									
			Vee									
			Yes							m ²) @ 50	Po	
Property Tested?			3.00 Yes							1.111-) @ 50	Ра	
Test Method			Blower Door						=			
As Built AP50			0.10						 	n.m²) @ 50	Pa	
19.0 Mechanical Ventilati	ion								_			
Mechanical Ventilation	on											
Mechanical Vent	ilation System Pres	ent	Yes						7			
Approved Installa	ation		No						Ī			
Mechanical Vent	ilation data Type		Database						ī			
Туре			Balanced me	echanical ver	ntilation with	heat rec	overy		Ī			
MV Reference N	umber		500082						ī			
Configuration			2						Ξ́			
Manufacturer SF	P		0.84						ī			
Duct Type			Rigid						Ť			
M\/HR Efficiency	,		89.00						Ξ́			
			2									
vvet Kooms			2						4			
SFP from Installe	er Commissioning C	ertificate	No						_			
MVHR System L	ocation		Inside heated	d envelope (installed exc	lusively)						



Duct Installation Specification	Level 1]	
20.0 Fans, Open Fireplaces, Flues					
21.0 Fixed Cooling System	No			7	
22.0 Lighting	L				
No Fixed Lighting	No]	
	Name Lighting 1	Efficacy 80.00	Power 6	Capacity 480	Count 10
24.0 Main Heating 1	SAR table			 7	
Percentage of Heat					
	0				
	Electricity			_ _	
SAP Code	224			_ _	
In Winter	170.00				
In Summer	170.00]	
Controls SAP Code	2207]	
Delaved Start Stat	No]	
HETAS approved System	No]	
	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 thi	in screed		7	
Flow Temperature	Enter value]	
Flow Temperature Value	45.00]	
Boiler Interlock	No]	
25.0 Main Heating 2	None			7	
26.0 Heat Networks	None				
Heat Source Fuel Type Heating L	Jse Efficiency	Percentage Of Heat	leat Heat Ele Power	ectrical Fuel Factor	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]	
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
Summary for Input Data



29.0 Hot Water C	ylinder			Hot Water	r Cylinder						
Cylinder Stat				Yes							
Cylinder In He	ated Space			Yes							
Independent 7	ime Control			Yes							
Insulation Typ	е			Measured	Loss						
Cylinder Volu	ne			150.00					L		
Loss				1.70					kWh/da	iy	
Pipes insulation	on			Fully insu	lated prim	ary pipework					
In Airing Cupb	oard			No							
31.0 Thermal Sto	re			None							
32.0 Photovoltai	c Unit			Multiple D)wellings -	- Connected					
Export Capab	le Meter?			Yes							
Connected To	Dwelling			Yes							
Diverter				No							
Battery Capac	tity [kWh]			0.00							
PV Cell	s kWp	Orientation	Elevation	Over	shading	FGHRS	MCS Certificate	Overs Facto	shading or	MCS Certificate	Panel Manufacturer
0.80		South	30°	None	or Little	No	No	1.00		Reference	
34.0 Small-scale	Hydro			None							
Electricity Ger	nerated			0.00							
Apportioned				0.00					kWh/Ye	ear	
Connected to dwelling's electricity meter			Yes								
Electricity Ger	neration			Annual							
Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	t Nov	Dec

Recommendations

Lower cost measures None

Further measures to achieve even higher standards None

Predicted Energy Assessment



Flat 15, Luton, Bedfordshire, LU1 3HX

Dwelling type: Date of assessment: Produced by: Total floor area: DRRN: Flat, Detached 05/07/2023 Darren Coham 116.04 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.



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. 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.

Thermal Bridging



Property Reference Flat 15					Issued on Date 05/07/2023			
Assessment	Reference	000015		Prop T	ype Ref	Detached Flat		
Property Flat 15, Luton, Bedfordshire, LU1 3								
SAP Rating			84 B	DER	3.44	TER		13.06
Environment	al		97 A	% DER < TER				73.66
CO ₂ Emissio	ns (t/year)		0.37	DFEE	41.37	TFEE		41.68
Compliance	Check		See BREL	% DFEE < TFEE				0.76
% DPER < TF	PER		46.61	DPER	37.35	TPER		69.97
Assessor Details Mr. Darren Coham						Asses	sor ID	R789-0001
Client								
	Junction details			Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E1 Steel lin	el with perforated stee	el base plate	Independently assessed	0.068	17.62	1.20	Thermally Broken
External wall	E4 Jamb			Independently assessed	0.018	42.50	0.76	Knauf
External wall	E7 Party flo flats)	or between dwellings (in blocks of	Independently assessed	0.065	46.00	2.99	Knauf
External wall	E14 Flat roof			Independently assessed	0.052	46.00	2.39	Knauf
External wall	E16 Corner (normal)		Independently assessed	0.048	13.50	0.65	Knauf	
External wall	E17 Corner (inverted – internal area greater than external area)		Independently assessed	-0.090	2.70	-0.24	Knauf	
External wall	E8 Balcony continuous	within a dwelling, wall	insulation	Table K1 - Defaul	t 0.100	13.00	1.30	Default

Total:	181.32	W/mK:
Y-Value:	0.04	W/m²K



Appendix B - Part L 2021 BRUKL Document for Non-Domestic Areas



BRUKL Output Document

Compliance with England Building Regulations Part L 2021

Project name

Units 1 & 2

As designed

Date: Wed Jul 05 13:40:36 2023

Administrative information

Building Details

Address: Units 1 & 2, 2 Gloucester road, Luton, LU1 3HX

Certifier details

Name: Darren Coham Telephone number: 01206 489019 Address: Suite 3, Aster House, Elmstead Market, CO7 7FD Calculation engine: TAS

Certification tool

Calculation engine version: "v9.5.5" Interface to calculation engine: TAS Interface to calculation engine version: v9.5.5 BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 153.57

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	1.63	
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	1.31	
Target primary energy rate (TPER), kWh _{PE} /m²annum17.35		
Building primary energy rate (BPER), kWh _{PE} /m ² annum 13.47		
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	Ua-Limit	Ua-Calc	U i-Calc	First surface with maximum value
Walls*	0.26	0.18	0.18	External Wall - Pro
Floors	0.18	0.18	0.18	Ground Floor
Pitched roofs	0.16	-	-	No pitched roofs in project
Flat roofs	0.18	-	-	No flat roofs in project
Windows** and roof windows	1.6	1.2	1.2	Door 1b
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	-	-	No personnel doors in project
Vehicle access & similar large doors	1.3	-	-	No vehicle access or similar large doors in proje
High usage entrance doors	3	-	-	No high usage entrance doors in project
Ua-Limit = Limiting area-weighted average U-values [W/(m2	K)]		U i-Calc = Ca	alculated maximum individual element U-values [W/(m ² K)]

 $U_{a\text{-Limit}} = \text{Limiting area-weighted average U-values } [W/(m^2K)] \\ U_{a\text{-Calc}} = \text{Calculated area-weighted average U-values } [W/(m^2K)]$

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

** Display windows and similar glazing are excluded from the U-value check.

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

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	3

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- vrf mechanical ventilation (5 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency	
This system	4	6	-	-	0.8	
Standard value	2.5*	5	N/A	N/A	N/A	
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO						
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.						

2- Extract (4 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO					

3- Natural Ventilation

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO					

1- pou

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents			
A	Local supply or extract ventilation units			
В	Zonal supply system where the fan is remote from the zone			
С	Zonal extract system where the fan is remote from the zone			
D	Zonal balanced supply and extract ventilation system			
Е	Local balanced supply and extract ventilation units			
F	Other local ventilation units			
G	Fan assisted terminal variable air volume units			
Н	Fan coil units			
I	Kitchen extract with the fan remote from the zone and a grease filter			
NB: L	NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.			

Zone name		SFP [W/(I/s)]							UD officionav			
ID of system type	A	В	С	D	Е	F	G	Н	I	HR efficiency		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
Unit 1 - Office 1	-	-	-	-	1.6	-	-	-	-	-	N/A	
Unit 1 - Office 2	-	-	-	-	1.6	-	-	-	-	-	N/A	
Unit 1 - Kitchenette	0.3	-	-	-	-	-	-	-	-	-	N/A	

Zone name	SFP [W/(I/s)]							UD officiency				
ID of system type	Α	В	С	D	Е	F	G	Н	I	нк епісіепсу		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
Unit 1 - Toilet	0.3	-	-	-	-	-	-	-	-	-	N/A	
Unit 2 - Office 1	-	-	-	-	1.6	-	-	-	-	-	N/A	
Unit 2 - Office 2	-	-	-	-	1.6	-	-	-	-	-	N/A	
Unit 2 - Office 3	-	-	-	-	1.6	-	-	-	-	-	N/A	
Unit 2 - Kitchenette	0.3	-	-	-	-	-	-	-	-	-	N/A	
Unit 2 - Toilet	0.3	-	-	-	-	-	-	-	-	-	N/A	

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m ²]
Standard value	95	80	0.3
Unit 1 - Office 1	100	-	-
Unit 1 - Office 2	100	-	-
Unit 1 - Entrance	100	-	-
Unit 1 - Corridor	100	-	-
Unit 1 - Kitchenette	100	-	-
Unit 1 - Toilet	100	-	-
Unit 2 - Entrance	100	-	-
Unit 2 - Office 1	100	-	-
Unit 2 - Office 2	100	-	-
Unit 2 - Office 3	100	-	-
Unit 2 - Kitchenette	100	-	-
Unit 2 - Toilet	100	-	-
Unit 2 - Store	100	-	-
Unit 1 - Store	100	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 1 - Office 1	NO (-34%)	NO
Unit 1 - Office 2	NO (-13%)	NO
Unit 1 - Kitchenette	N/A	N/A
Unit 2 - Office 1	NO (-56%)	NO
Unit 2 - Office 2	NO (-35%)	NO
Unit 2 - Office 3	NO (-17%)	NO
Unit 2 - Kitchenette	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?			
Is evidence of such assessment available as a separate submission?	NO		
Are any such measures included in the proposed design?	YES		

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional	% Ar
Floor area [m ²]	311	311	
External area [m ²]	377	377	
Weather	LON	LON	100
Infiltration [m ³ /hm ² @ 50Pa]	3	3	
Average conductance [W/K]	140	144	
Average U-value [W/m ² K]	0.37	0.38	
Alpha value* [%]	36.33	21.33	

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

Building Use

% Area Building Type

Retail/Financial and Professional Services Restaurants and Cafes/Drinking Establishments/Takeaways
Offices and Workshop Businesses
General Industrial and Special Industrial Groups Storage or Distribution Hotels
Residential Institutions: Hospitals and Care Homes Residential Institutions: Residential Schools
Residential Institutions: Universities and Colleges Secure Residential Institutions Residential Spaces
Non-residential Institutions: Community/Day Centre Non-residential Institutions: Libraries, Museums, and Galleries Non-residential Institutions: Education
Non-residential Institutions: Primary Health Care Building Non-residential Institutions: Crown and County Courts General Assembly and Leisure, Night Clubs, and Theatres
Others: Passenger Terminals Others: Emergency Services Others: Miscellaneous 24hr Activities
Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	2.67	2.46
Cooling	3.34	4.3
Auxiliary	2.22	2.05
Lighting	8.25	8.13
Hot water	2.41	2.29
Equipment*	36.41	36.41
TOTAL**	18.89	19.23

* Energy used by equipment does not count towards the total for consumption or calculating emissions. ** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	10.29	7.46
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	10.29	7.46

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	88.34	89.06
Primary energy [kWh _{PE} /m ²]	13.47	17.35
Total emissions [kg/m ²]	1.31	1.63

HVAC Systems Performance										
Sys	stem Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST	[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
	Actual	11.1	89.7	0.8	4.2	2.8	4	6	4	6
	Notional	12.1	89.4	1.3	5.6	2.7	2.64	4.4		
[ST] Unflued ra	adiant heate	er, [HS] Unf	lued radian	t heater, [H	FT] Electric	ity, [CFT] E	ectricity		
	Actual	29.6	0	8.2	0	0	1	0	1	0
	Notional	43.9	0	9.1	0	0	1.34	0		
[ST	[ST] Unflued radiant heater, [HS] Unflued radiant heater, [HFT] Electricity, [CFT] Electricity									
	Actual	43.8	0	12.2	0	0	1	0	1	0
	Notional	39.3	0	8.2	0	0	1.34	0		

Key to terms

CFT

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

- = System type
- = Heat source
- = Heating fuel type
- = Cooling fuel type

Energy Performance Certificate

HM Government

Non-Domestic Building

Units 1 & 2 2 Gloucester road Luton LU1 3HX Certificate Reference Number:

6<mark>913-</mark>6907-2550-6837-9952

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied E	lectricity			
Building environment:	Air Conditioning				
Total useful floor area (m ²):		311			
Building complexity:		Level 5			
Building emission rate (kgCO ₂ /m ² per year): 1.31					
Primary energy use (kWh _P /r	n²per year):	13.47			

Benchmarks

Buildings similar to this one could have ratings as follows:



If newly built

If typical of the existing stock

Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	TAS v9.5.5 using calculation engine TAS v9.5.5
Property Reference:	UPRN-123456789012
Assessor Name:	Darren Coham
Assessor Number:	LCEA159477
Accreditation Scheme:	CIBSE Certification Limited
Assessor Qualifications:	NOS5
Employer/Trading Name:	Elmstead Energy Assessors & Building Services
Employer/Trading Address:	Suite 3, Aster House, Lanswood Park, Elmstead Market
Issue Date:	05 Jul 2023
Valid Until:	04 Jul 2033 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 4106-1511-2132-7745-0233

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by CIBSE Certification Limited. You can obtain contact details of the Accreditation Scheme at www.cibsecertification.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at:

www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.