



SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 1, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference						5/12/2023
Assessment	001		Pi	rop Type Ref	New Dwelling Part L 202	1
Reference Property	Plot 1 , Bitterne Parish C	hurch Whites I	ana Ritterna So	uthampton k	Jampshira SO10 7ND	
	Flot 1, bitterne Fansii C		1			
SAP Rating		88 B	DER	13.07	TER	24.89
Environmental		89 B	% DER <ter< td=""><td></td><td>47.50</td><td></td></ter<>		47.50	
CO₂ Emissions (t/ye	•	1.00	DFEE	40.37	TFEE	51.83
General Requireme	nts Compliance	Pass	% DFEE <tfee< th=""><th></th><th>22.12</th><th></th></tfee<>		22.12	
Assessor Details	Mr. Mark Rogers, Surecalc L mark@surecalc.co.uk	imited, Tel: 012	243572695,		Assessor ID A	320-0001
Client	Vivid Design Studio, Vivid De	esign Studio				
	ission Rate calculation	55.6.1 5444.5				
Total floor area				98.5	m²	
DER				13.07	kgCO ₂ /yr/m ²	
TER				24.89	kgCO ₂ /yr/m ²	
	ffset from additional allowab	le electricity ge	neration	0.00	kgCO ₂ /yr/m ²	
	issions offset from biofuel CF			0.00	kgCO ₂ /yr/m ²	
	ons offset from SAP Section 1			0.00	kgCO ₂ /yr/m ²	
	for SAP Section 16 allowance			13.07	kgCO ₂ /yr/m ²	
Reduction DER/T				47.50	%	
CfSH ENE1 credit				5.2		
CfSH ENE1 level	acnieved			4		
	y Efficiency calculation			4		
					emi-Detached	
ENE 2 – Fabric Energ	y Efficiency calculation				emi-Detached kWh/m²/yr	
ENE 2 – Fabric Energ	y Efficiency calculation			House, S		
Dwelling type Fabric energy effi CfSH ENE2 credits	y Efficiency calculation			House, So 40.37		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2	y Efficiency calculation diciency (F.E.E.) s achieved	ılation		House, S 40.37 8.4		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcu	ılation		House, S 40.37 8.4		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcu	ılation		House, S 40.37 8.4		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcu	ılation		House, So 40.37 8.4 4	kWh/m²/yr	
ENE 2 – Fabric Energy Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcu	ılation		House, So 40.37 8.4 4	kWh/m²/yr	(ZC2)
ENE 2 – Fabric Energy Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER	y Efficiency calculation diciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances	ılation		House, S. 40.37 8.4 4 98.5 18.34	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC2) (ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking	ılation		House, S 40.37 8.4 4 98.5 18.34 15.27	m ² kgCO ₂ /yr/m ²	, ,
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions	ılation		House, S. 40.37 8.4 4 98.5 18.34 15.27 1.87	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ılation		House, So 40.37 8.4 4 98.5 18.34 15.27 1.87 35.49	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case tot Net Standard case	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ılation		House, So 40.37 8.4 4 98.5 18.34 15.27 1.87 35.49	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ılation		House, So 40.37 8.4 4 98.5 18.34 15.27 1.87 35.49 35.49	m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m²	(ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances	ılation		House, S. 40.37 8.4 4 98.5 18.34 15.27 1.87 35.49 35.49	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from Standard case total Co ₂ emissions from Co ₃ emissions from DER CO ₄ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking	ılation		House, S. 40.37 8.4 4 98.5 18.34 15.27 1.87 35.49 35.49 16.17 15.27	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC3) (ZC4) (ZC8)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case total Net Standard case DER CO2 emissions from CO3 emissions from CO4 emissions from Standard case total Net Standard case CO2 emissions from CO3 emissions from CO4 emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking cooking cooking cooking cooking	ılation		98.5 18.34 15.27 1.87 35.49 16.17 15.27 1.87	m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC2)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case total Net Standard case DER CO2 emissions from CO3 emissions from CO4 emissions from CO5 emissions from CO5 emissions from CO6 emissions from Actual case total CO6 emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking cooking cooking cooking cooking		n	98.5 18.34 15.27 1.87 35.49 35.49 16.17 15.27 1.87 33.32	m² kgCO2/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case total CO ₂ emissions from Actual case CO ₂ emissions from Actual case total CO ₂ emissions from Actual case total CO ₂ reduction from Net Actual case CO ₂	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking com cooking om electrical appliances om additional allowable electrical	ricity generatio	n	98.5 18.34 15.27 1.87 35.49 35.49 16.17 15.27 1.87 33.32 0.00	m² kgCO2/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:16:31

Project Information			
Assessed By	Mark Rogers	Building Type	House, Semi-detached
OCDEA Registration	EES/004179	Assessment Date	2023-12-06

Dwelling Details			
Assessment Type	As designed	Total Floor Area	98 m ²
Site Reference	sc100228 P1 Bitterne Church	Plot Reference	001
Address	Bitterne Parish Church Plot 1	Whites Lane, Southampton, SO	19 7NP

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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 ra	ate			
Fuel for main heating system	Electricity			
Target carbon dioxide emission rate	10.44 kgCO₂/m²			
Dwelling carbon dioxide emission rate	3.83 kgCO ₂ /m ²	OK		
1b Target primary energy rate and dwelling prima	ary energy			
Target primary energy	54.43 kWh _{PE} /m ²			
Dwelling primary energy	39.83 kWh _{PE} /m ²	OK		
1c Target fabric energy efficiency and dwelling fabric energy efficiency				
Target fabric energy efficiency	36.9 kWh/m²			
Dwelling fabric energy efficiency	34.8 kWh/m ²	OK		

2a Fabric U-values						
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value			
External walls	0.26	0.22	Walls (1) (0.22)	OK		
Party walls	0.2	0	Party Wall (1) (0)	N/A		
Curtain walls	1.6	0	N/A	N/A		
Floors	0.18	0.11	Ground Floor (0.11)	OK		
Roofs	0.16	0.09	Roof (1) (0.09)	OK		
Windows, doors,	1.6	1.2	Front East Door (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)	84.24	0.22			
Exposed wall: Walls (2)	6	0.21			
Party wall: Party Wall (1)	47.38	0 (!)			
Ground floor: Ground Floor, Ground Floor	49.7	0.11			
Exposed roof: Roof (1)	49.7	0.09 (!)			

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]
Front East Door, New Dwell Entrance	2.01	East	N/A	1.2
Door				
Front East Windows, New Dwelling DG	2.73	East	0.7	1.2
Window				
Front East Window, New Dwelling DG	1.9	East	0.7	1.2
Window				
Side South Windows, New Dwelling DG	2.87	South	0.7	1.2
Window				
Rear West Windows, New Dwelling DG	3.94	West	0.7	1.2
Window				
Rear West Windows, New Dwell DG	3.92	West	0.7	1.2
French Doors				

Name	Area [m²]	Orientation	Frame factor	U-Value [W/m ² K]

2d Thermal brid	2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
	Main Dwelling: Thermal bridging ca			unction	
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference	
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +	
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail	
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised Construction Detail	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail	
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.1	Recognised Construction Detail	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)		
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail	
External wall	E24: Eaves (insulation at ceiling level - inverted)	SAP table default	0.15		

3 Air permeability (better than typically expected values are flagged with a subsequent (!))					
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²				
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK			
Air permeability test certificate reference					

4 Space heating							
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity							
Efficiency	233.9%						
Emitter type	Radiators						
Flow temperature	55°C						
System type	Heat Pump						
Manufacturer	Daikin Europe NV						
Model	EDLA04EV3						
Commissioning							
Secondary heating system: N/A							
Fuel	N/A						
Efficiency	N/A						
Commissioning							

5 Hot water			
Cylinder/store - type: Cylinder	400 14		
Capacity	180 litres		
Declared heat loss	1.39 kWh/day		
Primary pipework insulated	Yes		
Manufacturer			
Model			
Commissioning			
Waste water heat recovery system 1 -	type: N/A		
Efficiency			
Manufacturer			
Model			
6 Controls			
Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical s	ervices
Function		, ,	
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosta	at and HW separately	timed	
Manufacturer			
Model			
7 Lighting	75 / 44/		
Minimum permitted light source efficacy	75 lm/W		01/
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model			
Commissioning			
9 Local generation			
N/A			
IN/A			
10 Heat networks			
N/A			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration			
		ontents of this BREL Compliance Report	
		nformation submitted for this dwelling for	
		, and that the supporting documentary	
evidence (SAP Conventions, Appendi			
documentary evidence required) has	been reviewed in the	course of preparing this BREL	
Compliance Report.			
Signed:		Assessor ID:	
Name:		Date:	
1.011.15			
b. Client Declaration			
N/A			

Predicted Energy Assessment



Plot 1, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

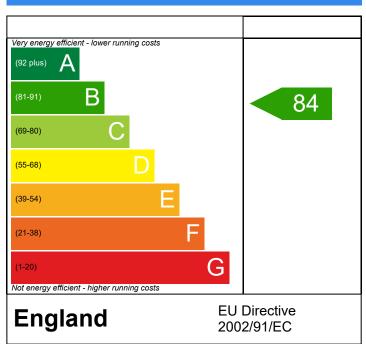
Dwelling type: House, Semi-Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 98.5 m²

DRRN: 9962-8226-7083

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.

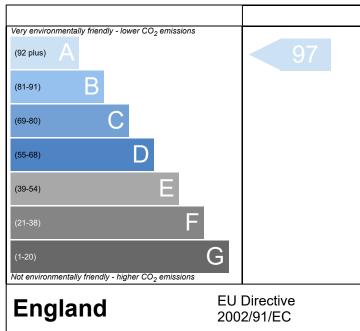
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc1002	28 P1 Bitterne Ch	nurch					Issue	d on Da	te	06/12/202	23
Assessment Reference	001				Pro	p Type I	Ref	New D	welling			
Property	Plot 1,	Bitterne Parish C	hurch, Whites Lane, S	outhampt	ton, Ham	npshire ,	SO19 7N	P				
SAP Rating			84 B	DER		3.83	<u> </u>		TER		10.44	
Environmental			97 A		< TER	0.00					63.31	
CO ₂ Emissions (t/year)			0.31	DFEE		34.7	'Q		TFEE		36.86	
Compliance Check			See BREL		E < TFE						5.61	
% DPER < TPER			26.82	DPER		39.8	3		TPER		54.43	
Assessor Details	Mr. Mark Ro								Assess	or ID	A320-	0001
Client		Studio, Philip Du										
SUMMARY FOR INPU	IT DATA FOR	: New Build (As Designed)									
Orientation			East									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Semi-Detach	ed								
2.0 Number of Storeys			2									
3.0 Date Built			2023									
4.0 Sheltered Sides			1									
5.0 Sunlight/Shade			Average or unknown									
6.0 Thermal Mass Parame	ter		Precise calculation									
7.0 Electricity Tariff			Standard									
Smart electricity meter f	itted		No									
Smart gas meter fitted			No									
7.0 Measurements												
			Ground floo		Loss P 21.35	erimete m	r Int	ernal Flo 49.70	oor Area	Av	erage Sto	orey Heigh
			1st Store		20.50			48.80			2.76	
8.0 Living Area			13.88					ı	m²			
9.0 External Walls												
Description	Type	Construction		(W/m ² K)		Area(m²)		Res	Shelte			ea Calculatio Type
External Cavity Wall	Cavity Wall		pard on dabs or battens, e block, filled cavity, any	0.22	110.00	99.71	84.24	0.00	None	,	15.47 Cal	culate Wall Ar
External Tile Hung Wall	Cavity Wall	Cavity wall; plasterbo	pard on dabs or battens, be block, filled cavity, any	0.21	110.00	7.90	6.00	0.00	None	•	1.90 Er	nter Gross Are
9.1 Party Walls												
Description	Туре	Construc	ction				U-Value					Shelter
Party Wall	Filled Cavity Edge Sealir		asterboard on dabs bot e blocks, cavity or cavit		ightweig	ht	(W/m²K) 0.00	110.00	(m²) 47.38	Re	s	None
9.2 Internal Walls												
Description		Construct	ion								Kappa (kJ/m²K)	Area (m²
Internal Stud Walls		Plasterboa	rd on timber frame								9.00	187.53
10.0 External Roofs	_						_					_
Description	Туре	Construction	l			Kappa kJ/m²K)/	Gross Area(m²)	Nett Area		Shelter Factor	Calculati Type	onOpening
External Pitched Roofs	External Plane Roof	e Plasterboard,	insulated at ceiling leve	•	0.09	9.00	49.70	(m²) 49.70	None	0.00	Calculat Wall Are	
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceiling									rea (m²) 48.80

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11.0 Heat Loss Floors



Description Ground Floor	Type Ground Floor - Solic	Storey Index		Construction Suspended concrete floor,	carnoted	U-Val (W/m 0.1	K)	Shelter Code None	Fa	ctor (kJ/	ppa Area (m²) m²K) .00 49.70
11.2 Internal Floors	Glouliu Flooi - Solic	1 Lowest occup	neu	Suspended concrete floor,	carpeteu	0.1		None	0	1.00 75	.00 49.70
Description		Storey	Cons	struction						Kappa	Area (m²)
Internal Floor		Index	Plast	terboard ceiling, carpe	ted chipboard flo	oor				(kJ/m²ł 9.00	() 48.80
12.0 Opening Types				<u> </u>							
Description	Data Source	Туре		Glazing		Glazing	Filling	G-value	Frame	Frame	
New Dwell Entrance Do New Dwell DG French Doors	or Manufacturer Manufacturer	Half Glaze Window	ed Do	or Double Low-E S Double Low-E S		Gap	Туре	0.36 0.71	Type	0.70 0.70	1.20 1.20
New Dwelling DG Windo	ow Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
13.0 Openings											
Name Front East Door Front East Windows Front East Window Side South Windows Rear West Windows Rear West Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin	Entrance Do ng DG Windo ng DG Windo ng DG Windo ng DG Windo ng DG Windo	or OW OW OW	Location External Cavity Wall External Cavity Wall External Tile Hung Wa External Cavity Wall External Cavity Wall External Cavity Wall	all	Orient: Eas Eas Sou We We	st st st th st	Area (2.0° 2.7° 1.90 2.8° 3.94 3.92	1 3 0 7 4	ı	Pitch
14.0 Conservatory				None							
15.0 Draught Proofing			Ī	100				%			
16.0 Draught Lobby			Ĭ	No				=			
17.0 Thermal Bridging 17.1 List of Bridges			L	Calculate Bridges							
Bridge Type E2 Other lintels (including Sill) E4 Jamb E5 Ground floor (normate) E6 Intermediate floor with E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal)) E17 Corner (inverted – ith external area) E18 Party wall between P1 Party wall - Ground for P2 Party wall - Roof (instead E24 Eaves (insulation at Y-value) 18.0 Pressure Testing Designed APsote Test Method 19.0 Mechanical Ventilation Mechanical Ventilation	thin a dwelling t ceiling level) ceiling level) nternal area great dwellings loor iate floor within a sulation at ceiling l t ceiling level - inv	dwelling evel) erted)	Inder	rce Type pendently assessed pend	Length 12.52 11.56 28.80 21.36 20.50 19.36 3.98 15.08 4.78 10.30 9.20 9.20 9.20 1.98	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 -0.10 0.04 0.15	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10 0.04 0.10 0.00 0.15	Reference: IG or Keysti Recognisec	one Hi The I Construct	ction Detaction Deta	iil No
Mechanical Ventila	ation System Pres	ent		No							
20.0 Fans, Open Fireplace	s, Flues										
21.0 Fixed Cooling System	n			No							
22.0 Lighting								_			
No Fixed Lighting				No							
			Low	Name v energy Lighting	Efficacy 75.00		wer 5	 Capa 112		(Count 36
24 0 Main Heating 4				Database	7 0.00						
24.0 Main Heating 1					at Duma			\dashv			
Description				Electric Air Source He	aı Fullip						
Percentage of Heat				100.00				%			
Database Ref. No.				106465				\dashv			
Fuel Type				Electricity				_			
In Winter			L	0.00							

SAP 10 Online 2.12.2 Page 2 of 4



Ratings after improvement

In Summer	0.00	
Model Name	EDLA04EV3	
Manufacturer	Daikin Europe NV	
System Type	Heat Pump	
Controls SAP Code	2207	
PCDF Controls	0	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None]
Heat Source Fuel Type Heating U		ctrical Fuel Factor Efficiency type
	Heat Power Ratio	
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5		
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	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.1 Showers		
Description Shower Typ	e Flow Rate Rated Power ([l/min] [kW]	Connected Connected To
28.3 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 Type	Measured Loss	
Cylinder Volume	180.00] L
Loss	1.39	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	
31.0 Thermal Store	None	
Recommendations Lower cost measures None Further measures to achieve even higher standards		

SAP 10 Online 2.12.2 Page 3 of 4

Typical savings per year

Typical Cost



£4,000 - £6,000 £3,500 - £5,500 £47 £196 SAP rating B 85 B 91 0

Environmental Impact A 97 A 98 0

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Thermal Bridging



Property Reference	sc100228 P1 Bitterne Church				Issued on Date	06/12/2023	
Assessment Reference	001		Type Ref S	emi-Detached House	;		
Property	Plot 1 , Bitterne Parish (Plot 1 , Bitterne Parish Church, Whites Lane, Southampton, Hampshire , SO19 7NP					
SAP Rating 84 B DER 3.83				3.83	TER	10.44	
Environmental	97 A	% DER < TER	63.31				
CO ₂ Emissions (t/year)		0.31	DFEE	34.79	TFEE	36.86	
Compliance Check		See BREL	% DFEE < TFEE			5.61	
% DPER < TPER		26.82	DPER	39.83	TPER	54.43	
Assessor Details	Mr. Mark Rogers	Mr. Mark Rogers Assessor ID A320-0001					
Client	Vivid Design Studio, Philip D	udley					

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	12.52	0.63	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	11.56	0.21	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.80	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	21.36	1.45	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	20.50	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	19.36	1.06	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	3.98	0.23	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	15.08	0.77	Recognised Construction Detail
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.100	4.78	-0.48	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.20	0.95	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.20	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.20	0.93	Recognised Construction Detail
External wall	E24 Eaves (insulation at ceiling level - inverted)	Table K1 - Default	0.150	1.98	0.30	

Total: 177.82 W/mK: Y-Value: 0.00 W/m²K:

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc121832	sc121832				06/12/2023			
Assessment Reference	001	001				. 2021			
Project	Plot 1 , Bitterne Parish Ch	Plot 1, Bitterne Parish Church, Whites Lane, Bitterne,				uthampton, Hampshire , SO19 7NP			
Calculation Type	New Build (As Designed)	ew Build (As Designed)							
SAP Rating			DER	13.07	TER	24.89			
Environmental		89 B	% DER <ter< th=""><th></th><th>47.50</th><th></th></ter<>		47.50				
CO ₂ Emissions (t/ye	ar)	1.00	DFEE	40.37	TFEE	51.83			
General Requireme	nts Compliance	Pass	% DFEE <tf< th=""><th>E</th><th>22.12</th><th></th></tf<>	E	22.12				
Assessor Details	Mr. Mark Rogers, Surecalc Lim	. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001							
Client	/ivid Design Studio, Vivid Desi	gn Studio	<u> </u>	·					

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

otal esistance. Opper mint = 11.445 m kyw Lower mint = 11.240 m kyw Average = 11.340 m ky

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121832	sc121832				06/12/2023	
Assessment Reference	001	001 Prop Type				2021	
Project	Plot 1 , Bitterne Parish Ch	Plot 1 , Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7					
Calculation Type	New Build (As Designed)	ew Build (As Designed)					
SAP Rating	88 B	DER	13.07	TER	24.89		
Environmental		89 B	% DER <ter< th=""><th></th><th>47.50</th><th></th></ter<>		47.50		
CO ₂ Emissions (t/ye	ar)	1.00	DFEE	40.37	TFEE	51.83	
General Requireme	nts Compliance	Pass	% DFEE <tfi< th=""><th>E</th><th>22.12</th><th></th></tfi<>	E	22.12		
Assessor Details	Mr. Mark Rogers, Surecalc Lim	Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001					
Client	Vivid Design Studio, Vivid Des	gn Studio					

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500	125	0.0340	3.6765	100.00
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121832	sc121832				06/12/2023			
Assessment Reference	e 001			Prop Type Ref	pp Type Ref New Dwelling Part L 2021				
Project	Plot 1 , Bitterne Parish Ch	Plot 1, Bitterne Parish Church, Whites Lane, Bitterne, Southampton				NP			
Calculation Type	New Build (As Designed)	New Build (As Designed)							
SAP Rating	88 B	DER	13.07	TER	24.89				
Environmental		89 B	% DER <ter< th=""><th></th><th>47.50</th><th></th></ter<>		47.50				
CO ₂ Emissions (t/ye	ear)	1.00	DFEE	40.37	TFEE	51.83			
General Requireme	ents Compliance	Pass	% DFEE <tf< th=""><th>E</th><th>22.12</th><th></th></tf<>	E	22.12				
Assessor Details	Mr. Mark Rogers, Surecalc Lim	. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0003							
Client	Vivid Design Studio, Vivid Des	gn Studio	<u> </u>						

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

.ayer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
xt surface				0.0400	
er 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
r 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
er 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
r 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
_	per m ² : 2.500				
r 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
_	Main construction	100	0.8803	0.1136	6.57
er 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
_	Normal				
r 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
urface				0.1300	

Unheated space: None

Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a

Total correction = 0.0016 m² K/W



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

U-value (unrounded) = 0.21 W/m² K



Property Reference	sc121832 Issued on Date				06/12/2023		
Assessment Reference	001 Prop Type Ref New Dwelling Part L 2021					2021	
Project	Plot 1 , Bitterne Parish Ch	urch, Whites L	ane, Bitterne	, Southampton,	Hampshire , SO19 7	NP	
Calculation Type	New Build (As Designed)						
SAP Rating		88 B	DER	13.07	TER	24.89	
Environmental		89 B	% DER <ter< th=""><th></th><th colspan="3">47.50</th></ter<>		47.50		
CO ₂ Emissions (t/year)		1.00	DFEE	40.37	40.37 TFEE 51.83		
General Requirements	Compliance	Pass	% DFEE <tfi< th=""><th>E</th><th colspan="3">22.12</th></tfi<>	E	22.12		
Assessor Details Mr.	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						
Client	id Design Studio, Vivid Desi	gn Studio					

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 49.70 m², Perimeter = 21.35 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		. ,	,	0.1700	. ,
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or				
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total correction = 0.0079 m² K/W U-value (unrounded) = $0.11 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 2, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121833				Issued on Date 06/	/12/2023
Assessment	001		D	rop Type Ref	New Dwelling Part L 2021	12/2023
Reference	001			Top Type Kei	New Dwelling Part L 2021	
Property	Plot 2, Bitterne Parish Chu	urch, Whites L	ane, Bitterne, Soi	uthampton, H	ampshire , SO19 7NP	
SAP Rating		88 B	DER	13.52	TER	25.39
Environmental		89 B	% DER <ter< td=""><td></td><td>46.75</td><td></td></ter<>		46.75	
CO ₂ Emissions (t/year	•)	1.02	DFEE	41.82	TFEE	53.06
General Requirement	s Compliance	Pass	% DFEE <tfee< td=""><td></td><td>21.19</td><td></td></tfee<>		21.19	
	Ar. Mark Rogers, Surecalc Lir nark@surecalc.co.uk	mited, Tel: 012	243572695,		Assessor ID A3	20-0001
Client	ivid Design Studio, Vivid Des	sign Studio			<u> </u>	
ENE 1 - Dwelling Emiss	sion Rate calculation					
Total floor area				97.6	m²	
DER				13.52	kgCO ₂ /yr/m ²	
TER				25.39	kgCO ₂ /yr/m ²	
CO₂ emissions offs	et from additional allowable	e electricity ge	neration	0.00	kgCO ₂ /yr/m ²	(ZC7)
Residual CO₂ emiss	sions offset from biofuel CHI	P		0.00	kgCO ₂ /yr/m ²	(ZC5)
Total CO₂ emission	ns offset from SAP Section 16	6 allowances		0.00	kgCO ₂ /yr/m ²	
DER accounting for	r SAP Section 16 allowances			13.52	kgCO ₂ /yr/m ²	
Reduction DER/TER	R			46.75	%	
CfSH ENE1 credits	achieved			5.2		
CfSH ENE1 level ac	hieved			4		
ENE 2 – Fabric Energy I	Efficiency calculation					_
Dwelling type	·				emi-Detached	
Dwelling type Fabric energy efficie	ency (F.E.E.)			41.82	emi-Detached kWh/m²/yr	
Dwelling type Fabric energy efficie CfSH ENE2 credits a	ency (F.E.E.) achieved			41.82 8.0		
Dwelling type Fabric energy efficion CfSH ENE2 credits a CfSH ENE1 and 2 ov	ency (F.E.E.) achieved verall level achieved			41.82		
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero	ency (F.E.E.) achieved verall level achieved Carbon Technologies calcula	ation		41.82 8.0		
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero (Standard case CO ₂ emi	ency (F.E.E.) achieved verall level achieved Carbon Technologies calcula	ation		41.82 8.0 4	kWh/m²/yr	
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi	ency (F.E.E.) achieved verall level achieved Carbon Technologies calcula	ation		41.82 8.0 4 97.6	kWh/m²/yr	
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE7 – Low and Zero (Standard case CO ₂ emi Total floor area DER	ency (F.E.E.) achieved verall level achieved Carbon Technologies calcula issions	ation		41.82 8.0 4 97.6 18.84	kWh/m²/yr m² kgCO₂/yr/m²	(7(2))
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi Total floor area DER CO ₂ emissions from	ency (F.E.E.) achieved verall level achieved Carbon Technologies calcula issions	ation		97.6 18.84 15.32	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2)
Dwelling type Fabric energy efficience CfSH ENE2 credits and 2 over ENE7 – Low and Zero (Standard case CO ₂ eminor area DER CO ₂ emissions from CO ₂ emissions from	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations issions n electrical appliances	ation		41.82 8.0 4 97.6 18.84	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations a electrical appliances a cooking CO ₂ emissions	ation		97.6 18.84 15.32 1.89 36.05	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero (Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total Net Standard case (ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations n electrical appliances n cooking CO ₂ emissions	ation		97.6 18.84 15.32 1.89	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3)
Dwelling type Fabric energy efficience CfSH ENE2 credits and 2 over ENE7 – Low and Zero of Standard case CO2 emits Total floor area DER CO2 emissions from CO2 emissions from Standard case total Net Standard case C	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations n electrical appliances n cooking CO ₂ emissions	ation		97.6 18.84 15.32 1.89 36.05	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total Net Standard case C Actual case CO ₂ emissi DER	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations n electrical appliances n cooking CO ₂ emissions	ation		97.6 18.84 15.32 1.89 36.05	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total Net Standard case C Actual case CO ₂ emissi DER	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations a electrical appliances a cooking CO ₂ emissions CO ₂ emissions ions a electrical appliances	ation		97.6 18.84 15.32 1.89 36.05	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero (Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total Net Standard case (Actual case CO ₂ emissi DER CO ₂ emissions from	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations a electrical appliances a cooking CO ₂ emissions CO ₂ emissions ions a electrical appliances a cooking	ation		97.6 18.84 15.32 1.89 36.05 36.05	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total Net Standard case to Actual case CO ₂ emissi DER CO ₂ emissions from CO ₂ emissions from	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations a electrical appliances a cooking CO ₂ emissions CO ₂ emissions ions a electrical appliances a cooking	ation		97.6 18.84 15.32 1.89 36.05 16.64 15.32 1.89	m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total Net Standard case total Net Standard case (O Actual case CO ₂ emissi DER CO ₂ emissions from CO ₂ emissions from Actual case total CO ₂ emissions from Actual case total CO ₂ emissions from	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations a electrical appliances a cooking CO ₂ emissions CO ₂ emissions ions a electrical appliances a cooking		n	41.82 8.0 4 97.6 18.84 15.32 1.89 36.05 36.05 16.64 15.32 1.89 33.85	kWh/m²/yr m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)
Dwelling type Fabric energy efficie CfSH ENE2 credits a CfSH ENE1 and 2 ov ENE 7 – Low and Zero Standard case CO ₂ emi Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total Net Standard case total Net Standard case (O Actual case CO ₂ emissi DER CO ₂ emissions from CO ₂ emissions from Actual case total CO ₂ emissions from Actual case total CO ₂ emissions from	ency (F.E.E.) achieved verall level achieved Carbon Technologies calculations a electrical appliances a cooking CO ₂ emissions cons a electrical appliances a cooking begin{center} cooking		n	97.6 18.84 15.32 1.89 36.05 36.05 16.64 15.32 1.89 33.85 0.00	kWh/m²/yr m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

\sim			



Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:17:41

Project Information					
Assessed By	Mark Rogers	Building Type	House, Semi-detached		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details			
Assessment Type	As designed	Total Floor Area	98 m ²
Site Reference	sc100229 P2 Bitterne Church	Plot Reference	001
Address	Bitterne Parish Church Plot 2	Whites Lane, Southampton, SO	19 7NP

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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

4. Tayant aminaian yeta and develling aminaian	wat a	
1a Target emission rate and dwelling emission	rate	
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	10.66 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	3.91 kgCO ₂ /m ²	OK
1b Target primary energy rate and dwelling prin	nary energy	
Target primary energy	55.61 kWh _{PE} /m ²	
Dwelling primary energy	40.74 kWh _{PE} /m ²	OK
1c Target fabric energy efficiency and dwelling	fabric energy efficiency	
Target fabric energy efficiency	37.4 kWh/m²	
Dwelling fabric energy efficiency	35.8 kWh/m ²	OK

2a Fabric U-values	•			
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	Walls (1) (0.22)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.11	Ground Floor (0.11)	OK
Roofs	0.16	0.09	Roof (1) (0.09)	OK
Windows, doors,	1.6	1.2	Front East Door (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)	83.28	0.22		
Exposed wall: Walls (2)	6	0.21		
Party wall: Party Wall (1)	47.38	0 (!)		
Ground floor: Ground Floor, Ground Floor	48.8	0.11		
Exposed roof: Roof (1)	48.8	0.09 (!)		

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]	
Front East Door, New Dwell Entrance	2.01	East	N/A	1.2	
Door					
Front East Windows, New Dwelling DG	2.73	East	0.7	1.2	
Window					
Front East Window, New Dwelling DG	1.9	East	0.7	1.2	
Window					
Side North Windows, New Dwelling DG	1.8	North	0.7	1.2	
Window					
Rear West Windows, New Dwelling DG	3.94	West	0.7	1.2	
Window					
Rear West Windows, New Dwell DG	3.92	West	0.7	1.2	
French Doors					

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]

2d Thermal bri	dging (better than typically expecte	ed values are flagged with a subs	equent (!))	
Building part 1 -	· Main Dwelling: Thermal bridging ca	lculated from linear thermal transmit	tances for each	
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected	ed values are flagged with a subsequent ((!))
Maximum permitted air permeability at 50Pa	$8 \text{ m}^3/\text{hm}^2$	
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Hea	at pump with radiators or underfloor heating - Electricity
Efficiency	233.8%
Emitter type	Radiators
Flow temperature	55°C
System type	Heat Pump
Manufacturer	Daikin Europe NV
Model	EDLA04EV3
Commissioning	
Secondary heating system	: N/A
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water			
Cylinder/store - type: Cylinder	400 14		
Capacity	180 litres		
Declared heat loss	1.39 kWh/day		
Primary pipework insulated	Yes		
Manufacturer			
Model			
Commissioning			
Waste water heat recovery system 1 -	type: N/A		
Efficiency			
Manufacturer			
Model			
6 Controls			
Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical s	ervices
Function		, ,	
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosta	at and HW separately	timed	
Manufacturer			
Model			
7 Lighting	75 / 44/		
Minimum permitted light source efficacy	75 lm/W		01/
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model			
Commissioning			
9 Local generation			
N/A			
IN/A			
10 Heat networks			
N/A			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration			
		ontents of this BREL Compliance Report	
		nformation submitted for this dwelling for	
		, and that the supporting documentary	
evidence (SAP Conventions, Appendi			
documentary evidence required) has	been reviewed in the	course of preparing this BREL	
Compliance Report.			
Signed:		Assessor ID:	
Name:		Date:	
1.011.15			
b. Client Declaration			
N/A			

Predicted Energy Assessment



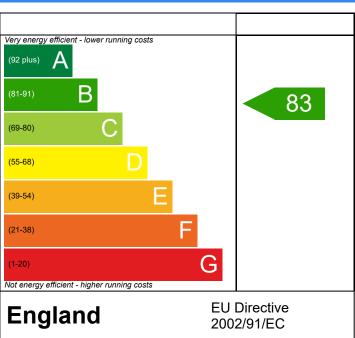
Plot 2, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Semi-Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 97.6 m²
DRRN: 5523-6223-0972

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.

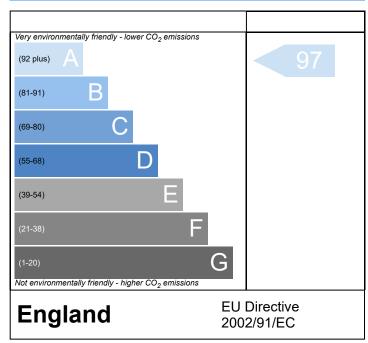
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc1002	229 P2 Bitter	ne Church					Issued	d on Date	9 06/	12/2023
Assessment Reference	001				Pro	p Type I	Ref	New Dw	velling		
Property	Plot 2,	Bitterne Pari	sh Church, Whites Lane	, Southamp	oton, Ham	pshire ,	SO19 7NF)			
SAP Rating			83 B	DER		3.91			TER		10.66
Environmental			97 A	% DE	R < TER						63.32
CO ₂ Emissions (t/year)			0.32	DFEE		35.7	7		TFEE		37.43
Compliance Check			See BREL	% DF	EE < TFE						4.44
% DPER < TPER			26.73	DPE	₹	40.7	4		TPER		55.61
Assessor Details	Mr. Mark Ro	ngere							Assesso	r ID	A320-0001
Client		n Studio, Phi	lin Dudley						71000000		4020-000 i
SUMMARY FOR INPL			. ,								
	JI DAIA I ON	t. New Bul									
Orientation			East								
Property Tenture			ND								
Transaction Type			6								
Terrain Type			Suburban								
1.0 Property Type			House, Semi-Det	ached							
2.0 Number of Storeys			2								
3.0 Date Built			2023								
4.0 Sheltered Sides			1								
5.0 Sunlight/Shade			Average or unkno	wn							
6.0 Thermal Mass Parame	eter		Precise calculation	n							
7.0 Electricity Tariff			Standard								
Smart electricity meter	fitted		No								
Smart gas meter fitted			No								
7.0 Measurements											
			Ground f	loor:	at Loss Po 20.50	m	r Int	ernal Flo 48.80	m²	Avera	ge Storey Heigh 2.39 m
			1st St	orey:	20.50	m		48.80	m²		2.76 m
8.0 Living Area			13.88					n	n²		
9.0 External Walls Description	Туре	Construction		II-Valı	іе Карра	Gross	Nett Area	Shelter	Shelter	r Oneni	ngs Area Calculatio
External Cavity Wall	Cavity Wall		asterboard on dabs or battens,	(W/m²	K) (kJ/m²K)			Res 0.00	None	14.4	Type
·		outside structu									
External Tile Hung Wall	Cavity Wall		asterboard on dabs or battens, pregate block, filled cavity, any re		110.00	7.90	6.00	0.00	None	1.90) Enter Gross Are
9.1 Party Walls		A	struction				U-Value	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
9.1 Party Walls Description	Туре	Con	Struction							1100	None
•	Type Filled Cavi Edge Seali	ty with Sing	le plasterboard on dabs egate blocks, cavity or c		, lightweigl	ht	0.00	110.00	47.38		None
Description	Filled Cavi	ty with Sing	le plasterboard on dabs		, lightweigl	ht			47.38		None
Description Party Wall	Filled Cavi	ty with Sing ing aggi	le plasterboard on dabs		, lightweigl	ht			47.38		appa Area (m
Description Party Wall 9.2 Internal Walls	Filled Cavi	ty with Sing aggi	le plasterboard on dabs egate blocks, cavity or c		, lightweigl	ht			47.38	(k	
Description Party Wall 9.2 Internal Walls Description	Filled Cavi	ty with Sing aggi	le plasterboard on dabs egate blocks, cavity or c truction		, lightweigl	ht			47.38	(k	appa Area (m l/m²K)
Description Party Wall 9.2 Internal Walls Description Internal Stud Walls	Filled Cavi	ty with Sing aggi	le plasterboard on dabs egate blocks, cavity or c truction erboard on timber frame	avity fill	U-Value I	Карра	0.00	110.00 Nett	Shelter S	(k. Shelter Cal	appa Area (m l/m²K) 9.00 187.53 culationOpenin
Description Party Wall 9.2 Internal Walls Description Internal Stud Walls 10.0 External Roofs	Filled Cavi Edge Seali Type	ty with Sing aggr Cons Plaste Constru	le plasterboard on dabs egate blocks, cavity or c truction erboard on timber frame	avity fill		Карра	0.00	110.00	Shelter S	Shelter Cal Factor	appa Area (m l/m²K) 9.00 187.53

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11.0 Heat Loss Floors



Description	Туре	Storey Index	Cons	struction		U-Valı (W/m²		Shelter Code		elter Kap ctor (kJ/m	pa Area (m²) ²K)
Ground Floor	Ground Floor - Solid	I Lowest occupied	l Susp	pended concrete floor,	carpeted	0.11		None	0	.00 75.0	00 48.80
11.2 Internal Floors Description		Storey C	onstruc	ction						Kappa	Area (m²)
Internal Floor		Index		ard ceiling, carpe	ted chinhoard flo	oor				(kJ/m²K) 9.00	٠,
12.0 Opening Types			lasterbo	ard celling, carpe	ica criipboara iic	501				9.00	40.00
Description	Data Source	Туре		Glazing		Glazing	Filling	G-value	Frame	Frame	U Value
New Dwell Entrance Doo	or Manufacturer	Half Glazed I	Door	Double Low-E S	Soft 0.05	Gap	Type	0.36	Type	Factor 0.70	(W/m²K) 1.20
New Dwell DG French Doors	Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
New Dwelling DG Windo	w Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
13.0 Openings											
Name Front East Door Front East Windows Front East Window Side North Windows Rear West Windows Rear West Windows	New Dwellin New Dwellin New Dwellin New Dwellin	Entrance Door ig DG Window ig DG Window ig DG Window ig DG Window	Exte Exte Exte Exte Exte	ation rnal Cavity Wall rnal Cavity Wall rnal Tile Hung Wa rnal Cavity Wall rnal Cavity Wall rnal Cavity Wall rnal Cavity Wall	all	Orienta Eas Eas Eas Nort Wes Wes	t t t h st	Area ((2.01 2.73 1.90 1.80 3.94 3.92	1 3)) 1	Р	itch
14.0 Conservatory			None	9				\neg			
15.0 Draught Proofing			100					%			
16.0 Draught Lobby			No					=			
17.0 Thermal Bridging 17.1 List of Bridges			Calc	ulate Bridges							
Bridge Type E2 Other lintels (including E3 Sill) E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E18 Party wall between of P1 Party wall - Ground floor P2 Party wall - Intermedi P4 Party wall - Roof (insulation)) hin a dwelling ceiling level) ceiling level) dwellings oor ate floor within a	ls) In	depend depend depend depend depend depend depend depend depend depend	ype ently assessed	Length 11.46 10.50 28.80 20.50 20.50 18.52 1.98 10.30 10.30 9.20 9.20	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 0.04 0.10 0.00 0.10	I Reference: IG or Keyste Recognised	one Hi The Construct Construct Construct Construct Construct Construct Construct Construct	ction Detai ction Detai ction Detai ction Detai ction Detai ction Detai ction Detai ction Detai	No
Y-value			0.00					W/m²K			
18.0 Pressure Testing			Yes								
Designed AP ₅₀			5.05					m³/(h.m²	²) @ 50 Pa	a	
Test Method			Blow	er Door							
19.0 Mechanical Ventilation	n										
Mechanical Ventilation											
Mechanical Ventila	tion System Pres	ent	No								
20.0 Fans, Open Fireplaces	s, Flues										
21.0 Fixed Cooling System			No								
22.0 Lighting											
No Fixed Lighting			No								
		L		ame rgy Lighting	Efficacy 75.00	Pov 1:		Capa 112			ount 36
24.0 Main Heating 1			Data	base							
Description			Elect	tric Air Source He	at Pump			Ħ			
Percentage of Heat			100.0		'			%			
Database Ref. No.			1064					Ħ			
Fuel Type				tricity				Ħ			
In Winter			0.00	-				Ħ			
In Summer			0.00					Ħ			
Model Name			EDL	A04EV3				\exists			
				-							

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Manufacturer	Daikin Europe NV	
System Type	Heat Pump	
Controls SAP Code	2207	
PCDF Controls	0	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None	
Heat Source Fuel Type Heating Us	se Efficiency Percentage Of Heat Heat Elec Heat Power Ratio	strical Fuel Factor Efficiency type
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5	Ratio	
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	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.1 Showers		
Description Shower Type	e Flow Rate Rated Power C [l/min] [kW]	connected Connected To
28.3 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 Type	Measured Loss	
Cylinder Volume	180.00	L
Loss	1.39	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	
31.0 Thermal Store	None	
Recommendations Lower cost measures		

Further measures to achieve even higher standards

Ratings after improvement rating Environmental Impact **Typical Cost** Typical savings per year SAP rating B 84 B 90 £4,000 - £6,000 £3,500 - £5,500 £47 £196 A 97 A 98 0

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Thermal Bridging



Property Reference	sc100229 P2 Bitterne C	Church			Issued on Date	06/12/2023
Assessment Reference	001		Prop	Type Ref	Semi-Detached House	e
Property	Plot 2, Bitterne Parish C	Church, Whites Lane,	Southampton, Hamր	oshire , SO19 7	NP	
SAP Rating		83 B	DER	3.91	TER	10.66
Environmental		97 A	% DER < TER			63.32
CO ₂ Emissions (t/year)		0.32	DFEE	35.77	TFEE	37.43
Compliance Check		See BREL	% DFEE < TFEE			4.44
% DPER < TPER		26.73	DPER	40.74	TPER	55.61
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001
Client	Vivid Design Studio, Philip D	Oudley				

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	11.46	0.57	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	10.50	0.19	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.80	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	20.50	1.39	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	20.50	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.52	1.02	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	1.98	0.11	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.20	0.95	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.20	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.20	0.93	Recognised Construction Detail

Total: 160.46 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121833			ı	ssued on Date	06/12/2023
Assessment Referenc	001		Pro	p Type Ref N	ew Dwelling Part L	2021
Project	Plot 2, Bitterne Parish Chi	urch, Whites L	ane, Bitterne, Sout	hampton, Han	npshire , SO19 7N	IP
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	13.52	TER	25.39
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75	
CO ₂ Emissions (t/ye	ar)	1.02	DFEE	41.82	TFEE	53.06
General Requireme	nts Compliance	Pass	% DFEE <tfee< th=""><th></th><th>21.19</th><th></th></tfee<>		21.19	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	ited, Tel: 0124	13572695, mark@s	surecalc.co.uk	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total correction = 0.0030 m² K/W U-value (unrounded) = 0.09 W/m² K

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference	sc121833				Issued on Date	06/12/2023
Assessment Reference	001		Pi	rop Type Ref	New Dwelling Part L	2021
Project	Plot 2, Bitterne Parish Chu	urch, Whites L	ane, Bitterne, Sou	uthampton, H	ampshire , SO19 7N	IP
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	13.52	TER	25.39
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75	
CO ₂ Emissions (t/year)		1.02	DFEE	41.82 TFEE 53.06		
General Requirements	Compliance	Pass	% DFEE <tfee< th=""><th colspan="3">EE 21.19</th></tfee<>	EE 21.19		
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						
Client	id Design Studio, Vivid Design Studio					

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	. ,
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
ayer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties,	125	0.0340	3.6765	100.00
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500				
ayer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121833				Issued on Date	06/12/2023
Assessment Reference	001		Pi	rop Type Ref	New Dwelling Part L	2021
Project	Plot 2, Bitterne Parish Chu	urch, Whites L	ane, Bitterne, Sou	uthampton, H	ampshire , SO19 7N	IP
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	13.52	TER	25.39
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75	
CO ₂ Emissions (t/year)		1.02	DFEE	41.82 TFEE 53.06		
General Requirements	Compliance	Pass	% DFEE <tfee< th=""><th colspan="3">EE 21.19</th></tfee<>	EE 21.19		
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						
Client	id Design Studio, Vivid Design Studio					

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description		Conductivity		
		(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
.ayer 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
ayer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
ayer 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1300	

Total correction = 0.0016 m² K/W U-value (unrounded) = 0.21 W/m² K

Unheated space: None

> Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a





Property Reference	sc121833				Issued on Date	06/12/2023	
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021	
Project	Plot 2, Bitterne Parish Ch	Plot 2, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP				IP.	
Calculation Type	New Build (As Designed)						
SAP Rating		88 B	DER	13.52	TER	25.39	
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75		
CO ₂ Emissions (t/year)		1.02	DFEE	41.82	41.82 TFEE 53.06		
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th colspan="3">EE 21.19</th></tfe<>	EE 21.19			
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001							
Client Viv	id Design Studio, Vivid Desi	gn Studio					

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 48.80 m², Perimeter = 20.50 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness	Conductivity		
zaye.	20011011	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners:	None or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W Lo	ower limit = 7.603 m ²	K/W	Average =	7.656 m² k
	Total correction = 0.0079 m ² K/W	U-value (unrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 3, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121834				Issued on Date 06	/12/2023
Assessment	001		Pr	op Type Ref	New Dwelling Part L 2021	
Reference						
Property	Plot 3, Bitterne Parish	Church, Whites L	ane, Bitterne, Soι	ıthampton, Ha	ampshire , SO19 7NP	
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< td=""><td></td><td>45.00</td><td></td></ter<>		45.00	
CO ₂ Emissions (t/ye	ear)	0.93	DFEE	42.35	TFEE	54.07
General Requireme	nts Compliance	Pass	% DFEE <tfee< td=""><td></td><td>21.66</td><td></td></tfee<>		21.66	
Assessor Details	Mr. Mark Rogers, Surecal mark@surecalc.co.uk	lc Limited, Tel: 012	243572695,		Assessor ID A3	320-0001
Client	Vivid Design Studio, Vivid	l Design Studio				
ENE 1 - Dwelling Em	ission Rate calculation					
Total floor area				81.4	m²	
DER				14.88	kgCO ₂ /yr/m ²	
TER				27.06	kgCO ₂ /yr/m ²	
CO ₂ emissions of	ffset from additional allow	able electricity ge	neration	0.00	kgCO ₂ /yr/m ²	(ZC7)
Residual CO ₂ em	issions offset from biofuel	I CHP		0.00	kgCO ₂ /yr/m ²	(ZC5)
Total CO₂ emissi	ons offset from SAP Sectio	n 16 allowances		0.00	kgCO ₂ /yr/m ²	
DER accounting	for SAP Section 16 allowar	nces		14.88	kgCO ₂ /yr/m ²	
Reduction DER/1	ΓER			45.00	%	
CfSH ENE1 credi	ts achieved			5.0		
CfSH ENE1 level	achieved			4		
CISIT LIVET IEVEL	acmevea			4		
	y Efficiency calculation			4		
					nd-Terrace	
ENE 2 – Fabric Energ	y Efficiency calculation				nd-Terrace kWh/m²/yr	
ENE 2 – Fabric Energ	y Efficiency calculation			House, Er		
ENE 2 – Fabric Energ Dwelling type Fabric energy effi CfSH ENE2 credit	y Efficiency calculation			House, Er		
Dwelling type Fabric energy efficient CfSH ENE2 credit CfSH ENE1 and 2	y Efficiency calculation iciency (F.E.E.) s achieved	ılculation		House, Er 42.35 7.9		
Dwelling type Fabric energy efficient CfSH ENE2 credit CfSH ENE1 and 2	y Efficiency calculation iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies ca	ılculation		House, Er 42.35 7.9	kWh/m²/yr	
Dwelling type Fabric energy efficiency CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 e Total floor area	y Efficiency calculation iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies ca	ılculation		House, Er 42.35 7.9		
Dwelling type Fabric energy efficient CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 e	y Efficiency calculation iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies ca	ılculation		House, Er 42.35 7.9	kWh/m²/yr	
ENE 2 – Fabric Energy Dwelling type Fabric energy effects CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies ca	ılculation		House, Er 42.35 7.9 4 81.4 19.74 16.19	kWh/m²/yr	(ZC2)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies ca	ilculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20	m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effects CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions	ılculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12	m² kgCO₂/yr/m² kgCO₂/yr/m²	
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions fro	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions	ilculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20	m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effects CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 e Total floor area DER CO2 emissions fro Standard case tot Net Standard case Actual case CO2 emissions	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies camissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ılculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case too Net Standard case Actual case CO ₂ emissions DER	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies camissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions	ilculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case too Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from DER CO ₂ emissions from	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances	ılculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8)
Dwelling type Fabric energy effices CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 e Total floor area DER CO2 emissions fro Standard case too Net Standard case Actual case CO2 emis DER CO2 emissions fro Standard case too Net Standard case CO2 emissions fro Standard case CO3 emis DER CO4 emissions fro CO5 emissions fro CO5 emissions fro CO6 emissions fro	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking	ılculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12 18.46 16.19 2.20	m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3)
Dwelling type Fabric energy effices CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions from CO ₂ emissions from Standard case Actual case CO ₂ emissions from Actual case total	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking com cooking	elculation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 18.46 16.19 2.20 36.84	m² kgCO²/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)
Dwelling type Fabric energy effices CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case total Net Standard case DER CO2 emissions from Standard case CO3 emissions from Standard case CO4 emissions from CO5 emissions from Standard case Actual case CO2 emissions from CO4 emissions from CO5 emissions from Actual case total CO5 emissions from	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking tal CO ₂ emissions em sions			House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12 18.46 16.19 2.20 36.84 0.00	m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credity CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case total Net Standard case Actual case CO2 emissions from Actual case total CO2 emissions from Actual case total CO2 reduction from	cy Efficiency calculation iciency (F.E.E.) s achieved overall level achieved co Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om electrical appliances om cooking com additional allowable electrical electrical allowable electrical electri		n	House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 18.46 16.19 2.20 36.84 0.00 0.00	kWh/m²/yr m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5) (ZC7)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credity CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case total Net Standard case DER CO2 emissions from Standard case CO3 emissions from Standard case Actual case CO2 emis DER CO4 emissions from CO5 emissions from CO5 emissions from CO6 emissions from Actual case total CO6 emissions from Actual case total CO6 reduction from Net Actual case Co6	cy Efficiency calculation iciency (F.E.E.) s achieved overall level achieved co Carbon Technologies ca missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om electrical appliances om cooking com additional allowable electrical electrical allowable electrical electri	ectricity generatio	n	House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12 18.46 16.19 2.20 36.84 0.00	m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:18:27

Project Information					
Assessed By	Mark Rogers	Building Type	House, End-terrace		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details					
Assessment Type	As designed	Total Floor Area	81 m ²		
Site Reference	sc100230 P3 Bitterne Church	Plot Reference	001		
Address	Bitterne Parish Church Plot 3	Bitterne Parish Church Plot 3 Whites Lane, Southampton, SO19 7NP			

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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	11.68 kgCO ₂ /m ²			
Dwelling carbon dioxide emission rate	4.05 kgCO ₂ /m ²	OK		
1b Target primary energy rate and dwelling pri	mary energy			
Target primary energy	61.03 kWh _{PE} /m ²			
Dwelling primary energy	42.3 kWh _{PE} /m ²	OK		
1c Target fabric energy efficiency and dwelling fabric energy efficiency				
Target fabric energy efficiency	38.0 kWh/m²			
Dwelling fabric energy efficiency	36.0 kWh/m ²	OK		

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	Walls (1) (0.22)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.11	Ground Floor (0.11)	OK
Roofs	0.16	0.09	Roof (1) (0.09)	OK
Windows, doors,	1.6	1.2	Front South Door (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)	78.06	0.22
Party wall: Party Wall (1)	47.17	0 (!)
Ground floor: Ground Floor, Ground Floor	40.7	0.11
Exposed roof: Roof (1)	40.7	0.09 (!)

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]
Front South Door, New Dwell Entrance	2.01	South	N/A	1.2
Door				
Front South Windows, New Dwelling	4.18	South	0.7	1.2
DG Window				
Side East Windows, New Dwelling DG	2.16	East	0.7	1.2
Window				
Rear North Windows, New Dwelling DG	3.06	North	0.7	1.2
Window				
Rear North Windows, New Dwell DG	3.33	North	0.7	1.2
French Doors				

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected values are flagged with a subsequent (!))			
Maximum permitted air permeability at 50Pa	8 m³/hm²		
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK	
Air permeability test certificate reference			

4 Space heating		
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity		
Efficiency	232.5%	
Emitter type	Radiators	
Flow temperature	55°C	
System type	Heat Pump	
Manufacturer	Daikin Europe NV	
Model	EDLA04EV3	
Commissioning		
Secondary heating system: N/A		
Fuel	N/A	
Efficiency	N/A	
Commissioning		

5 Hot water		
Cylinder/store - type: Cylinder		
Capacity	180 litres	
Declared heat loss	1.39 kWh/day	
Primary pipework insulated	Yes	
Manufacturer		
Model		
Commissioning		
Waste water heat recovery system 1 - type: N/A		
Efficiency		
Manufacturer		
Model		

6 Controls			
Main heating 1 - type: Time and temper	ature zone control by	arrangement of plumbing and electrical s	ervices
Function			
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosts	at and HW separately	timed	
Manufacturer			
Model			
7 Limbian			
7 Lighting	75 Im /M/		
Minimum permitted light source efficacy	75 lm/W		OK
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model	·		1.4
Commissioning			
	'		
9 Local generation			
N/A			
10 Heat networks			
N/A			
44.0			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration			
This declaration by the assessor is co	onfirmation that the co	ontents of this BREL Compliance Report	
-		nformation submitted for this dwelling for	
		and that the supporting documentary	
evidence (SAP Conventions, Append			
documentary evidence required) has			
Compliance Report.	boom roviowed in the	course of proparing the BREE	
Compilation Report.			
Signed:		Assessor ID:	
Oignou.		/ 10303301 ID.	
Name:		Date:	
ivaille.		Date.	
h Client Declaration		<u> </u>	

N/A

Predicted Energy Assessment



Plot 3, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type:

Date of assessment:

Produced by:

Total floor area:

DRRN:

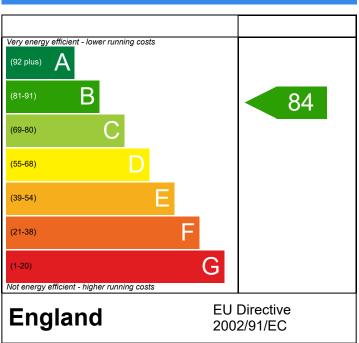
House, End-Terrace
06/12/2023

Mark Rogers
81.4 m²
0520-6251-0972

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.

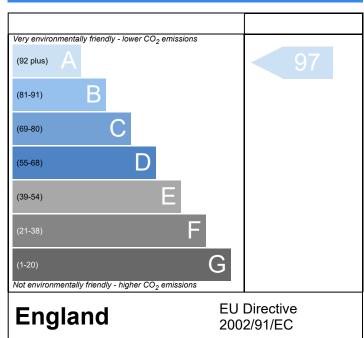
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc1002	230 P3 Bitterne Ch	urch					Issu	ed on Da	ite	06/12	2/2023	
Assessment Reference	001				Prop	Туре	Ref	New D	welling				
Property	Plot 3,	Bitterne Parish Ch	urch, Whites Lane, S	outhampton	n, Hamp	shire ,	SO19 7N	Р					
SAP Rating			84 B	DER		4.0	5		TER		11	.68	
Environmental			97 A	% DER <	< TER	1.00	,					5.33	
CO ₂ Emissions (t/year)			0.27	DFEE		36.0)4		TFEE			7.96	
Compliance Check			See BREL	% DFEE	< TFEE						5.0		
% DPER < TPER			30.70	DPER		42.3	30		TPER			.03	
Assessor Details	Mr. Marda D							=	A	or ID	0.0	200,000	
Client	Mr. Mark Ro	ogers n Studio, Philip Du	dlov						Assess	סו זט	A	320-000	J.1
SUMMARY FOR INPU		•											
	IDAIAFOR	t. New Bulla (A											
Orientation			South										
Property Tenture			ND										
Transaction Type			6					=					
Terrain Type			Suburban										
1.0 Property Type			House, End-Terrace										
2.0 Number of Storeys 3.0 Date Built			2023										
4.0 Sheltered Sides			2023										
5.0 Sunlight/Shade			Average or unknown	`									
6.0 Thermal Mass Paramet	tor		Average or unknown Precise calculation	ı									
			Frecise calculation										
7.0 Electricity Tariff			Standard										
Smart electricity meter fi	tted		No										
Smart gas meter fitted			No										
7.0 Measurements			Ground floo 1st Store	or:	-oss Pe 18.02 n 18.02 n	n	r In	ternal F 40.7 40.7		a Av	_	2.39 m 2.76 m	
8.0 Living Area			18.06						m²				
	Type Cavity Wall	lightweight aggregate	ard on dabs or battens, block, filled cavity, any	U-Value (W/m²K) (I 0.22			Nett Area (m²) 78.06	Shelter Res 0.00	Shelt Non				Calculation Type te Wall Are
9.1 Party Walls		outside structure											
Description	Туре	Construc	tion				U-Value					She	elter
Party Wall	Filled Cavi Edge Seali		sterboard on dabs bo blocks, cavity or cav		htweigh	t	(W/m²K) 0.00	(kJ/m²l 110.00			S	No	one
9.2 Internal Walls Description		Constructi	on								Kap		Area (m²
Internal Stud Walls		Plasterboar	d on timber frame								(kJ/r 9.0		140.29
10.0 External Roofs													
Description	Туре	Construction					Gross Area(m²)	Nett Area (m²)		Shelter Factor		ulation(ype	Opening
External Pitched Roofs	External Plan Roof	e Plasterboard,	insulated at ceiling le	/el 0	.09	9.00	40.70	40.70	None	0.00		culate I Area	0.00
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceilin	ng, carpeted	d chipbo	ard floo	or					Area 40.	
11.0 Heat Loss Floors Description	Туре	Storey Index	Construction				-Value V/m²K)	Shel	ter Code		helter actor	Kappa (kJ/m²K	Area (m
Ground Floor	Ground Floor - So	olid Lowest occupied	Suspended concrete flo	or, carpeted		•	0.11	1	None		0.00	75.00	40.70

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11.2 Internal Floors		0.	_								
Description		Storey Index		struction						Kappa (kJ/m²K)	Area (m²)
Internal Floor			Plas	sterboard ceiling, car	peted chipboard f	loor				9.00	40.70
12.0 Opening Types Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Door New Dwell DG French Doors	Manufacturer Manufacturer	Half Glaze Window	ed Do	oor Double Low-F Double Low-F		Cup	.,,,,	0.36 0.71	.,,,,,	0.70 0.70	1.20 1.20
New Dwelling DG Windov	v Manufacturer	Window		Double Low-l	E Soft 0.05			0.71		0.70	1.20
13.0 Openings											
Name Front South Door Front South Windows Side East Windows Rear North Windows Rear North Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwell D	Entrance Doo g DG Windo g DG Windo g DG Windo	ow ow ow	Location External Cavity Wa	 	Orient Sou Sou Ea Nou Nou	uth uth st rth	Area 2.0 4.1 2.1 3.0 3.3	1 8 6 6	Pit	ch
14.0 Conservatory				None							
15.0 Draught Proofing				100				%			
16.0 Draught Lobby				No							
17.0 Thermal Bridging				Calculate Bridges				\neg			
17.1 List of Bridges				Calculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at of E16 Corner (normal) E18 Party wall between d P1 Party wall - Ground flo P2 Party wall - Intermedia	in a dwelling ceiling level) wellings or	,	Inde Inde Inde Inde Inde Inde Inde	pendently assessed ependently assessed expendently assessed expendently assessed	9.82 1 28.50 1 18.02 1 18.02 1 18.02 1 10.30 1 10.30	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00	d Reference IG or Keys Recognise Recognise Recognise Recognise Recognise Recognise Recognise Recognise Recognise	tone Hi The diconstructed Constructed Cons	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	Imported No
P4 Party wall - Roof (insu				pendently assessed		0.10	0.10	Recognise	d Construc	ction Detail	No
Y-value				0.00				W/m²K			
18.0 Pressure Testing				Yes							
Designed AP ₅₀				5.05				m³/(h.m	n²) @ 50 P	а	
Test Method				Blower Door							
19.0 Mechanical Ventilation											
Mechanical Ventilation											
Mechanical Ventilati	on System Pres	ent		No							
20.0 Fans, Open Fireplaces,	, Flues										
21.0 Fixed Cooling System				No							
22.0 Lighting											
No Fixed Lighting				No							
			Lov	Name w energy Lighting	Efficacy 75.00		wer 15		acity 25		unt 24
24.0 Main Heating 1				Database							
Description				Electric Air Source	Heat Pump			\exists			
Percentage of Heat				100.00	- 17-			<u> </u>			
Database Ref. No.				106465				= "			
Fuel Type				Electricity				=			
In Winter				0.00				\exists			
In Summer				0.00				\dashv			
Model Name				EDLA04EV3				\dashv			
Manufacturer				Daikin Europe NV				\dashv			
System Type				Heat Pump				\dashv			
Controls SAP Code				2207				\dashv			
55515 5, 11 5545											

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PCDF Controls	0						
Is MHS Pumped	Pump in hea	ited space					
Heating Pump Age	2013 or late	•					
Heat Emitter	Radiators				=		
Flow Temperature	Enter value						
					_		
Flow Temperature Value	55.00						
25.0 Main Heating 2	None						
26.0 Heat Networks	None						
Heat Source Fuel Type Heating	g Use Efficie	ncy Percentage Heat	Of Heat	Heat Power Ratio	Electrical	Fuel Factor Efficie	ency type
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5							
28.0 Water Heating							
Water Heating	Main Heatin	g 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						
Cold Water Source	From mains						
Bath Count	1						
Immersion Only Heating Hot Water	No						
28.1 Showers Description Shower T	Гуре		Flow Rate [l/min]	Rated Pow [kW]	er Connect	ed Connected To	
28.3 Waste Water Heat Recovery System							
29.0 Hot Water Cylinder	Hot Water C	ylinder					
Cylinder Stat	Yes						
Cylinder In Heated Space	Yes						
Independent Time Control	Yes						
Insulation Type	Measured L	oss					
Cylinder Volume	180.00				L		
Loss	1.39				kWh/d	ay	
Pipes insulation	Fully insulate	ed primary pipewo	rk		<u> </u>		
In Airing Cupboard	No						
31.0 Thermal Store	None						
Recommendations Lower cost measures None Further measures to achieve even higher standard	is						
	Typical Cost	Typical sa	ings per ye	ar s	Ratings : AP rating	after improvement Environmenta	l Impact
	£4,000 - £6,000 £3,500 - £5,500		£46 1187		B 85 B 91 0	A 97 A 98 0	

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Thermal Bridging



Property Reference	sc100230 P3 Bitterne C	hurch			Issued on Date	06/12/2023
Assessment Reference	001		Prop	Type Ref	End-Terrace House	
Property	Plot 3, Bitterne Parish C	Church, Whites Lane,	Southampton, Ham	oshire , SO19 7N	IP	
SAP Rating		84 B	DER	4.05	TER	11.68
Environmental		97 A	% DER < TER			65.33
CO ₂ Emissions (t/year)		0.27	DFEE	36.04	TFEE	37.96
Compliance Check		See BREL	% DFEE < TFEE			5.06
% DPER < TPER		30.70	DPER	42.30	TPER	61.03
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001
Client	Vivid Design Studio, Philip D	oudley	<u> </u>			

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	10.78	0.54	IG or Keystone Hi Therm
External wall	E3 Sill	Independently assessed	0.018	9.82	0.18	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.50	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	18.02	1.23	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	18.02	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.02	0.99	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.16	0.94	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.16	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.16	0.93	Recognised Construction Detail

Total: 151.24 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121834				Issued on Date	06/12/2023
Assessment Reference	e 001		P	rop Type Ref	New Dwelling Part L	. 2021
Project	Plot 3, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, So	uthampton, H	ampshire, SO19 7N	NP
Calculation Type	New Build (As Designed)					
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00	
CO ₂ Emissions (t/ye	ear)	0.93	DFEE	42.35	TFEE	54.07
General Requireme	ents Compliance	Pass	% DFEE <tfee< th=""><th></th><th>21.66</th><th></th></tfee<>		21.66	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, mark@	surecalc.co.u	ık Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	gn Studio		<u></u>		

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

otal resistance. Opper mint = 11.445 m k/v Lower mint = 11.246 m k/v Average = 11.346 m k/v

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference	sc121834				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 3, Bitterne Parish Ch	urch, Whites L	ane, Bitterne,	Southampton, H	ampshire, SO19 7N	IP
Calculation Type	New Build (As Designed)					
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00	
CO ₂ Emissions (t/yea	r)	0.93	DFEE	42.35	TFEE	54.07
General Requiremen	ts Compliance	Pass	% DFEE <tfi< th=""><th>EE</th><th>21.66</th><th></th></tfi<>	EE	21.66	
Assessor Details M	r. Mark Rogers, Surecalc Lim	ited, Tel: 0124	13572695, ma	rk@surecalc.co.u	ık Assessor ID	A320-0001
Client	vid Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121834				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 3, Bitterne Parish Ch	urch, Whites La	ane, Bitterne, S	Southampton, H	ampshire , SO19 7N	IP.
Calculation Type	New Build (As Designed)					
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00	
CO ₂ Emissions (t/year)		0.93	DFEE	42.35	TFEE	54.07
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>21.66</th><th></th></tfe<>	E	21.66	
Assessor Details Mr.	. Mark Rogers, Surecalc Lim	ited, Tel: 0124	3572695, mar	k@surecalc.co.u	k Assessor ID	A320-0001
Client Viv	id Design Studio, Vivid Desi	gn Studio				

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 40.70 m², Perimeter = 18.02 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners:	None or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W Lo	ower limit = 7.603 m ²	<td>Average =</td> <td>7.656 m² K/</td>	Average =	7.656 m ² K/
	Total correction = 0.0079 m ² K/W	U-value (ւ	ınrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 4, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121835				Issued on Date 0	6/12/2023	
Assessment	001 Prop Type Ref New Dwelling Part L 2021				1		
Reference							
Property	Plot 4, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, Sou	thampton, Ha	ampshire , SO19 7NP		
SAP Rating		88 B	DER	14.11	TER	24.58	
Environmental		90 B	% DER <ter< td=""><td></td><td colspan="3">42.60</td></ter<>		42.60		
CO ₂ Emissions (t/ye	ar)	0.86	DFEE	34.65	TFEE	45.09	
General Requireme	nts Compliance	Pass	% DFEE <tfee< th=""><th></th><th>23.16</th><th></th></tfee<>		23.16		
Assessor Details	Mr. Mark Rogers, Surecalc Limark@surecalc.co.uk	mited, Tel: 012	243572695,		Assessor ID A	320-0001	
Client	Vivid Design Studio, Vivid De	sign Studio					
ENE 1 - Dwelling Emi	ission Rate calculation						
Total floor area				81.4	m²		
DER				14.11	kgCO ₂ /yr/m ²	!	
TER				24.58	kgCO ₂ /yr/m ²		
CO ₂ emissions of	ffset from additional allowable	e electricity ge	neration	0.00	kgCO ₂ /yr/m ²		
	issions offset from biofuel CH			0.00	kgCO ₂ /yr/m ²		
Total CO₂ emissi	ons offset from SAP Section 1	6 allowances		0.00	kgCO ₂ /yr/m ²		
DER accounting f	for SAP Section 16 allowances	}		14.11	kgCO ₂ /yr/m ²		
Reduction DER/T	ΓER			42.60	%		
CfSH ENE1 credit	ts achieved			4.8			
CfSH ENE1 level	achieved			4			
				4			
ENE 2 – Fabric Energ	y Efficiency calculation			7			
ENE 2 – Fabric Energ					id-Terrace		
	y Efficiency calculation				id-Terrace kWh/m²/yr		
Dwelling type	y Efficiency calculation			House, M			
Dwelling type Fabric energy effi CfSH ENE2 credits	y Efficiency calculation			House, M 34.65			
Dwelling type Fabric energy effi CfSH ENE2 credit: CfSH ENE1 and 2	y Efficiency calculation ciency (F.E.E.) s achieved	ation		House, M 34.65 8.1			
Dwelling type Fabric energy effi CfSH ENE2 credit: CfSH ENE1 and 2	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, M 34.65 8.1			
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, M 34.65 8.1			
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, M 34.65 8.1 4	kWh/m²/yr		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ en Total floor area DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, M 34.65 8.1 4	kWh/m²/yr	(ZC2)	
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ en Total floor area DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC2) (ZC3)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ energy Total floor area DER CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking	ation		House, M 34.65 8.1 4 81.4 17.79 16.19	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions fro	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case tot	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17	$kWh/m^2/yr$ m^2 $kgCO_2/yr/m^2$ $kgCO_2/yr/m^2$ $kgCO_2/yr/m^2$ $kgCO_2/yr/m^2$	(ZC3) (ZC4)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case tot Net Standard case	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17 36.17	m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17 36.17	m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions essions om electrical appliances	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17 36.17	m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from Standard case total Net Standard case CO ₂ emissions from DER CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calculumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17 36.17	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from Standard case total Net Standard case CO ₂ emissions from DER CO ₂ emissions from CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking cooking cooking cooking	ation		House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17 36.17 17.66 16.19 2.20	m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)	
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case total CO ₂ emissions from CO ₂ reduction from CO ₂ reduction from Comparison from CO ₂ reduction from Comparison from Comparison from CO ₂ reduction from Comparison from Comparison from Comparison from CO ₂ reduction from Comparison from CO ₂ reduction from Comparison from CO ₂ reduction from CO ₂ reductio	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking com cooking om electrical appliances om additional allowable electrical		n	House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17 17.66 16.19 2.20 36.04 0.00 0.00	kWh/m²/yr m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case total Net Standard case total DER CO2 emissions from CO2 emissions from Actual case CO2 emissions from CO2 emissions from CO2 emissions from CO2 emissions from Actual case total CO2 emissions from Actual case total CO2 reduction from Net Actual case CO2	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking com cooking om electrical appliances om additional allowable electrical	icity generatio	n	House, M 34.65 8.1 4 81.4 17.79 16.19 2.20 36.17 36.17 17.66 16.19 2.20 36.04 0.00	m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)	



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

\sim			



Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:24:01

Project Information				
Assessed By	Mark Rogers	Building Type	House, Mid-terrace	
OCDEA Registration	EES/004179	Assessment Date	2023-12-06	

Dwelling Details			
Assessment Type	As designed	Total Floor Area	81 m ²
Site Reference	sc100231 P4 Bitterne Church	Plot Reference	001
Address	Bitterne Parish Church Plot 4	Whites Lane, Southampton, SO	19 7NP

Client Details		
Name	Philip Dudley	
Company	Vivid Design Studio	
Address	NA, NA, NA	

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

1a Target emission rate and dwelling emission	rate			
Fuel for main heating system	Electricity			
Target carbon dioxide emission rate	10.08 kgCO ₂ /m ²			
Dwelling carbon dioxide emission rate	3.56 kgCO ₂ /m ²	OK		
1b Target primary energy rate and dwelling pri	mary energy			
Target primary energy	52.5 kWh _{PE} /m ²			
Dwelling primary energy	37.3 kWh _{PE} /m ²	OK		
1c Target fabric energy efficiency and dwelling fabric energy efficiency				
Target fabric energy efficiency	30.3 kWh/m²			
Dwelling fabric energy efficiency	28.3 kWh/m ²	OK		

2a Fabric U-values						
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m²K]	Element with highest individual U-Value			
External walls	0.26	0.22	Walls (1) (0.22)	OK		
Party walls	0.2	0	Party Wall (1) (0)	N/A		
Curtain walls	1.6	0	N/A	N/A		
Floors	0.18	0.11	Ground Floor (0.11)	OK		
Roofs	0.16	0.09	Roof (1) (0.09)	OK		
Windows, doors, and roof windows	1.6	1.2	Front South Door (1.2)	OK		
Rooflights	2.2	N/A	N/A	N/A		

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))				
Name	Net area [m ²]	U-Value [W/m ² K]		
Exposed wall: Walls (1)	32.95	0.22		
Party wall: Party Wall (1)	94.34	0 (!)		
Ground floor: Ground Floor, Ground Floor	40.7	0.11		
Exposed roof: Roof (1)	40.7	0.09 (!)		

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]	
Front South Door, New Dwell Entrance	2.01	South	N/A	1.2	
Door					
Front South Windows, New Dwelling	4.18	South	0.7	1.2	
DG Window					
Rear North Windows, New Dwelling DG	3.06	North	0.7	1.2	
Window					
Rear North Windows, New Dwell DG	3.33	North	0.7	1.2	
French Doors					

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²			
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK		
Air permeability test certificate reference				

4 Space heating	
Main heating system 1: Heat pump with	radiators or underfloor heating - Electricity
Efficiency	232.5%
Emitter type	Radiators
Flow temperature	55°C
System type	Heat Pump
Manufacturer	Daikin Europe NV
Model	EDLA04EV3
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	180 litres
Declared heat loss	1.39 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 -	type: N/A
Efficiency	
Manufacturer	
Model	

6 Controls			
Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical se	ervices
Function		·	
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosta	at and HW separately	timed	
Manufacturer			
Model			
7 Lighting	l 		
Minimum permitted light source efficacy	75 lm/W		I
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		14/74
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model	IN/A		IN/A
Commissioning			
Commissioning			
9 Local generation			
N/A			
10 Heat natworks			
10 Heat networks N/A			
IN/A			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration	- Constitution the state of the state	stanta efficie DDEL Occupiones Depart	
		entents of this BREL Compliance Report	
		nformation submitted for this dwelling for	
the purpose of carrying out the "As de			
evidence (SAP Conventions, Appendi			
documentary evidence required) has	been reviewed in the	course of preparing this BREL	
Compliance Report.			
		ļ <u>.</u>	
Signed:		Assessor ID:	
Name:		Date:	
b. Client Declaration			

N/A

Predicted Energy Assessment



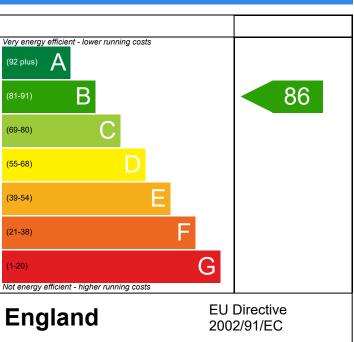
Plot 4, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Mid-Terrace
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 81.4 m²
DRRN: 7207-0026-6915

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.

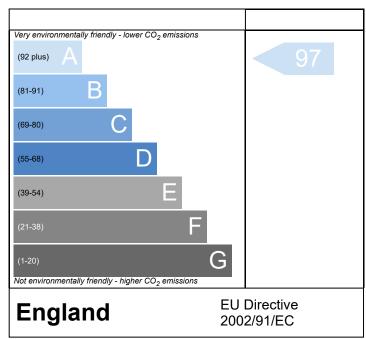
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc1002	31 P4 Bitterne Ch	urch				Issu	ed on Da	ite	06/12/	2023	
Assessment Reference	001			F	rop Typ	e Ref	New D	welling				
Property	Plot 4,	Bitterne Parish Ch	urch, Whites Lane, S	outhampton, Ha	ampshire	, SO19 7N	Р					
SAP Rating			86 B	DER	3	56		TER		10.	08	
Environmental			97 A	% DER < TE						64.		
CO ₂ Emissions (t/year)			0.24	DFEE		3.25		TFEE		30.		
Compliance Check			See BREL	% DFEE < T						6.7		
% DPER < TPER			28.95	DPER	37	'.30		TPER		52.		
Assessor Details	Mr. Marila Da							A 2 2 2 2 2	or ID	40	20.000	
Client	Mr. Mark Ro	n Studio, Philip Du	dlov					Assess	טו וט	A3	20-000	<u> </u>
SUMMARY FOR INPU												
	IDAIAFOR	New Bulla (A										
Orientation			South									
Property Tenture			ND									
Transaction Type			6 Cuburban									
Terrain Type			Suburban House, Mid-Terrace									
1.0 Property Type 2.0 Number of Storeys			House, Mid-Terrace									
3.0 Date Built			2023									
4.0 Sheltered Sides			2									
5.0 Sunlight/Shade			Average or unknown	n								
6.0 Thermal Mass Paramet	ter		Precise calculation	•								
7.0 Electricity Tariff			Standard									
Smart electricity meter fi	tted		No									
Smart gas meter fitted			No									
7.0 Measurements			Ground floo 1st Store		s Perime 34 m 34 m	ter In	ternal F 40.7 40.7		a Av	2	Storey 2.39 m 2.76 m	/ Height
8.0 Living Area			18.06					m²				
9.0 External Walls												
	Type Cavity Wall		ard on dabs or battens, block, filled cavity, any	U-Value Kap (W/m²K) (kJ/m 0.22 110.	· ·²K) Area(ı		Shelter Res 0.00	Shelt Non			7	alculation Type te Wall Are
9.1 Party Walls												
Description	Туре	Construc	tion			U-Value (W/m²K)					She	elter
Party Wall	Filled Cavit Edge Seali		sterboard on dabs bo blocks, cavity or cav	th sides, lightweity fill	eight	0.00	110.00			•	No	ne
9.2 Internal Walls Description		Constructi	on							Kap		rea (m²
Internal Stud Walls		Plasterboar	d on timber frame							(kJ/m 9.0		140.29
10.0 External Roofs												
Description	Туре	Construction				ι Gross ()Area(m²)	Nett Area		Shelter Factor	Calcu Ty)pening
External Pitched Roofs	External Plan	e Plasterboard, i	insulated at ceiling le	-	9.00	40.70	(m²) 40.70	None	0.00	Calci Wall	ulate	0.00
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceilir	ng, carpeted chi	pboard f	oor					Area 40.	
11.0 Heat Loss Floors Description	Туре	Storey Index	Construction			U-Value	Shel	ter Code		helter		Area (m
•						(W/m ² K)			-	actor	(kJ/m ² K)	,

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11.2 Internal Floors Description		Storey	Constr	uction						Kappa	Area (m²
Internal Floor		Index		board ceiling, carpe	ated chiphoard flo	or				(kJ/m²K) 9.00	40.70
			Plaster	board ceiling, carpe	ted chipboard no	OI				9.00	40.70
12.0 Opening Types Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K
New Dwell Entrance Door New Dwell DG French	Manufacturer Manufacturer	Half Glaze Window	ed Door	Double Low-E S Double Low-E S		Cup	Турс	0.36 0.71	Турс	0.70 0.70	1.20 1.20
Doors New Dwelling DG Window	Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
13.0 Openings											
Name Front South Door Front South Windows Rear North Windows Rear North Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwell D	ntrance Do g DG Wind g DG Wind	or Ex ow Ex ow Ex	ocation ternal Cavity Wall ternal Cavity Wall ternal Cavity Wall ternal Cavity Wall		Orienta Sout Sout Nort Nort	th th :h	Area (2.0 4.18 3.00 3.33	1 3 3	Pit	ch
14.0 Conservatory			No	one							
15.0 Draught Proofing			10	0				%			
16.0 Draught Lobby			No)				Ī			
17.0 Thermal Bridging 17.1 List of Bridges			Ca	lculate Bridges							
Bridge Type E2 Other lintels (including of E3 Sill) E4 Jamb E5 Ground floor (normal) E6 Intermediate floor within E10 Eaves (insulation at compared to E18 Party wall between dwell Party wall - Ground flood P2 Party wall - Intermediate	n a dwelling eiling level) vellings or e floor within a e	, dwelling	Indeper Indeper Indeper Indeper Indeper Indeper Indeper Table K	ndently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed	Length 8.74 7.78 22.20 8.84 8.84 20.60 18.32 18.32	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.04 0.10 0.00	0.05 0.02 0.01 0.07 0.00 0.06 0.04 0.10 0.00	Reference: IG or Keyst Recognised Recognised Recognised Recognised Recognised Recognised Recognised	one Hi The I Construct I Construct I Construct I Construct I Construct I Construct I Construct	tion Detail tion Detail tion Detail tion Detail tion Detail tion Detail tion Detail	Importe No No No No No No No
P4 Party wall - Roof (insula Y-value	ation at ceiling i	ever)	0.0	ndently assessed	18.32	0.10	0.10	Recognised W/m²K	Construc	cion Detail	No
18.0 Pressure Testing			Ye	c							
Designed AP ₅₀			5.0					m³/(h m	²) @ 50 Pa	а	
Test Method				ower Door					, @ 55		
19.0 Mechanical Ventilation											
Mechanical Ventilation Mechanical Ventilation	on System Pres	ent	No)							
20.0 Fans, Open Fireplaces,	Flues										
, , , ,	- 1400										
21.0 Fixed Cooling System			No								
			IVC)							
22.0 Lighting											
22.0 Lighting No Fixed Lighting			No		Efficacy 75.00		wer 5	Capa			unt 24
			No Low e	Name							
No Fixed Lighting			No Low e	n Name nergy Lighting	75.00						
No Fixed Lighting 24.0 Main Heating 1			Low e	Name nergy Lighting	75.00						
No Fixed Lighting 24.0 Main Heating 1 Description			Low e	Name nergy Lighting ntabase ectric Air Source He	75.00			112			
No Fixed Lighting 24.0 Main Heating 1 Description Percentage of Heat			Low e	Name nergy Lighting stabase ectric Air Source He	75.00			112			
No Fixed Lighting 24.0 Main Heating 1 Description Percentage of Heat Database Ref. No.			Low en Date In 10 In 10 In	Name nergy Lighting stabase ectric Air Source He 0.00 6465	75.00			112			
No Fixed Lighting 24.0 Main Heating 1 Description Percentage of Heat Database Ref. No. Fuel Type In Winter			Low e Da Ele 10 10 Ele 0.6	Name nergy Lighting stabase ectric Air Source He 0.00 6465 ectricity	75.00			112			
No Fixed Lighting 24.0 Main Heating 1 Description Percentage of Heat Database Ref. No. Fuel Type In Winter In Summer			Low e Da Ele 10 10 Ele 0.6	Name nergy Lighting natabase ectric Air Source He 0.00 6465 ectricity	75.00			112			
No Fixed Lighting 24.0 Main Heating 1 Description Percentage of Heat Database Ref. No. Fuel Type In Winter In Summer Model Name			Note Low en Date Inc. 100 Electron 0.0 Co. E.C. E.C.	Name nergy Lighting stabase ectric Air Source He 0.00 6465 ectricity 00 00 0LA04EV3	75.00			112			
No Fixed Lighting 24.0 Main Heating 1 Description Percentage of Heat Database Ref. No. Fuel Type In Winter In Summer Model Name Manufacturer			Low ellow Ellow 100 Co.	Name nergy Lighting atabase ectric Air Source He 0.00 6465 ectricity 00 0LA04EV3 aikin Europe NV	75.00			112			
No Fixed Lighting 24.0 Main Heating 1 Description Percentage of Heat Database Ref. No. Fuel Type In Winter In Summer Model Name			Note Low en Date L	Name nergy Lighting stabase ectric Air Source He 0.00 6465 ectricity 00 00 0LA04EV3	75.00			112			

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Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None	
Heat Source Fuel Type Heating L	Heat Power	trical Fuel Factor Efficiency type
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5	Ratio	
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	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.1 Showers		
Description Shower Typ	e Flow Rate Rated Power C [l/min] [kW]	onnected Connected To
28.3 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 Type	Measured Loss	
Cylinder Volume	180.00	L
Loss	1.39	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	
31.0 Thermal Store	None	
Recommendations Lower cost measures None Further measures to achieve even higher standards		atings after improvement
£	,000 - £6,000 £46 B 8 ,500 - £5,500 £186 A 9	7 A 97

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Thermal Bridging



Property Reference	sc100231 P4 Bitterne C	Church			Issued on Date	06/12/2023
Assessment Reference	001		Prop	Type Ref	Mid-Terrace House	
Property	Plot 4, Bitterne Parish C	Church, Whites Lane,	Southampton, Hamp	oshire , SO19 7N	IP	
SAP Rating		86 B	DER	3.56	TER	10.08
Environmental		97 A	% DER < TER			64.68
CO ₂ Emissions (t/year)		0.24	DFEE	28.25	TFEE	30.29
Compliance Check		See BREL	% DFEE < TFEE			6.74
% DPER < TPER		28.95	DPER	37.30	TPER	52.50
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001
Client	Vivid Design Studio, Philip D	Oudley	<u> </u>			<u> </u>

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	8.74	0.44	IG or Keystone Hi Therm
External wall	E3 Sill	Independently assessed	0.018	7.78	0.14	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	22.20	0.31	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	8.84	0.60	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	8.84	0.01	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	8.84	0.49	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	20.60	0.91	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	18.32	1.89	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	18.32	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	18.32	1.85	Recognised Construction Detail

Total: 140.80 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121835				Issued on Date	06/12/2023
Assessment Reference	e 001		Pro	p Type Ref	New Dwelling Part L	2021
Project	Plot 4, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, Sout	:hampton, Ha	mpshire , SO19 7N	NP
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	14.11	TER	24.58
Environmental		90 B	% DER <ter< th=""><th></th><th>42.60</th><th></th></ter<>		42.60	
CO ₂ Emissions (t/ye	ear)	0.86	DFEE	34.65	TFEE	45.09
General Requireme	ents Compliance	Pass	% DFEE <tfee< th=""><th></th><th>23.16</th><th></th></tfee<>		23.16	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, mark@s	surecalc.co.uk	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	gn Studio		<u> </u>		

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Total correction = 0.0030 m² K/W

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m ² K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

U-value (unrounded) = 0.09 W/m² K

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference	sc121835				Issued on Date	06/12/2023
Assessment Referenc	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 4, Bitterne Parish Ch	urch, Whites L	ane, Bitterne,	Southampton, H	ampshire , SO19 7N	IP
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	14.11	TER	24.58
Environmental		90 B	% DER <ter< th=""><th></th><th>42.60</th><th></th></ter<>		42.60	
CO ₂ Emissions (t/ye	ar)	0.86	DFEE	34.65	TFEE	45.09
General Requireme	nts Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>23.16</th><th></th></tfe<>	E	23.16	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, mai	rk@surecalc.co.u	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		,	, ,	0.0400	(- /
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121835				Issued on Date	06/12/2023		
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021		
Project	Plot 4, Bitterne Parish Chu	urch, Whites La	ane, Bitterne,	Southampton, H	ampshire , SO19 7N	IP		
Calculation Type	New Build (As Designed)							
SAP Rating		88 B	DER	14.11	TER	24.58		
Environmental		90 B	% DER <ter< th=""><th></th><th>42.60</th><th></th></ter<>		42.60			
CO ₂ Emissions (t/year)		0.86	DFEE	34.65	34.65 TFEE 45.09			
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th colspan="3">23.16</th></tfe<>	E	23.16			
Assessor Details Mr.	Mark Rogers, Surecalc Lim	ited, Tel: 0124	3572695, ma	rk@surecalc.co.u	Surecalc.co.uk Assessor ID A320-0001			
Client Vivi	d Design Studio, Vivid Desi	gn Studio						

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 40.70 m², Perimeter = 18.02 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Laver	Description	Description		Conductivity	Resistance	Fraction
Layer	Description		(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface					0.1700	
Layer 1	Blockwork					
	Main construction		100	0.1900	0.5263	90.91
	Main construction		100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor					
	Main construction		150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fastene	ers: None or				
	plastic					
Layer 3	Screed					
	Main construction		75	1.1500	0.0652	100.00
Int surface					0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W	Lower limit =	7.603 m² l	K/W	Average =	7.656 m ²
	Total correction = 0.0079 m ² K/W		U-value (เ	unrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 5, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121836				Issued on Date	6/12/2023
Assessment	001			Prop Type Ref	New Dwelling Part L 202	21
Reference						
Property	Plot 5, Bitterne Par	ish Church, Whites L	ane, Bitterne, S	outhampton, H	ampshire , SO19 7NP	
SAP Rating		88 B	DER	14.78	TER	26.82
Environmental		89 B	% DER <ter< td=""><td></td><td>44.90</td><td></td></ter<>		44.90	
CO ₂ Emissions (t/ye	ear)	0.92	DFEE	41.65	TFEE	53.26
General Requireme	ents Compliance	Pass	% DFEE <tfee< td=""><td></td><td>21.80</td><td></td></tfee<>		21.80	
Assessor Details	Mr. Mark Rogers, Suremark@surecalc.co.uk	calc Limited, Tel: 012	243572695,		Assessor ID	A320-0001
Client	Vivid Design Studio, Viv	vid Design Studio				
	nission Rate calculation					
Total floor area				81.4	m²	
DER				14.78	kgCO₂/yr/m	2
TER				26.82	kgCO ₂ /yr/m	
	offset from additional allo	owahle electricity ge	neration	0.00	kgCO ₂ /yr/m	
	nissions offset from biofu			0.00	kgCO ₂ /yr/m	
	ions offset from SAP Sec			0.00	kgCO ₂ /yr/m	
	for SAP Section 16 allow			14.78	kgCO ₂ /yr/m	
Reduction DER/				44.90	%	
				5.0		
CfSH ENE1 credi	its achieved			5.0		
CfSH ENE1 cred	its achieved					
CfSH ENE1 cred	its achieved achieved			4	nd-Terrace	
CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ	its achieved achieved gy Efficiency calculation			4	nd-Terrace kWh/m²/yr	
CfSH ENE1 crediction CfSH ENE1 level ENE 2 - Fabric Energon Dwelling type	its achieved achieved gy Efficiency calculation ficiency (F.E.E.)			4 House, Er		
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit	its achieved achieved gy Efficiency calculation ficiency (F.E.E.)			4 House, Er 41.65		
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CfSH ENE1 crediction CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credition CfSH ENE1 and 2 ENE 7 — Low and Zectandard case CO2 eccentric CfSH ENE1 case Cf	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved overall level achieved ro Carbon Technologies	calculation		4 House, Et 41.65 8.1	kWh/m²/yr	
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Ze Standard case CO ₂ e Total floor area DER	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved overall level achieved ro Carbon Technologies			4 House, Et 41.65 8.1 4	kWh/m²/yr	
CfSH ENE1 crediction CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credition CfSH ENE1 and 2 ENE 7 — Low and Ze Standard case CO2 errors Total floor area DER	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved overall level achieved ro Carbon Technologies emissions om electrical appliances			House, En 41.65 8.1 4 81.4 19.55 16.19 2.20	kWh/m²/yr m² kgCO₂/yr/m²	(ZC2)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Ze Total floor area DER CO ₂ emissions from CO ₂ emissions f	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved overall level achieved ro Carbon Technologies emissions om electrical appliances			House, En 41.65 8.1 4 81.4 19.55 16.19	m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zel Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case to	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking			House, En 41.65 8.1 4 81.4 19.55 16.19 2.20	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zes Standard case CO ₂ es Total floor area DER CO ₂ emissions from Standard case to Net Standard case	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking otal CO ₂ emissions se CO ₂ emissions			81.4 19.55 16.19 2.20 37.93	kWh/m²/yr	(ZC2) (ZC3) (ZC4)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zes Standard case CO ₂ es Total floor area DER CO ₂ emissions from Standard case to Net Standard case	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking otal CO ₂ emissions se CO ₂ emissions			81.4 19.55 16.19 2.20 37.93	kWh/m²/yr	(ZC2) (ZC3) (ZC4) (ZC8)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Ze Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case to Net Standard case Actual case CO ₂ emissions DER	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking otal CO ₂ emissions se CO ₂ emissions			81.4 19.55 16.19 2.20 37.93	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Ze Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case to Net Standard case Actual case CO ₂ emissions DER	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking otal CO ₂ emissions se CO ₂ emissions issions om electrical appliances			81.4 19.55 16.19 2.20 37.93 37.93	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8)
CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 crediff CfSH ENE1 and 2 ENE 7 — Low and Ze Total floor area DER CO ₂ emissions from Standard case to Net Standard case to Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from CO ₃ emissions from CO ₄ emissions fr	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking stal CO ₂ emissions see CO ₂ emissions issions om electrical appliances om cooking			81.4 19.55 16.19 2.20 37.93 37.93 18.37 16.19	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC8)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Ze Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case to Net Standard case to Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from Standard case to Net Standard case CO ₂ emissions from CO	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking otal CO ₂ emissions issions om electrical appliances om cooking CO ₂ emissions			81.4 19.55 16.19 2.20 37.93 18.37 16.19 2.20	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC8) (ZC2) (ZC2) (ZC3)
CfSH ENE1 credic CfSH ENE1 level ENE 2 – Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Ze Standard case CO2 e Total floor area DER CO2 emissions from Standard case to Net Standard c	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking otal CO ₂ emissions issions om electrical appliances om cooking CO ₂ emissions		n	81.4 19.55 16.19 2.20 37.93 37.93 18.37 16.19 2.20 36.75	kWh/m²/yr	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC3) (ZC4) (ZC5)
CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zet Cotal floor area DER CO2 emissions from CO2 emissions from Standard case to Net Standard case to Standard case	its achieved achieved gy Efficiency calculation ficiency (F.E.E.) ts achieved coverall level achieved ro Carbon Technologies emissions om electrical appliances om cooking otal CO ₂ emissions issions om electrical appliances om cooking CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om additional allowable	electricity generatio	n	81.4 19.55 16.19 2.20 37.93 37.93 18.37 16.19 2.20 36.75 0.00	kWh/m²/yr m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5) (ZC7)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:25:08

Project Information					
Assessed By	Mark Rogers	Building Type	House, End-terrace		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details			
Assessment Type	As designed	Total Floor Area	81 m ²
Site Reference	sc100232 P5 Bitterne Church	Plot Reference	001
Address	Bitterne Parish Church Plot 5	Whites Lane, Southampton, SO	19 7NP

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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	11.53 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	4.01 kgCO ₂ /m ²	OK
1b Target primary energy rate and dwelling pri	mary energy	
Target primary energy	60.25 kWh _{PE} /m ²	
Dwelling primary energy	41.84 kWh _{PE} /m ²	OK
1c Target fabric energy efficiency and dwelling		
Target fabric energy efficiency	37.3 kWh/m ²	
Dwelling fabric energy efficiency	35.4 kWh/m ²	OK

2a Fabric U-values						
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value			
External walls	0.26	0.22	Walls (1) (0.22)	OK		
Party walls	0.2	0	Party Wall (1) (0)	N/A		
Curtain walls	1.6	0	N/A	N/A		
Floors	0.18	0.11	Ground Floor (0.11)	OK		
Roofs	0.16	0.09	Roof (1) (0.09)	ОК		
Windows, doors,	1.6	1.2	Front South Door (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)	78.06	0.22			
Party wall: Party Wall (1)	47.17	0 (!)			
Ground floor: Ground Floor, Ground Floor	40.7	0.11			
Exposed roof: Roof (1)	40.7	0.09 (!)			

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]	
Front South Door, New Dwell Entrance	2.01	South	N/A	1.2	
Door					
Front South Windows, New Dwelling	4.18	South	0.7	1.2	
DG Window					
Side West Windows, New Dwelling DG	2.16	West	0.7	1.2	
Window					
Rear North Windows, New Dwelling DG	3.06	North	0.7	1.2	
Window					
Rear North Windows, New Dwell DG	3.33	North	0.7	1.2	
French Doors					

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected values are flagged with a subsequent (!))							
Maximum permitted air permeability at 50Pa 8 m³/hm²							
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK					
Air permeability test certificate reference							

4 Space heating							
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity							
Efficiency	232.4%						
Emitter type	Radiators						
Flow temperature	55°C						
System type	Heat Pump						
Manufacturer	Daikin Europe NV						
Model	EDLA04EV3						
Commissioning							
Secondary heating system: N/A							
Fuel	N/A						
Efficiency	N/A						
Commissioning							

5 Hot water						
Cylinder/store - type: Cylinder						
Capacity	180 litres					
Declared heat loss	1.39 kWh/day					
Primary pipework insulated	Yes					
Manufacturer						
Model						
Commissioning						
Waste water heat recovery system 1 -	type: N/A					
Efficiency						
Manufacturer						
Model						

6 Controls			
Main heating 1 - type: Time and temper	ature zone control by	arrangement of plumbing and electrical s	ervices
Function			
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermost	at and HW separately	timed	
Manufacturer			
Model			
7 Lighting			
Minimum permitted light source efficacy	75 lm/W		
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A Maximum permitted specific fan power	N1/A		
	N/A		NI/A
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		
efficiency	N.1/A		1
Heat recovery efficiency	N/A		N/A
Manufacturer/Model			
Commissioning			
9 Local generation			
9 Local generation			
N/A			
N/A 10 Heat networks			
N/A			
N/A 10 Heat networks N/A			
N/A 10 Heat networks N/A 11 Supporting documentary evidence			
N/A 10 Heat networks N/A			
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N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is considered.		ontents of this BREL Compliance Report	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is coare a true and accurate reflection base	ed upon the design ir	nformation submitted for this dwelling for	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is coare a true and accurate reflection bas the purpose of carrying out the "As de	ed upon the design in esigned" assessment	nformation submitted for this dwelling for , and that the supporting documentary	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is coare a true and accurate reflection bas the purpose of carrying out the "As deevidence (SAP Conventions, Appendi	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for and that the supporting documentary idence) schedules the minimum	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is considered a true and accurate reflection bases the purpose of carrying out the "As decevidence (SAP Conventions, Appendix documentary evidence required) has	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for and that the supporting documentary idence) schedules the minimum	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is coare a true and accurate reflection bas the purpose of carrying out the "As deevidence (SAP Conventions, Appendi	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for and that the supporting documentary idence) schedules the minimum	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is considered a true and accurate reflection bases the purpose of carrying out the "As decevidence (SAP Conventions, Appendix documentary evidence required) has	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for and that the supporting documentary idence) schedules the minimum	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is coare a true and accurate reflection base the purpose of carrying out the "As devidence (SAP Conventions, Appendict documentary evidence required) has Compliance Report.	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for , and that the supporting documentary idence) schedules the minimum course of preparing this BREL	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is considered a true and accurate reflection bases the purpose of carrying out the "As decevidence (SAP Conventions, Appendix documentary evidence required) has	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for and that the supporting documentary idence) schedules the minimum	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is coare a true and accurate reflection base the purpose of carrying out the "As devidence (SAP Conventions, Appendict documentary evidence required) has Compliance Report.	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for , and that the supporting documentary idence) schedules the minimum course of preparing this BREL	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is complete a true and accurate reflection bases the purpose of carrying out the "As defended (SAP Conventions, Appended documentary evidence required) has Compliance Report. Signed:	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for and that the supporting documentary idence) schedules the minimum course of preparing this BREL Assessor ID:	
N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is coare a true and accurate reflection base the purpose of carrying out the "As devidence (SAP Conventions, Appendict documentary evidence required) has Compliance Report.	ed upon the design in esigned" assessment ix 1 (documentary ev	nformation submitted for this dwelling for , and that the supporting documentary idence) schedules the minimum course of preparing this BREL	

N/A

Predicted Energy Assessment



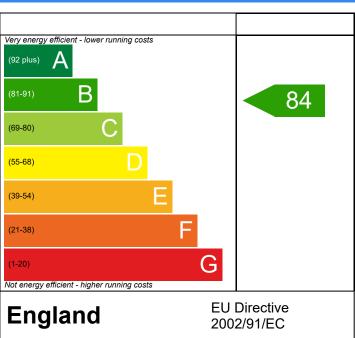
Plot 5, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, End-Terrace
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 81.4 m²
DRRN: 3952-4246-7033

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.

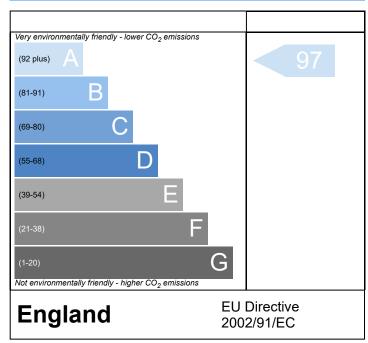
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc1002	32 P5 Bitterne Ch	urch				Issu	ed on Da	ite	06/12/	2023	
Assessment Reference	001			Pı	гор Туре	Ref	New D	welling				
Property	Plot 5,	Bitterne Parish Ch	urch, Whites Lane, S	outhampton, Hai	mpshire	, SO19 7N	Р					
SAP Rating			84 B	DER	4.0)1		TER		11.	53	
Environmental			97 A	% DER < TEF		71				65.		
CO ₂ Emissions (t/year)			0.27	DFEE		.37		TFEE		37.		
Compliance Check			See BREL	% DFEE < TF						5.1		
% DPER < TPER			30.55	DPER	41	.84		TPER		60.		
Assessor Details	Mr. Marila Da							A 2 2 2 2 2	or ID	40	00.000	4
Client	Mr. Mark Ro	n Studio, Philip Du	dlov					Assess	סו זט	A3.	20-000	1
SUMMARY FOR INPU		•										
	IDAIAFOR	New Bulla (A										
Orientation			South									
Property Tenture			ND									
Transaction Type			6 Cubumban									
Terrain Type			Suburban									
1.0 Property Type			House, End-Terrace									
2.0 Number of Storeys 3.0 Date Built			2023									
4.0 Sheltered Sides			2									
5.0 Sunlight/Shade			Average or unknowr	<u> </u>								
6.0 Thermal Mass Paramet	er		Precise calculation									
			Trosled dalicalation									
7.0 Electricity Tariff			Standard									
Smart electricity meter fi	tted		No									
Smart gas meter fitted			No									
7.0 Measurements			Ground floo 1st Store		2 m	er In	ternal F 40.7 40.7		a Av	- 2	Storey 2.39 m 2.76 m	Height
8.0 Living Area			18.06					m²				
9.0 External Walls Description	Туре	Construction		U-Value Kapp	a Gross	Nett Area	Shelter	Shelf	ter O	neninas	Δrea C	alculatio
•	Cavity Wall	Cavity wall; plasterboa	ard on dabs or battens, block, filled cavity, any	(W/m²K) (kJ/m² 0.22 110.00	K) Area(m	1²) (m²)	Res 0.00	Non			7	ype e Wall Are
9.1 Party Walls												
Description	Туре	Construc				U-Value (W/m²K)	(kJ/m²l	ና) (m²)	Re		She	
Party Wall	Filled Cavit Edge Seali		sterboard on dabs bo blocks, cavity or cav		ight	0.00	110.00) 47.1	7		No	ne
9.2 Internal Walls Description		Constructi	on							Кар		rea (m²
Internal Stud Walls		Plasterboar	d on timber frame							(kJ/m 9.0		140.29
10.0 External Roofs												
Description	Туре	Construction				Gross ()Area(m²)			Shelter Factor	Calcu Ty		pening
External Pitched Roofs	External Plan	e Plasterboard, i	nsulated at ceiling lev	/el 0.09	9.00	40.70	(m²) 40.70	None	0.00	Calc Wall		0.00
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceilir	ng, carpeted chip	board flo	oor					Area 40.	
11.0 Heat Loss Floors Description	Туре	Storey Index	Construction			U-Value (W/m²K)	Shel	ter Code		helter actor	Kappa (kJ/m²K)	Area (m

SAP 10 Online 2.12.2 Page 1 of 3



11.2 Internal Floors											
Description		Storey Index		struction						Kappa (kJ/m²K)	Area (m²)
Internal Floor			Plas	sterboard ceiling, car	peted chipboard flo	oor				9.00	40.70
12.0 Opening Types Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Door New Dwell DG French Doors	Manufacturer Manufacturer	Half Glaze Window	ed Do	oor Double Low-E Double Low-E		Cup	iypc	0.36 0.71	Type	0.70 0.70	1.20 1.20
New Dwelling DG Windov	v Manufacturer	Window		Double Low-E	Soft 0.05			0.71		0.70	1.20
13.0 Openings											
Name Front South Door Front South Windows Side West Windows Rear North Windows Rear North Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwell D	Entrance Doo g DG Windo g DG Windo g DG Windo	ow ow ow	Location External Cavity Wal	 	Orienta Sou Sou We Nor Nor	th th st th	Area 2.0 4.1 2.1 3.0 3.3	1 8 6 6	Pit	ch
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				Calculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at of E16 Corner (normal) E18 Party wall between d P1 Party wall - Intermedia P4 Party wall - Roof (insu	in a dwelling ceiling level) wellings or te floor within a	, dwelling	Inde Inde Inde Inde Inde Inde Inde Inde	pendently assessed ependently assessed	10.30 10.30	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	d Reference IG or Keys' Recognise	cone Hi Thid Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	Imported No
Y-value	iduon di coming i	<u> </u>		0.00	0.10	0.10	0.10	W/m²K	2 001101141	Stierr Betair	110
18.0 Pressure Testing				Yes				$\overline{}$			
Designed AP ₅₀				5.05				m ³ /(h m	ı²) @ 50 P	'a	
Test Method				Blower Door					. , @	_	
19.0 Mechanical Ventilation											
Mechanical Ventilation											
Mechanical Ventilati	on System Pres	ent		No							
20.0 Fans, Open Fireplaces,	, Flues										
21.0 Fixed Cooling System				No							
22.0 Lighting											
No Fixed Lighting				No							
			Lov	Name w energy Lighting	Efficacy 75.00		wer 5	Cap a 11	acity 25		unt 24
24.0 Main Heating 1				Database							
Description				Electric Air Source H	Heat Pump						
Percentage of Heat				100.00	г			%			
Database Ref. No.				106465				= -			
Fuel Type				Electricity				\exists			
In Winter				0.00				\exists			
In Summer				0.00				\dashv			
Model Name				EDLA04EV3				\dashv			
Manufacturer				Daikin Europe NV				\dashv			
System Type				Heat Pump				\dashv			
Controls SAP Code				2207				\dashv			
Controls SAP Code				2201							

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PCDF Controls	0						
Is MHS Pumped	Pump in hea	ited space					
Heating Pump Age	2013 or late	•					
Heat Emitter	Radiators				=		
Flow Temperature	Enter value						
					_		
Flow Temperature Value	55.00						
25.0 Main Heating 2	None						
26.0 Heat Networks	None						
Heat Source Fuel Type Heating	g Use Efficie	ncy Percentage Heat	Of Heat	Heat Power Ratio	Electrical	Fuel Factor Efficie	ency type
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5							
28.0 Water Heating							
Water Heating	Main Heatin	g 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						
Cold Water Source	From mains						
Bath Count	1						
Immersion Only Heating Hot Water	No						
28.1 Showers Description Shower T	Гуре		Flow Rate [l/min]	Rated Pow [kW]	er Connect	ed Connected To	
28.3 Waste Water Heat Recovery System							
29.0 Hot Water Cylinder	Hot Water C	ylinder					
Cylinder Stat	Yes						
Cylinder In Heated Space	Yes						
Independent Time Control	Yes						
Insulation Type	Measured L	oss					
Cylinder Volume	180.00				L		
Loss	1.39				kWh/d	ay	
Pipes insulation	Fully insulate	ed primary pipewo	rk		<u> </u>		
In Airing Cupboard	No						
31.0 Thermal Store	None						
Recommendations Lower cost measures None Further measures to achieve even higher standard	is						
	Typical Cost	Typical sa	ings per ye	ar s	Ratings : AP rating	after improvement Environmenta	l Impact
	£4,000 - £6,000 £3,500 - £5,500		£46 1187		B 85 B 91 0	A 97 A 98 0	

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Thermal Bridging



Property Reference	sc100232 P5 Bitterne C	hurch	Issued on Date	06/12/2023				
Assessment Reference	001		Prop	Type Ref	End-Terrace House	nd-Terrace House		
Property	Plot 5, Bitterne Parish C	Church, Whites Lane,	Southampton, Hamր	oshire , SO19 7N	IP			
SAP Rating 84 B			DER	4.01	TER	11.53		
Environmental	rironmental 97 A			DER < TER 65				
CO₂ Emissions (t/year)		0.27	DFEE	35.37	TFEE	37.29		
Compliance Check		See BREL	% DFEE < TFEE			5.16		
% DPER < TPER		30.55	DPER	41.84	TPER	60.25		
Assessor Details	Mr. Mark Rogers	Mr. Mark Rogers Assessor ID A320-0001						
Client	Vivid Design Studio, Philip D	oudley						

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	10.78	0.54	IG or Keystone Hi Therm
External wall	E3 Sill	Independently assessed	0.018	9.82	0.18	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.50	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	18.02	1.23	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	18.02	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.02	0.99	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.16	0.94	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.16	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.16	0.93	Recognised Construction Detail

Total: 151.24 W/mK: Y-Value: 0.00 W/m²K:

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc121836	sc121836						
Assessment Reference	001	Prop Type Ref New Dwelling Part L 2021						
Project	Plot 5, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, Sout	hampton, Har	npshire , SO19 7N	IP.		
Calculation Type	New Build (As Designed)							
SAP Rating		88 B	DER	14.78 TER 26.82				
Environmental		89 B	% DER <ter< th=""><th></th><th>44.90</th><th></th></ter<>		44.90			
CO ₂ Emissions (t/ye	ar)	0.92	DFEE	41.65	TFEE	53.26		
General Requireme	nts Compliance	Pass	% DFEE <tfee< th=""><th></th><th>21.80</th><th></th></tfee<>		21.80			
Assessor Details	. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001							
Client	Vivid Design Studio, Vivid Desi	gn Studio						

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Laver	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m ² K)	(m^2K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
ayer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
ayer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
ayer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1000	

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121836	sc121836							
Assessment Reference	001			Prop Type Ref	New Dwelling Part L 2021				
Project	Plot 5, Bitterne Parish Ch	urch, Whites L	ane, Bitterne,	Southampton, H	ampshire , SO19 7N	IP			
Calculation Type	New Build (As Designed)								
SAP Rating		88 B	DER	14.78	14.78 TER 26.82				
Environmental		89 B	% DER <ter< th=""><th></th><th>44.90</th><th></th></ter<>		44.90				
CO ₂ Emissions (t/ye	ar)	0.92	DFEE	41.65	TFEE	53.26			
General Requireme	eneral Requirements Compliance Pass % DFEE <tfee 21.80<="" th=""></tfee>								
Assessor Details	Mr. Mark Rogers, Surecalc Lim	Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001							
Client	Vivid Design Studio, Vivid Desi	gn Studio							

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		,	, ,	0.0400	(- /
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121836				Issued on Date	06/12/2023	
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021	
Project	Plot 5, Bitterne Parish Ch	Plot 5, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP				IP	
Calculation Type	New Build (As Designed)	New Build (As Designed)					
SAP Rating		88 B	DER	14.78	TER	26.82	
Environmental		89 B	% DER <ter< th=""><th></th><th colspan="3">44.90</th></ter<>		44.90		
CO ₂ Emissions (t/year)		0.92	DFEE	41.65	41.65 TFEE 53.26		
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th colspan="3">21.80</th></tfe<>	E	21.80		
Assessor Details Mr.	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						
Client	id Design Studio, Vivid Desi	gn Studio					

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 40.70 m², Perimeter = 18.02 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None	or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W Lower	limit = 7.603 m ² l	<td>Average =</td> <td>7.656 m² K,</td>	Average =	7.656 m² K,
	Total correction = 0.0079 m ² K/W	U-value (ເ	ınrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 6, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Duran auto Baf	20121027			1	January But	C /42 /2022
Property Reference				on Turno Doc		6/12/2023
Assessment Reference	001		Pr	op Type Ref	New Dwelling Part L 202	.1
Property	Plot 6, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, Sou	ıthampton, H	ampshire , SO19 7NP	
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< td=""><td></td><td>45.00</td><td></td></ter<>		45.00	
CO ₂ Emissions (t/yea	ar)	0.93	DFEE	42.35	TFEE	54.07
General Requiremen	nts Compliance	Pass	% DFEE <tfee< td=""><td></td><td>21.66</td><td></td></tfee<>		21.66	
	Mr. Mark Rogers, Surecalc Li mark@surecalc.co.uk	mited, Tel: 012	243572695,		Assessor ID	\320-0001
Client	Vivid Design Studio, Vivid De	sign Studio			<u> </u>	
ENE 1 - Dwelling Emi	ssion Rate calculation					
Total floor area				81.4	m²	
DER				14.88	kgCO₂/yr/m	2
TER				27.06	kgCO₂/yr/m	2
CO₂ emissions of	fset from additional allowable	e electricity ge	neration	0.00	kgCO₂/yr/m	² (ZC7)
Residual CO₂ emi	issions offset from biofuel CH	Р		0.00	kgCO₂/yr/m	² (ZC5)
Total CO₂ emissio	ons offset from SAP Section 1	6 allowances		0.00	kgCO₂/yr/m	2
DER accounting f	or SAP Section 16 allowances	;		14.88	kgCO ₂ /yr/m	2
Reduction DER/T	ER			45.00	%	
CfSH ENE1 credit	s achieved			5.0		
CfSH ENE1 level a	achieved			4		
ENE 2 – Fabric Energy	y Efficiency calculation					
Dwelling type				-	nd-Terrace	
Fabric energy effic	ciency (F.E.E.)			42.35	kWh/m²/yr	
CfSH ENE2 credits	achieved			7.9		
CfSH ENE1 and 2	overall level achieved			4		
	o Carbon Technologies calcul	ation				
Standard case CO ₂ er	<u>missions</u>					
Total floor area				81.4	m²	
DER				19.74	kgCO₂/yr/m²	
	m electrical appliances			16.19	kgCO₂/yr/m²	
CO ₂ emissions fro	•			2.20 38.12	kgCO₂/yr/m²	
Standard case tot					kgCO₂/yr/m²	
Net Standard case				38.12	kgCO₂/yr/m²	(ZC8)
Actual case CO ₂ emis	SSIONS			10.46	kaco hunhm²	
DER	m electrical appliances			18.46 16.19	kgCO ₂ /yr/m ²	
	m electrical appliances			2.20	kgCO ₂ /yr/m ²	
CO ₂ emissions fro Actual case total (_			36.84	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	
CO₂ emissions fro				0.00	kgCO ₂ /yr/m ²	
	m additional allowable electr	icity generation	n	0.00	kgCO ₂ /yr/m ²	
Net Actual case C		icity generation	11	36.84	kgCO ₂ /yr/m ²	
	o ₂ emissions net actual/net standard case (O emissions		3		(200)
improvement in n	iet actual/liet stallualu case (202 611113310113		3	/0	



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

\sim			



Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:25:56

Project Information					
Assessed By	Mark Rogers	Building Type	House, End-terrace		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details				
Assessment Type	As designed	Total Floor Area	81 m ²	
Site Reference	sc100233 P6 Bitterne Church	Plot Reference	001	
Address Bitterne Parish Church Plot 6 Whites Lane, Southampton, SO19 7NP				

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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	11.68 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	4.05 kgCO ₂ /m ²	OK
1b Target primary energy rate and dwelling pri	mary energy	
Target primary energy	61.03 kWh _{PE} /m ²	
Dwelling primary energy	42.3 kWh _{PE} /m ²	OK
1c Target fabric energy efficiency and dwelling	fabric energy efficiency	
Target fabric energy efficiency	38.0 kWh/m²	
Dwelling fabric energy efficiency	36.0 kWh/m ²	OK

2a Fabric U-values						
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m²K]	Element with highest individual U-Value			
External walls	0.26	0.22	Walls (1) (0.22)	OK		
Party walls	0.2	0	Party Wall (1) (0)	N/A		
Curtain walls	1.6	0	N/A	N/A		
Floors	0.18	0.11	Ground Floor (0.11)	OK		
Roofs	0.16	0.09	Roof (1) (0.09)	OK		
Windows, doors,	1.6	1.2	Front South Door (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)	78.06	0.22			
Party wall: Party Wall (1)	47.17	0 (!)			
Ground floor: Ground Floor, Ground Floor	40.7	0.11			
Exposed roof: Roof (1)	40.7	0.09 (!)			

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]	
Front South Door, New Dwell Entrance	2.01	South	N/A	1.2	
Door					
Front South Windows, New Dwelling	4.18	South	0.7	1.2	
DG Window					
Side East Windows, New Dwelling DG	2.16	East	0.7	1.2	
Window					
Rear North Windows, New Dwelling DG	3.06	North	0.7	1.2	
Window					
Rear North Windows, New Dwell DG	3.33	North	0.7	1.2	
French Doors					

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected values are flagged with a subsequent (!))						
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²					
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK				
Air permeability test certificate reference						

4 Space heating							
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity							
Efficiency	232.5%						
Emitter type	Radiators						
Flow temperature	55°C						
System type	Heat Pump						
Manufacturer	Daikin Europe NV						
Model	EDLA04EV3						
Commissioning							
Secondary heating system: N/A							
Fuel	N/A						
Efficiency	N/A						
Commissioning							

5 Hot water						
Cylinder/store - type: Cylinder						
Capacity	180 litres					
Declared heat loss	1.39 kWh/day					
Primary pipework insulated	Yes					
Manufacturer						
Model						
Commissioning						
Waste water heat recovery system 1 -	type: N/A					
Efficiency						
Manufacturer						
Model						

6 Controls			
Main heating 1 - type: Time and temper	ature zone control by	arrangement of plumbing and electrical s	ervices
Function			
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosts	at and HW separately	timed	
Manufacturer			
Model			
7 Limbian			
7 Lighting	75 Im ///		
Minimum permitted light source efficacy	75 lm/W		OK
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model	·		1.4
Commissioning			
	'		
9 Local generation			
N/A			
10 Heat networks			
N/A			
44.0			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration			
This declaration by the assessor is co	onfirmation that the co	ontents of this BREL Compliance Report	
-		nformation submitted for this dwelling for	
		and that the supporting documentary	
evidence (SAP Conventions, Append			
documentary evidence required) has			
Compliance Report.	boom roviowed in the	course of proparing the BREE	
Compilation Report.			
Signed:		Assessor ID:	
Oignou.		/ 10303301 ID.	
Name:		Date:	
ivaille.		Date.	
h Client Declaration		<u> </u>	

N/A

Predicted Energy Assessment



Plot 6, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, End-Terrace
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 81.4 m²
DRRN: 1346-2092-0170

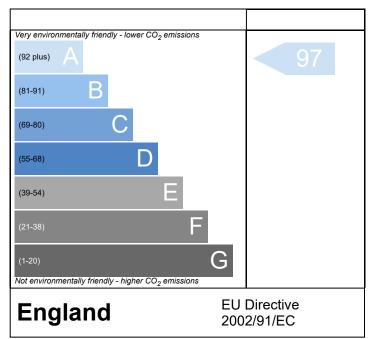
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance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

Energy Efficiency Rating

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

Environmental Impact (CO₂) Rating



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

SAP 10 Online 2.12.2 Page 1 of 1



Assessment Reference Property SAP Rating Environmental CO ₂ Emissions (t/year) Compliance Check % DPER < TPER Assessor Details Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter 7.0 Electricity Tariff	Mr. Mark Rogers Vivid Design Studio	o, Philip Du		DER % DER DFEE % DFEE DPER	, Hamps	Type Ref shire , SO19 4.05 36.04 42.30		TER TFEE TPER Assess	or ID	11.68 65.33 37.96 5.06 61.03	6
SAP Rating Environmental CO ₂ Emissions (t/year) Compliance Check % DPER < TPER Assessor Details Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	Mr. Mark Rogers Vivid Design Studio	o, Philip Du	84 B 97 A 0.27 See BREL 30.70 dley South ND 6 Suburban House, End-Terrace	DER % DER DFEE % DFEE	< TER	36.04	7NP	TFEE TPER	or ID	65.33 37.96 5.06 61.03	3
Environmental CO2 Emissions (t/year) Compliance Check % DPER < TPER Assessor Details Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	Vivid Design Studio	•	97 A 0.27 See BREL 30.70 dley South ND 6 Suburban House, End-Terrace	% DER • DFEE % DFEE		36.04		TFEE TPER	or ID	65.33 37.96 5.06 61.03	3
CO2 Emissions (t/year) Compliance Check % DPER < TPER Assessor Details Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	Vivid Design Studio	•	97 A 0.27 See BREL 30.70 dley South ND 6 Suburban House, End-Terrace	DFEE % DFEE		36.04		TPER	or ID	65.33 37.96 5.06 61.03	3
Compliance Check % DPER < TPER Assessor Details Client SUMMARY FOR INPUT Drientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 5.0 Thermal Mass Parameter	Vivid Design Studio	•	See BREL 30.70 dley S Designed) South ND 6 Suburban House, End-Terrace	% DFEE	< TFEE			TPER	or ID	5.06	3
% DPER < TPER Assessor Details Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	Vivid Design Studio	•	dley South ND Suburban House, End-Terrace		< TFEE	42.30			or ID	5.06	3
Assessor Details Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	Vivid Design Studio	•	South ND 6 Suburban House, End-Terrace	DPER		42.30			or ID	61.03	
Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	Vivid Design Studio	•	South ND 6 Suburban House, End-Terrace					Assess	or ID	A320	1-0001
Client SUMMARY FOR INPUT Orientation Property Tenture Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 1.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	Vivid Design Studio	•	South ND 6 Suburban House, End-Terrace					Assess	טו וט	A320	
SUMMARY FOR INPUT Drientation Property Tenture Transaction Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter		•	South ND 6 Suburban House, End-Terrace								
Orientation Property Tenture Fransaction Type Ferrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter	DAIA FOR: New	V Build (A	South ND 6 Suburban House, End-Terrace								
Property Tenture Fransaction Type Ferrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 1.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter			ND 6 Suburban House, End-Terrace								
Transaction Type Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter			6 Suburban House, End-Terrace								
Terrain Type 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter			Suburban House, End-Terrace								
1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter			House, End-Terrace								
2.0 Number of Storeys 3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter			2								
3.0 Date Built 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter											
4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Thermal Mass Parameter			2023								
5.0 Sunlight/Shade 6.0 Thermal Mass Parameter											
6.0 Thermal Mass Parameter			1								
			Average or unknow	1							
7.0 Electricity Tariff	r		Precise calculation								
			Standard								
Smart electricity meter fitte	ed		No								
Smart gas meter fitted			No								
7.0 Measurements			Ground flo		-oss Per 18.02 m			Floor Area	a Av		torey Hei
			1st Store		18.02 m			'0 m²			76 m
8.0 Living Area			18.06					m²			
9.0 External Walls											
Description Typ External Cavity Wall Car	avity Wall Cavity v lightwei	wall; plasterboa	ard on dabs or battens, block, filled cavity, any	U-Value (W/m²K) (0.22	kJ/m²K) A	Gross Nett Ar rea(m²) (m²) 92.80 78.06	Res	Shelt None			Area Calcula Type alculate Wall
9.1 Party Walls											
Description	Туре	Construct	tion				ue Kapp K) (kJ/m²		Shel Re		Shelter
Party Wall	Filled Cavity with Edge Sealing		sterboard on dabs bo blocks, cavity or cav		htweight					3	None
9.2 Internal Walls Description		Construction	on							Kappa	
Internal Stud Walls	ı	Plasterboar	d on timber frame							(kJ/m²k 9.00	140.
10.0 External Roofs											
Description 1	Type Co	nstruction				appa Gros: /m²K)Area(n			Shelter Factor	Calcula Type	tionOpen
	External Plane Pla Roof	isterboard, i	insulated at ceiling le	vel 0	.09 9	0.00 40.70	(m²) 40.70	None	0.00	Calcula Wall Ar	
10.2 Internal Ceilings Description Internal Ceiling	Store Lowes	y st occupied	Construction Plasterboard ceili	ıg, carpeteo	d chipboa	ard floor				,	Area (m²) 40.70
11.0 Heat Loss Floors Description	Гуре Store	ey Index	Construction			U-Value (W/m²K) 0.11	She	lter Code		actor (k.	appa Area J/m²K) 75.00 40

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11.2 Internal Floors		0.	_								
Description		Storey Index		struction						Kappa (kJ/m²K)	Area (m²)
Internal Floor			Plas	sterboard ceiling, car	peted chipboard f	loor				9.00	40.70
12.0 Opening Types Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Door New Dwell DG French Doors	Manufacturer Manufacturer	Half Glaze Window	ed Do	oor Double Low-F Double Low-F		Cup	.,,,,	0.36 0.71	.,,,,,	0.70 0.70	1.20 1.20
New Dwelling DG Windov	v Manufacturer	Window		Double Low-l	E Soft 0.05			0.71		0.70	1.20
13.0 Openings											
Name Front South Door Front South Windows Side East Windows Rear North Windows Rear North Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwell D	Entrance Doo g DG Windo g DG Windo g DG Windo	ow ow ow	Location External Cavity Wa	 	Orient Sou Sou Ea Nou Nou	uth uth st rth	Area 2.0 4.1 2.1 3.0 3.3	1 8 6 6	Pit	ch
14.0 Conservatory				None							
15.0 Draught Proofing				100				%			
16.0 Draught Lobby				No							
17.0 Thermal Bridging				Calculate Bridges				\neg			
17.1 List of Bridges				Calculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at c E16 Corner (normal) E18 Party wall between d P1 Party wall - Ground flo P2 Party wall - Intermedia	in a dwelling ceiling level) wellings or	,	Inde Inde Inde Inde Inde Inde Inde	pendently assessed ependently assessed expendently assessed expendently assessed	9.82 1 28.50 1 18.02 1 18.02 1 18.02 1 10.30 1 10.30	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00	d Reference IG or Keys Recognise Recognise Recognise Recognise Recognise Recognise Recognise Recognise Recognise	tone Hi The diconstructed Constructed Cons	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	Imported No
P4 Party wall - Roof (insu				pendently assessed		0.10	0.10	Recognise	d Construc	ction Detail	No
Y-value				0.00				W/m²K			
18.0 Pressure Testing				Yes							
Designed AP ₅₀				5.05				m³/(h.m	n²) @ 50 P	а	
Test Method				Blower Door							
19.0 Mechanical Ventilation											
Mechanical Ventilation											
Mechanical Ventilati	on System Pres	ent		No							
20.0 Fans, Open Fireplaces,	, Flues										
21.0 Fixed Cooling System				No							
22.0 Lighting											
No Fixed Lighting				No							
			Lov	Name w energy Lighting	Efficacy 75.00		wer 15		acity 25		unt 24
24.0 Main Heating 1				Database							
Description				Electric Air Source	Heat Pump			\exists			
Percentage of Heat				100.00	- 17-			<u> </u>			
Database Ref. No.				106465				= "			
Fuel Type				Electricity				=			
In Winter				0.00				\exists			
In Summer				0.00				\dashv			
Model Name				EDLA04EV3				\dashv			
Manufacturer				Daikin Europe NV				\dashv			
System Type				Heat Pump				\dashv			
Controls SAP Code				2207				\dashv			
55515 5, 11 5545											

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PCDF Controls	0						
Is MHS Pumped	Pump in hea	ited space					
Heating Pump Age	2013 or late	•					
Heat Emitter	Radiators				=		
Flow Temperature	Enter value						
					_		
Flow Temperature Value	55.00						
25.0 Main Heating 2	None						
26.0 Heat Networks	None						
Heat Source Fuel Type Heating	g Use Efficie	ncy Percentage Heat	Of Heat	Heat Power Ratio	Electrical	Fuel Factor Efficie	ency type
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5							
28.0 Water Heating							
Water Heating	Main Heatin	g 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						
Cold Water Source	From mains						
Bath Count	1						
Immersion Only Heating Hot Water	No						
28.1 Showers Description Shower T	Гуре		Flow Rate [l/min]	Rated Pow [kW]	er Connect	ed Connected To	
28.3 Waste Water Heat Recovery System							
29.0 Hot Water Cylinder	Hot Water C	ylinder					
Cylinder Stat	Yes						
Cylinder In Heated Space	Yes						
Independent Time Control	Yes						
Insulation Type	Measured L	oss					
Cylinder Volume	180.00				L		
Loss	1.39				kWh/d	ay	
Pipes insulation	Fully insulate	ed primary pipewo	rk		<u> </u>		
In Airing Cupboard	No						
31.0 Thermal Store	None						
Recommendations Lower cost measures None Further measures to achieve even higher standard	is						
	Typical Cost	Typical sa	ings per ye	ar s	Ratings : AP rating	after improvement Environmenta	l Impact
	£4,000 - £6,000 £3,500 - £5,500		£46 1187		B 85 B 91 0	A 97 A 98 0	

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Thermal Bridging



Property Reference	sc100233 P6 Bitterne C	hurch	Issued on Date	06/12/2023								
Assessment Reference	001		Prop	Type Ref	End-Terrace House							
Property	Plot 6, Bitterne Parish C	Church, Whites Lane,	oshire , SO19 7	'NP								
SAP Rating		84 B	DER	4.05	TER	11.68						
Environmental		97 A	% DER < TER			65.33						
CO ₂ Emissions (t/year)	0.27	DFEE	36.04	TFEE	37.96							
Compliance Check		See BREL	% DFEE < TFEE			5.06						
% DPER < TPER		30.70	DPER	42.30	TPER	61.03						
Assessor Details	Mr. Mark Rogers Assessor ID A320-0001											
Client	Vivid Design Studio, Philip D	oudley				/ivid Design Studio, Philip Dudley						

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	10.78	0.54	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	9.82	0.18	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.50	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	18.02	1.23	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	18.02	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.02	0.99	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.16	0.94	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.16	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.16	0.93	Recognised Construction Detail

Total: 151.24 W/mK: Y-Value: 0.00 W/m²K:

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc121837	sc121837 Issued on Date 06/12						
Assessment Reference	e 001	001 Prop Type Ref New Dwelling Part L 2021						
Project	Plot 6, Bitterne Parish Ch	lot 6, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP						
Calculation Type	New Build (As Designed)	New Build (As Designed)						
SAP Rating 87 B DER 14.88 TER					27.06			
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00			
CO ₂ Emissions (t/ye	ear)	0.93	DFEE	42.35	TFEE	54.07		
General Requireme	ments Compliance Pass % DFEE <tfee 21.66<="" th=""></tfee>							
Assessor Details	Mr. Mark Rogers, Surecalc Lim	r. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						
Client	Vivid Design Studio, Vivid Desi	gn Studio						

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total correction = 0.0030 m² K/W U-value (unrounded) = 0.09 W/m² K

O-value (unrounded) = 0.003 m ky w

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference	sc121837 Issued on Date 06/						
Assessment Reference	O01 Prop Type Ref New Dwelling Part L 2021						
Project	Plot 6, Bitterne Parish Ch	lot 6, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP					
Calculation Type	New Build (As Designed)	ew Build (As Designed)					
SAP Rating 87 B DER 14.88 TER						27.06	
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00		
CO ₂ Emissions (t/year)		0.93	DFEE	42.35	TFEE	54.07	
General Requirements	eneral Requirements Compliance Pass % DFEE <tfee 21.66<="" th=""></tfee>						
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001							
Client	id Design Studio, Vivid Desi	gn Studio					

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		()	(,	0.0400	(, -)
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties,	125	0.0340	3.6765	100.00
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 5	Plasterboard, standard				
Layer 3	Main construction	12.5	0.2100	0.0595	100.00
Int surface	With Construction	12.5	0.2100	0.1300	100.00

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121837				Issued on Date	06/12/2023
Assessment Reference	001	001 Prop Type R			New Dwelling Part L	2021
Project	Plot 6, Bitterne Parish Ch	Plot 6, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP				
Calculation Type	New Build (As Designed)					
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00	
CO ₂ Emissions (t/year)		0.93	DFEE	42.35 TFEE 54.07		
General Requirements	ats Compliance Pass % DFEE <tfee 21.66<="" th=""><th></th></tfee>					
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						
Client	id Design Studio, Vivid Desi	gn Studio				

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 40.70 m², Perimeter = 18.02 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description		Conductivity		
Fut sunface	•	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None o	r			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W Lower lin	nit = 7.603 m ² l	<td>Average =</td> <td>7.656 m² k</td>	Average =	7.656 m² k
	Total correction = 0.0079 m ² K/W	U-value (ເ	ınrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 7, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121838				Issued on Date	06/12/2023
Assessment	001		Pr	op Type Ref	New Dwelling Part L 202	
Reference						
Property	Plot 7, Bitterne Parish Chu	urch, Whites L	ane, Bitterne, Sou	ithampton, H	ampshire , SO19 7NP	
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< td=""><td></td><td>45.00</td><td></td></ter<>		45.00	
CO ₂ Emissions (t/year)		0.93	DFEE	42.35	TFEE	54.07
General Requirements	Compliance	Pass	% DFEE <tfee< td=""><td></td><td>21.66</td><td></td></tfee<>		21.66	
	. Mark Rogers, Surecalc Lir irk@surecalc.co.uk	mited, Tel: 012	243572695,		Assessor ID	A320-0001
Client	rid Design Studio, Vivid Des	ign Studio				
ENE 1 - Dwelling Emission	on Rate calculation					
Total floor area				81.4	m²	
DER				14.88	kgCO₂/yr/m	2
TER				27.06	kgCO₂/yr/m	2
CO₂ emissions offset	t from additional allowable	electricity ge	neration	0.00	kgCO₂/yr/m	² (ZC7)
Residual CO₂ emissio	ons offset from biofuel CHF			0.00	kgCO₂/yr/m	² (ZC5)
Total CO₂ emissions	offset from SAP Section 16	allowances		0.00	kgCO₂/yr/m	2
DER accounting for S	SAP Section 16 allowances			14.88	kgCO₂/yr/m	2
Reduction DER/TER				45.00	%	
CfSH ENE1 credits ac	chieved			5.0		
CfSH ENE1 level achi	ieved			4		
CfSH ENE1 level achi ENE 2 – Fabric Energy Ef				4		
					nd-Terrace	
ENE 2 – Fabric Energy Ef	ficiency calculation				nd-Terrace kWh/m²/yr	
ENE 2 – Fabric Energy Ef	ficiency calculation			House, Er		
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficien	ficiency calculation ncy (F.E.E.) hieved			House, Er		
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficien CfSH ENE2 credits act CfSH ENE1 and 2 over	ficiency calculation ncy (F.E.E.) hieved	ation		House, Er 42.35 7.9		
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficien CfSH ENE2 credits act CfSH ENE1 and 2 over	ficiency calculation ncy (F.E.E.) hieved rall level achieved arbon Technologies calcula	ation		House, Er 42.35 7.9		
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficien CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca	ficiency calculation ncy (F.E.E.) hieved rall level achieved arbon Technologies calcula	ation		House, Er 42.35 7.9		
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 ove ENE 7 – Low and Zero Castandard case CO ₂ emiss	ficiency calculation ncy (F.E.E.) hieved rall level achieved arbon Technologies calcula	ation		House, Er 42.35 7.9	kWh/m²/yr	
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Cat Standard case CO ₂ emiss Total floor area	fficiency calculation ncy (F.E.E.) hieved rall level achieved arbon Technologies calcula	ation		House, Er 42.35 7.9 4	kWh/m²/yr	
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER	ficiency calculation ficy (F.E.E.) hieved rall level achieved arbon Technologies calculations	ation		House, Er 42.35 7.9 4 81.4 19.74	kWh/m²/yr m² kgCO₂/yr/m²	(ZC2)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from e	fficiency calculation acy (F.E.E.) hieved rall level achieved arbon Technologies calculations electrical appliances cooking	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19	m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 ove ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from eact CO ₂ emissions from eact	ficiency calculation ficy (F.E.E.) hieved arall level achieved arbon Technologies calculations electrical appliances cooking CO ₂ emissions	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from eact CO ₂ emissions from co Standard case total Co	fficiency calculation ficy (F.E.E.) hieved frall level achieved arbon Technologies calculations electrical appliances cooking CO ₂ emissions O ₂ emissions	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from ea CO ₂ emissions from co Standard case total Co Net Standard case CO	fficiency calculation ficy (F.E.E.) hieved frall level achieved arbon Technologies calculations electrical appliances cooking CO ₂ emissions O ₂ emissions	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from e CO ₂ emissions from co Standard case total Co Net Standard case CO ₂ emissions	ficiency calculation ficy (F.E.E.) hieved firall level achieved firall sions electrical appliances cooking CO ₂ emissions D ₂ emissions ns	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12	m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 ove ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from e CO ₂ emissions from c Standard case total C Net Standard case CO ₂ emission DER	ficiency calculation ficy (F.E.E.) hieved rall level achieved arbon Technologies calculations electrical appliances cooking CO ₂ emissions O ₂ emissions ns electrical appliances	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from e CO ₂ emissions from co Standard case total Co Net Standard case CO ₂ Actual case CO ₂ emission DER CO ₂ emissions from e	ficiency calculation ficy (F.E.E.) hieved firall level achieved firall level achieved	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC2)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 ove ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from act Standard case total Co Net Standard case CO ₂ emission DER CO ₂ emissions from act Standard case CO ₂ emission DER CO ₂ emissions from act DER CO ₂ emissions from act CO ₃ emissions from act CO ₄ emissions from act CO ₄ emissions from act CO ₅ emissions from act CO ₆ emissions from act CO ₇ emissions from act CO ₈ emissions from act CO ₈ emissions from act CO ₉ emissions	ficiency calculation ficy (F.E.E.) hieved rall level achieved arbon Technologies calculations electrical appliances cooking CO ₂ emissions D ₂ emissions ns electrical appliances cooking electrical appliances	ation		House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12 18.46 16.19 2.20	m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits act CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from act Standard case total Co Net Standard case CO ₂ emission DER CO ₂ emissions from act Standard case CO ₂ emission Actual case CO ₂ emissions from act CO ₂ emissions from act CO ₂ emissions from act Actual case total CO ₂ CO ₂ emissions from act Actual case total CO ₂ CO ₂ emissions from act CO ₃ emissions	ficiency calculation ficy (F.E.E.) hieved rall level achieved arbon Technologies calculations electrical appliances cooking CO ₂ emissions D ₂ emissions ns electrical appliances cooking electrical appliances		n	House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 18.46 16.19 2.20 36.84	m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)
ENE 2 – Fabric Energy Eff Dwelling type Fabric energy efficient CfSH ENE2 credits ach CfSH ENE1 and 2 over ENE 7 – Low and Zero Ca Standard case CO ₂ emiss Total floor area DER CO ₂ emissions from ach Standard case total Co Net Standard case total Co Net Standard case CO ₂ emission DER CO ₂ emissions from ach CO ₂ emissions from ach Actual case CO ₂ emissions from ach Actual case total CO ₂ CO ₂ emissions from ach Actual case total CO ₂ CO ₂ emissions from Be	ficiency calculation ficy (F.E.E.) hieved rall level achieved arbon Technologies calculations electrical appliances cooking CO ₂ emissions D ₂ emissions ns electrical appliances cooking defectrical appliances achieved arbon Technologies calculations electrical appliances cooking defectrical appliances		n	House, Er 42.35 7.9 4 81.4 19.74 16.19 2.20 38.12 38.12 18.46 16.19 2.20 36.84 0.00	m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5) (ZC7)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

\sim			



Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:26:39

Project Information					
Assessed By	Mark Rogers	Building Type	House, End-terrace		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details			
Assessment Type	As designed	Total Floor Area	81 m ²
Site Reference	sc100234 P7 Bitterne Church	Plot Reference	001
Address	Bitterne Parish Church Plot 7	Whites Lane, Southampton, SO	19 7NP

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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	11.68 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	4.05 kgCO ₂ /m ²	OK
1b Target primary energy rate and dwelling pri	mary energy	
Target primary energy	61.03 kWh _{PE} /m ²	
Dwelling primary energy	42.3 kWh _{PE} /m ²	OK
1c Target fabric energy efficiency and dwelling	fabric energy efficiency	
Target fabric energy efficiency	38.0 kWh/m²	
Dwelling fabric energy efficiency	36.0 kWh/m ²	OK

2a Fabric U-values					
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m²K]	Element with highest individual U-Value		
External walls	0.26	0.22	Walls (1) (0.22)	OK	
Party walls	0.2	0	Party Wall (1) (0)	N/A	
Curtain walls	1.6	0	N/A	N/A	
Floors	0.18	0.11	Ground Floor (0.11)	OK	
Roofs	0.16	0.09	Roof (1) (0.09)	OK	
Windows, doors,	1.6	1.2	Front South Door (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)	78.06	0.22		
Party wall: Party Wall (1)	47.17	0 (!)		
Ground floor: Ground Floor, Ground Floor	40.7	0.11		
Exposed roof: Roof (1)	40.7	0.09 (!)		

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]	
Front South Door, New Dwell Entrance	2.01	South	N/A	1.2	
Door					
Front South Windows, New Dwelling	4.18	South	0.7	1.2	
DG Window					
Side West Windows, New Dwelling DG	2.16	West	0.7	1.2	
Window					
Rear North Windows, New Dwelling DG	3.06	North	0.7	1.2	
Window					
Rear North Windows, New Dwell DG	3.33	North	0.7	1.2	
French Doors					

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected	values are flagged with a subsequent (!))	
Maximum permitted air permeability at 50Pa	8 m³/hm²	
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Heat pump with	radiators or underfloor heating - Electricity
Efficiency	232.5%
Emitter type	Radiators
Flow temperature	55°C
System type	Heat Pump
Manufacturer	Daikin Europe NV
Model	EDLA04EV3
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	180 litres
Declared heat loss	1.39 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 -	type: N/A
Efficiency	
Manufacturer	
Model	

6 Controls			
Main heating 1 - type: Time and temper	ature zone control by	arrangement of plumbing and electrical s	ervices
Function			
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosts	at and HW separately	timed	
Manufacturer			
Model			
7 Limbian			
7 Lighting	75 Im ///		
Minimum permitted light source efficacy	75 lm/W		OK
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model	·		1
Commissioning			
	'		
9 Local generation			
N/A			
10 Heat networks			
N/A			
44.0			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration			
This declaration by the assessor is co	onfirmation that the co	ontents of this BREL Compliance Report	
-		nformation submitted for this dwelling for	
		and that the supporting documentary	
evidence (SAP Conventions, Append			
documentary evidence required) has			
Compliance Report.	boom roviowed in the	course of proparing the BREE	
Compilation Report.			
Signed:		Assessor ID:	
Oignou.		/ 10303301 ID.	
Name:		Date:	
ivaille.		Date.	
h Client Declaration		<u> </u>	

N/A

Predicted Energy Assessment



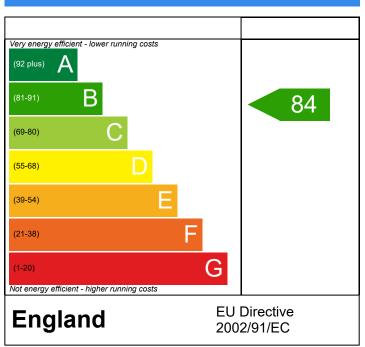
Plot 7, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, End-Terrace
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 81.4 m²
DRRN: 0207-3520-6991

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.

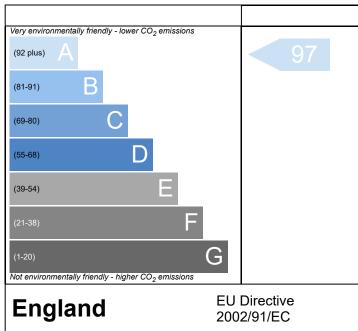
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc1002	234 P7 Bitterne Ch	urch					Issu	ed on Da	ate	06/12	2/2023	
Assessment Reference	001				Prop	Туре	Ref	New D	welling				
Property	Plot 7,	Bitterne Parish Ch	urch, Whites Lane, S	outhampton	n, Hamp	shire ,	SO19 7N	P					
SAP Rating			84 B	DER		4.0			TER		11	.68	
Environmental			97 A	% DER <	TER	4.03)		ILIX			5.33	
CO ₂ Emissions (t/year)			0.27	DFEE		36.0	14		TFEE			7.96	
Compliance Check			See BREL	% DFEE	< TFEE		, i				5.0		
% DPER < TPER			30.70	DPER		42.3	30		TPER			.03	
Assessor Details	Mr. Mark Ro								Assess	sor ID	A3	320-000	1
Client		n Studio, Philip Du											
SUMMARY FOR INPU	T DATA FOR	R: New Build (A	ls Designed)										
Orientation			South										
Property Tenture			ND										
Transaction Type			6										
Terrain Type			Suburban										
1.0 Property Type			House, End-Terrace										
2.0 Number of Storeys			2										
3.0 Date Built			2023										
4.0 Sheltered Sides			1										
5.0 Sunlight/Shade			Average or unknown	1									
6.0 Thermal Mass Paramet	ter		Precise calculation										
7.0 Electricity Tariff			Standard										
Smart electricity meter fi	tted		No										
Smart gas meter fitted			No										
7.0 Measurements			Ground floo 1st Store	or:	oss Pe 18.02 n 18.02 n	n	r In	ternal F 40.79 40.79		a Av	_	2.39 m 2.76 m	
8.0 Living Area			18.06						m²				
	Type Cavity Wall		ard on dabs or battens, block, filled cavity, any	U-Value (W/m²K) (I 0.22			Nett Area (m²) 78.06	Shelter Res 0.00	Shel t Non				Calculatior Type te Wall Are
9.1 Party Walls													
Description	Туре	Construc	tion				U-Value (W/m²K)					She	elter
Party Wall	Filled Cavi Edge Seali		sterboard on dabs bo blocks, cavity or cav		htweigh	t	0.00	110.00			_	No	one
9.2 Internal Walls Description		Constructi	on								Kap		Area (m²
Internal Stud Walls		Plasterboar	d on timber frame								(kJ/r 9.0		140.29
10.0 External Roofs													
Description	Туре	Construction					Gross Area(m²)	Nett Area		Shelter Factor		ulation(ype	Opening
External Pitched Roofs	External Plan Roof	e Plasterboard, i	insulated at ceiling lev	/el 0.	.09	9.00	40.70	(m ²) 40.70	None	0.00		culate I Area	0.00
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceilir	ng, carpeted	I chipbo	ard floo	or					Area 40.	
11.0 Heat Loss Floors Description	Туре	Storey Index	Construction				-Value V/m²K)	Shel	ter Code	F	helter actor	(kJ/m ² K	
Ground Floor	Ground Floor - So	olid Lowest occupied	Suspended concrete flo	or, carpeted		•	0.11	1	None		0.00	75.00	40.70

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11.2 Internal Floors											
Description		Storey Index		struction						Kappa (kJ/m²K)	Area (m²)
Internal Floor			Plas	sterboard ceiling, car	peted chipboard flo	oor				9.00	40.70
12.0 Opening Types Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Door New Dwell DG French Doors	Manufacturer Manufacturer	Half Glaze Window	ed Do	oor Double Low-E Double Low-E		Cup	iypc	0.36 0.71	Type	0.70 0.70	1.20 1.20
New Dwelling DG Windov	v Manufacturer	Window		Double Low-E	Soft 0.05			0.71		0.70	1.20
13.0 Openings											
Name Front South Door Front South Windows Side West Windows Rear North Windows Rear North Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwell D	Entrance Doo g DG Windo g DG Windo g DG Windo	ow ow ow	Location External Cavity Wal	 	Orienta Sou Sou We Nor Nor	th th st th	Area 2.0 4.1 2.1 3.0 3.3	1 8 6 6	Pit	ch
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				Calculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at of E16 Corner (normal) E18 Party wall between d P1 Party wall - Intermedia P4 Party wall - Roof (insu	in a dwelling ceiling level) wellings or te floor within a	, dwelling	Inde Inde Inde Inde Inde Inde Inde Inde	pendently assessed ependently assessed	10.30 10.30	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	d Reference IG or Keys' Recognise	cone Hi Thid Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	Imported No
Y-value	iduon di coming i	<u> </u>		0.00	0.10	0.10	0.10	W/m²K	2 001101141	Stierr Betair	110
18.0 Pressure Testing				Yes				$\overline{}$			
Designed AP ₅₀				5.05				m ³ /(h m	ı²) @ 50 P	'a	
Test Method				Blower Door					. , @	_	
19.0 Mechanical Ventilation											
Mechanical Ventilation											
Mechanical Ventilati	on System Pres	ent		No							
20.0 Fans, Open Fireplaces,	, Flues										
21.0 Fixed Cooling System				No							
22.0 Lighting											
No Fixed Lighting				No							
			Lov	Name w energy Lighting	Efficacy 75.00		wer 5	Cap a 11	acity 25		unt 24
24.0 Main Heating 1				Database							
Description				Electric Air Source H	Heat Pump						
Percentage of Heat				100.00	г			%			
Database Ref. No.				106465				= -			
Fuel Type				Electricity				\exists			
In Winter				0.00				\exists			
In Summer				0.00				\dashv			
Model Name				EDLA04EV3				\dashv			
Manufacturer				Daikin Europe NV				\dashv			
System Type				Heat Pump				\dashv			
Controls SAP Code				2207				\dashv			
Controls SAP Code				2201							

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PCDF Controls	0						
Is MHS Pumped	Pump in hea	ited space					
Heating Pump Age	2013 or late	•					
Heat Emitter	Radiators				=		
Flow Temperature	Enter value						
					_		
Flow Temperature Value	55.00						
25.0 Main Heating 2	None						
26.0 Heat Networks	None						
Heat Source Fuel Type Heating	g Use Efficie	ncy Percentage Heat	Of Heat	Heat Power Ratio	Electrical	Fuel Factor Efficie	ency type
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5							
28.0 Water Heating							
Water Heating	Main Heatin	g 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						
Cold Water Source	From mains						
Bath Count	1						
Immersion Only Heating Hot Water	No						
28.1 Showers Description Shower T	Гуре		Flow Rate [l/min]	Rated Pow [kW]	er Connect	ed Connected To	
28.3 Waste Water Heat Recovery System							
29.0 Hot Water Cylinder	Hot Water C	ylinder					
Cylinder Stat	Yes						
Cylinder In Heated Space	Yes						
Independent Time Control	Yes						
Insulation Type	Measured L	oss					
Cylinder Volume	180.00				L		
Loss	1.39				kWh/d	ay	
Pipes insulation	Fully insulate	ed primary pipewo	rk		<u> </u>		
In Airing Cupboard	No						
31.0 Thermal Store	None						
Recommendations Lower cost measures None Further measures to achieve even higher standard	is						
	Typical Cost	Typical sa	ings per ye	ar s	Ratings : AP rating	after improvement Environmenta	l Impact
	£4,000 - £6,000 £3,500 - £5,500		£46 1187		B 85 B 91 0	A 97 A 98 0	

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Thermal Bridging



Property Reference	sc100234 P7 Bitterne C	hurch			Issued on Date	06/12/2023
Assessment Reference	001		Prop	Type Ref	End-Terrace House	
Property	Plot 7, Bitterne Parish C	Church, Whites Lane,	Southampton, Ham	oshire , SO19 7	NP	
SAP Rating		84 B	DER	4.05	TER	11.68
Environmental		97 A	% DER < TER			65.33
CO ₂ Emissions (t/year)		0.27	DFEE	36.04	TFEE	37.96
Compliance Check		See BREL	% DFEE < TFEE			5.06
% DPER < TPER		30.70	DPER	42.30	TPER	61.03
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001
Client	Vivid Design Studio, Philip D	oudley				

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	10.78	0.54	IG or Keystone Hi Therm
External wall	E3 Sill	Independently assessed	0.018	9.82	0.18	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.50	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	18.02	1.23	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	18.02	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.02	0.99	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.16	0.94	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.16	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.16	0.93	Recognised Construction Detail

Total: 151.24 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121838				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 7, Bitterne Parish Ch	urch, Whites L	ane, Bitterne,	Southampton, H	ampshire, SO19 7	NP.
Calculation Type	New Build (As Designed)					
SAP Rating		87 B	DER	14.88	TER	27.06
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00	
CO ₂ Emissions (t/yea	r)	0.93	DFEE	42.35	TFEE	54.07
General Requiremen	ts Compliance	Pass	% DFEE <tf< th=""><th>E</th><th>21.66</th><th></th></tf<>	E	21.66	
Assessor Details N	1r. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, ma	rk@surecalc.co.u	ık Assessor ID	A320-0001
Client	ivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

tarresistance. Opper mint = 11.445 m ky w Lower mint = 11.246 m ky w

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121838	sc121838			Issued on Date	06/12/2023	
Assessment Reference	001	001 Prop Type Ref New Dwelling Part L 2021					
Project	Plot 7, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, S	Southampton, H	ampshire , SO19 7N	IP.	
Calculation Type	New Build (As Designed)						
SAP Rating		87 B	DER	14.88	TER	27.06	
Environmental		89 B	% DER <ter< th=""><th></th><th>45.00</th><th></th></ter<>		45.00		
CO ₂ Emissions (t/ye	ar)	0.93	DFEE	42.35	TFEE	54.07	
General Requireme	nts Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th colspan="3">21.66</th></tfe<>	E	21.66		
Assessor Details	Mr. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, mar	k@surecalc.co.u	k Assessor ID	A320-0001	
Client	Vivid Design Studio, Vivid Desi	gn Studio					

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121838				Issued on Date	06/12/2023	
Assessment Reference	001 Prop Type Ref New Dwelling Part L 2021				2021		
Project	Plot 7, Bitterne Parish Chi	urch, Whites La	ane, Bitterne,	Southampton, H	ampshire , SO19 7N	IP.	
Calculation Type	New Build (As Designed)						
SAP Rating		87 B	DER	14.88	TER	27.06	
Environmental		89 B	% DER <ter< th=""><th></th><th colspan="3">45.00</th></ter<>		45.00		
CO ₂ Emissions (t/year)		0.93	DFEE	42.35	TFEE	54.07	
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th colspan="3">21.66</th></tfe<>	E	21.66		
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001					A320-0001		
Client Vivi	d Design Studio, Vivid Desi	gn Studio					

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 40.70 m², Perimeter = 18.02 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction Corrections - Air Gap: Level 1, Fasteners: None or plastic	150	0.0220	6.8182	100.00
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total resistance: Upper limit = 7.709 m² K/W Lower limit = 7.603 m² K/W Average = 7.656 m² K/W

Total correction = $0.0079 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.11 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 8, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121839				Issued on Date 0	6/12/2023
Assessment	001		Pr	op Type Ref	New Dwelling Part L 202	21
Reference						
Property	Plot 8, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, Sou	thampton, Ha	ampshire , SO19 7NP	
SAP Rating		88 B	DER	13.52	TER	25.39
Environmental		89 B	% DER <ter< td=""><td></td><td>46.75</td><td></td></ter<>		46.75	
CO ₂ Emissions (t/yes	ar)	1.02	DFEE	41.82	TFEE	53.06
General Requiremen	nts Compliance	Pass	% DFEE <tfee< td=""><td></td><td>21.19</td><td></td></tfee<>		21.19	
Assessor Details	Mr. Mark Rogers, Surecalc Li mark@surecalc.co.uk	mited, Tel: 012	243572695,		Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid De	sign Studio				
ENE 1 - Dwelling Emi	ssion Rate calculation					
Total floor area				97.6	m²	
DER				13.52	kgCO₂/yr/m	2
TER				25.39	kgCO₂/yr/m	
CO₂ emissions of	fset from additional allowable	e electricity ge	neration	0.00	kgCO₂/yr/m	
Residual CO₂ emi	issions offset from biofuel CH	Р		0.00	kgCO₂/yr/m	
Total CO₂ emissio	ons offset from SAP Section 1	6 allowances		0.00	kgCO₂/yr/m	
DER accounting f	for SAP Section 16 allowances	;		13.52	kgCO₂/yr/m	
Reduction DER/T	ER			46.75	%	
CfSH ENE1 credit	s achieved			5.2		
CfSH ENE1 level a	achieved			4		
				7		
	y Efficiency calculation			-		
					mi-Detached	
ENE 2 – Fabric Energ	y Efficiency calculation				mi-Detached kWh/m²/yr	
ENE 2 – Fabric Energe Dwelling type	y Efficiency calculation ciency (F.E.E.)			House, Se		
Dwelling type Fabric energy effice CfSH ENE2 credits	y Efficiency calculation ciency (F.E.E.)			House, Se		
Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2	y Efficiency calculation ciency (F.E.E.) s achieved	ation		House, Se 41.82 8.0		
Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, Se 41.82 8.0		
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 centers ENE 7 – Low and Zero	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, Se 41.82 8.0		
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO2 en	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, Se 41.82 8.0 4	kWh/m²/yr	
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 center ENE 7 - Low and Zero Standard case CO2 en Total floor area DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, Se 41.82 8.0 4	kWh/m²/yr	
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 center ENE 7 - Low and Zero Standard case CO2 en Total floor area DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions	ation		House, Se 41.82 8.0 4 97.6 18.84	kWh/m²/yr m² kgCO₂/yr/m²	(ZC2)
ENE 2 – Fabric Energy Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO ₂ en Total floor area DER CO ₂ emissions fro	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32	m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3)
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 center ENE 7 - Low and Zero Standard case CO ₂ en Total floor area DER CO ₂ emissions fro	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking cal CO ₂ emissions	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO ₂ en Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO ₂ en Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot Net Standard case	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO ₂ en Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot Net Standard case Actual case CO ₂ emissions DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05	m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO ₂ en Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot Net Standard case Actual case CO ₂ emissions DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calculation missions om electrical appliances om cooking cal CO ₂ emissions e CO ₂ emissions essions om electrical appliances	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05 36.05	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2 center ENE 7 – Low and Zero Standard case CO2 energy Total floor area DER CO2 emissions fro Standard case tot Net Standard case tot Net Standard case Actual case CO2 emissions DER CO2 emissions fro	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions sions om electrical appliances om cooking	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05 36.05	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effic CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO ₂ en Total floor area DER CO ₂ emissions fro Standard case tot Net Standard case tot Net Standard case Actual case CO ₂ emiss DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot Net Standard case tot Net Standard case tot OER CO ₂ emissions fro CO ₂ emissions fro	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking cal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking cooking cooking cooking cooking cooking cooking	ation		House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05 36.05	m ² kgCO ₂ /yr/m ²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO2 en Total floor area DER CO2 emissions fro Standard case tot Net Standard case tot Net Standard case DER CO2 emissions fro CO2 emissions fro Standard case tot Net Standard case CO2 emissions fro Actual case total CO2 emissions fro	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking cal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking cooking cooking cooking cooking cooking cooking		n	House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05 36.05 16.64 15.32 1.89 33.85	m² kgCO2/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)
Dwelling type Fabric energy effice CfSH ENE2 credits CfSH ENE1 and 2 of ENE 7 – Low and Zero Standard case CO2 en Total floor area DER CO2 emissions fro Standard case tot Net Standard case tot Net Standard case DER CO2 emissions fro CO2 emissions fro Standard case tot Net Standard case CO2 emissions fro Actual case total CO2 emissions fro	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking cal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om electrical appliances om cooking c		n	House, Se 41.82 8.0 4 97.6 18.84 15.32 1.89 36.05 36.05 16.64 15.32 1.89 33.85 0.00	m² kgCO2/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5) (ZC7)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:27:21

Project Information					
Assessed By	Mark Rogers	Building Type	House, Semi-detached		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details			
Assessment Type	As designed	Total Floor Area	98 m ²
Site Reference	sc100235 P8 Bitterne Church	Plot Reference	001
Address	Bitterne Parish Church Plot 8	Whites Lane, Southampton, SO	19 7NP

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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

1a Target emission rate and dwelling emission	rate			
Fuel for main heating system	Electricity			
Target carbon dioxide emission rate	10.66 kgCO ₂ /m ²			
Dwelling carbon dioxide emission rate	3.91 kgCO ₂ /m ²	OK		
1b Target primary energy rate and dwelling pri	mary energy			
Target primary energy	55.61 kWh _{PE} /m ²			
Dwelling primary energy	40.74 kWh _{PE} /m ²	OK		
1c Target fabric energy efficiency and dwelling fabric energy efficiency				
Target fabric energy efficiency	37.4 kWh/m ²			
Dwelling fabric energy efficiency	35.8 kWh/m ²	OK		

2a Fabric U-values					
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value		
External walls	0.26	0.22	Walls (1) (0.22)	OK	
Party walls	0.2	0	Party Wall (1) (0)	N/A	
Curtain walls	1.6	0	N/A	N/A	
Floors	0.18	0.11	Ground Floor (0.11)	OK	
Roofs	0.16	0.09	Roof (1) (0.09)	OK	
Windows, doors,	1.6	1.2	Front East Door (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)	83.28	0.22		
Exposed wall: Walls (2)	6	0.21		
Party wall: Party Wall (1)	47.38	0 (!)		
Ground floor: Ground Floor, Ground Floor	48.8	0.11		
Exposed roof: Roof (1)	48.8	0.09 (!)		

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]
Front East Door, New Dwell Entrance	2.01	West	N/A	1.2
Door				
Front East Windows, New Dwelling DG	2.73	West	0.7	1.2
Window				
Front East Window, New Dwelling DG	1.9	West	0.7	1.2
Window				
Side North Windows, New Dwelling DG	1.8	North	0.7	1.2
Window				
Rear West Windows, New Dwelling DG	3.94	East	0.7	1.2
Window				
Rear West Windows, New Dwell DG	3.92	East	0.7	1.2
French Doors				

Name	Aroa [m²]	Orientation	Eramo factor	U-Value [W/m ² K]
Iname	Area [m²]	Unentation	Frame factor	U-Value IVV/III KI

Main element	Main Dwelling: Thermal bridging ca			
Main element	Junction detail	Source	Psi value	Drawing /
			[W/mK]	reference
External wall	E2: Other lintels (including other	Calculated by person with suitable	0.05	IG or Keystone
	steel lintels)	expertise		Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised
				Construction
				Detail
External wall	E4: Jamb	Calculated by person with suitable	0.014 (!)	Recognised
		expertise	.,	Construction
				Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable	0.068	Recognised
	,	expertise		Construction
				Detail
External wall	E6: Intermediate floor within a	Calculated by person with suitable	0.001 (!)	Recognised
	dwelling	expertise	(1)	Construction
				Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised
				Construction
				Detail
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised
				Construction
	,	'		Detail
External wall	E16: Corner (normal)	Calculated by person with suitable	0.051	Recognised
		expertise		Construction
				Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable	0.044	Recognised
	,	expertise		Construction
				Detail
Party wall	P1: Ground floor	Calculated by person with suitable	0.103	Recognised
		expertise		Construction
		-		Detail
Party wall	P2: Intermediate floor within a	SAP table default	0 (!)	
	dwelling			
Party wall	P4: Roof (insulation at ceiling	Calculated by person with suitable	0.101	Recognised
	level)	expertise		Construction
				Detail

3 Air permeability (better than typically expected values are flagged with a subsequent (!))			
Maximum permitted air permeability at 50Pa	$8 \text{ m}^3/\text{hm}^2$		
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK	
Air permeability test certificate reference		•	

4 Space heating	
Main heating system 1: Hea	at pump with radiators or underfloor heating - Electricity
Efficiency	233.8%
Emitter type	Radiators
Flow temperature	55°C
System type	Heat Pump
Manufacturer	Daikin Europe NV
Model	EDLA04EV3
Commissioning	
Secondary heating system	: N/A
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water					
Cylinder/store - type: Cylinder	400 14				
Capacity	180 litres				
Declared heat loss	1.39 kWh/day				
Primary pipework insulated	Yes				
Manufacturer					
Model					
Commissioning					
Waste water heat recovery system 1 -	type: N/A				
Efficiency					
Manufacturer					
Model					
6 Controls					
Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical s	ervices		
Function		, ,			
Ecodesign class					
Manufacturer					
Model					
Water heating - type: Cylinder thermosta	at and HW separately	timed			
Manufacturer					
Model					
7 Lighting	75 / 44/				
Minimum permitted light source efficacy	75 lm/W		01/		
Lowest light source efficacy	75 lm/W		OK		
External lights control	N/A				
8 Mechanical ventilation					
System type: N/A					
Maximum permitted specific fan power	N/A				
Specific fan power	N/A		N/A		
Minimum permitted heat recovery	N/A				
efficiency					
Heat recovery efficiency	N/A		N/A		
Manufacturer/Model					
Commissioning					
9 Local generation					
N/A					
IN/A					
10 Heat networks					
N/A					
11 Supporting documentary evidence					
N/A					
12 Declarations					
a. Assessor Declaration					
		ontents of this BREL Compliance Report			
		nformation submitted for this dwelling for			
	the purpose of carrying out the "As designed" assessment, and that the supporting documentary				
evidence (SAP Conventions, Appendi					
documentary evidence required) has	been reviewed in the	course of preparing this BREL			
Compliance Report.					
Signed:		Assessor ID:			
Name:		Date:			
1.011.15					
b. Client Declaration					
N/A					

Predicted Energy Assessment



Plot 8, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

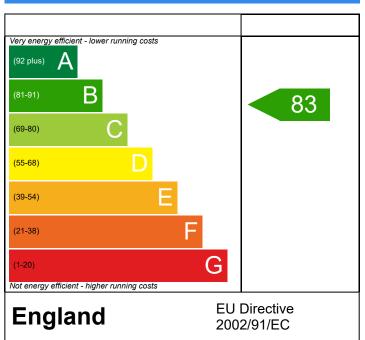
House, Semi-Detached Dwelling type: Date of assessment: 06/12/2023 Produced by: Mark Rogers Total floor area: 97.6 m² DRRN:

6525-6220-0972

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.

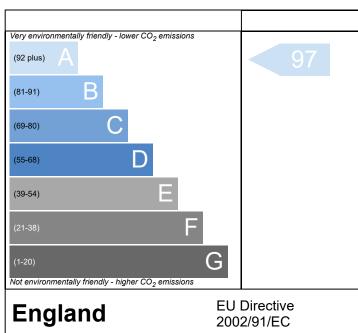
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc1002	235 P8 Bitterne	Church					Issued	on Date	06/	12/2023	
Assessment Reference	001				Prop	Type F	Ref	New Dw	elling			
Property	Plot 8,	Bitterne Parish	Church, Whites Lane, S	outhampto	n, Hamp	shire , S	SO19 7NF)				
SAP Rating			83 B	DER		3.91			TER		10.66	
Environmental			97 A	% DER	< TER	0.0					63.32	
CO ₂ Emissions (t/year)			0.32	DFEE		35.7	7		TFEE		37.43	
Compliance Check			See BREL	% DFE	E < TFEE						4.44	
% DPER < TPER			26.73	DPER		40.7	4		TPER		55.61	
Assessor Details	Mn. Maule De								Assesso	r ID	A320-00	-04
Client	Mr. Mark Ro	n Studio, Philip	Dudlov						ASSESSU	ן טויו	4320-00	01
SUMMARY FOR INPL		•										
	I DAIA FOR	. New Bullu										
Orientation			West									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Semi-Detac	hed								
2.0 Number of Storeys			2									
3.0 Date Built			2023									
4.0 Sheltered Sides			1									
5.0 Sunlight/Shade Average or unknown												
6.0 Thermal Mass Parame	ter		Precise calculation									
7.0 Electricity Tariff			Standard									
Smart electricity meter	fitted		No									
Smart gas meter fitted			No									
7.0 Measurements												
			Ground flo	or:	20.50 n	n	· Int	ernal Flo 48.80	m²	Avera	2.39 r	
			1st Store	ey:	20.50 n	n 		48.80	m²		2.76 r	n
8.0 Living Area									1 ²			
			13.88					"				
9.0 External Walls	Type	Construction	13.88	II-Value	Kanna	Gross	Nott Area		Shaltar	Openie	nge Arga	Calculatio
9.0 External Walls Description	Type Cavity Wall	Construction Cavity wall: plaste		U-Value (W/m²K) 0.22	(kJ/m²K)	Area(m²)	Nett Area : (m²) 83.28	Shelter Res	Shelter	•	-	Type
9.0 External Walls	Type Cavity Wall	Cavity wall; plaste	rboard on dabs or battens, ate block, filled cavity, any					Shelter	Shelter None	r Openii 14.4	-	Type
9.0 External Walls Description		Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste	rboard on dabs or battens,	(W/m ² K)	(kJ/m²K)	Area(m²)	(m²)	Shelter Res		•	0 Calcul	Type late Wall Are
9.0 External Walls Description External Cavity Wall	Cavity Wall	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg	rboard on dabs or battens, ate block, filled cavity, any rboard on dabs or battens,	(W/m²K) 0.22	(kJ/m²K) 110.00	Area(m²) 97.68	(m²) 83.28	Shelter Res 0.00	None	14.4	0 Calcul	Calculation Type ate Wall Are
9.0 External Walls Description External Cavity Wall External Tile Hung Wall	Cavity Wall	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any	(W/m²K) 0.22	(kJ/m²K) 110.00	Area(m²) 97.68 7.90	(m²) 83.28 6.00	Shelter Res 0.00 0.00	None None	14.4 1.90 Shelter	0 Calcul	Type late Wall Are
9.0 External Walls Description External Cavity Wall External Tile Hung Wall 9.1 Party Walls	Cavity Wall Cavity Wall	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg outside structure Constructure ty with Single	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any	(W/m²K) 0.22 0.21	(kJ/m²K) 110.00	Area(m²) 97.68 7.90	(m²) 83.28 6.00	Shelter Res 0.00 0.00	None None	14.4 1.90	0 Calcul	Type late Wall Ar r Gross Are
9.0 External Walls Description External Cavity Wall External Tile Hung Wall 9.1 Party Walls Description	Cavity Wall Cavity Wall Type Filled Cavit	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg outside structure Constructure ty with Single	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any uction	(W/m²K) 0.22 0.21	(kJ/m²K) 110.00	Area(m²) 97.68 7.90	(m²) 83.28 6.00 U-Value (W/m²K)	Shelter Res 0.00 0.00 Kappa (kJ/m²K)	None None Area (m²)	14.4 1.90 Shelter	0 Calcul	Type late Wall Ar r Gross Are
9.0 External Walls Description External Cavity Wall External Tile Hung Wall 9.1 Party Walls Description Party Wall	Cavity Wall Cavity Wall Type Filled Cavit	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg outside structure Constructure ty with Single	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any uction plasterboard on dabs boate blocks, cavity or cav	(W/m²K) 0.22 0.21	(kJ/m²K) 110.00	Area(m²) 97.68 7.90	(m²) 83.28 6.00 U-Value (W/m²K)	Shelter Res 0.00 0.00 Kappa (kJ/m²K)	None None Area (m²)	14.4 1.90 Shelter Res	O Calcul O Ente	Type ate Wall Are r Gross Are neiter
9.0 External Walls Description External Cavity Wall External Tile Hung Wall 9.1 Party Walls Description Party Wall	Cavity Wall Cavity Wall Type Filled Cavit	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg outside structure Constructure Constructure ty with Single aggreg Constructure	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any uction plasterboard on dabs boate blocks, cavity or cav	(W/m²K) 0.22 0.21	(kJ/m²K) 110.00	Area(m²) 97.68 7.90	(m²) 83.28 6.00 U-Value (W/m²K)	Shelter Res 0.00 0.00 Kappa (kJ/m²K)	None None Area (m²)	14.4 1.90 Shelter Res K. (kJ	O Calcul O Ente	Type late Wall Ar r Gross Are nelter lone Area (m
9.0 External Walls Description External Cavity Wall External Tile Hung Wall 9.1 Party Walls Description Party Wall 9.2 Internal Walls Description	Cavity Wall Cavity Wall Type Filled Cavit	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg outside structure Constructure Constructure ty with Single aggreg Constructure	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any uction plasterboard on dabs boate blocks, cavity or caviction	(W/m²K) 0.22 0.21	(kJ/m²K) 110.00	Area(m²) 97.68 7.90	(m²) 83.28 6.00 U-Value (W/m²K)	Shelter Res 0.00 0.00 Kappa (kJ/m²K)	None None Area (m²)	14.4 1.90 Shelter Res K. (kJ	O Calcul O Ente	Type ate Wall Are r Gross Are
9.0 External Walls Description External Cavity Wall External Tile Hung Wall 9.1 Party Walls Description Party Wall 9.2 Internal Walls Description Internal Stud Walls	Cavity Wall Cavity Wall Type Filled Cavit	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg outside structure Constructure Constructure ty with Single aggreg Constructure	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any uction plasterboard on dabs boate blocks, cavity or cavity or cavity or cavity or cavity or cavity on timber frame	(W/m²k) 0.22 0.21 oth sides, li vity fill	ghtweigh	7.90 (appa	(m²) 83.28 6.00 U-Value (W/m²K) 0.00	Shelter Res 0.00 0.00 Kappa (kJ/m²K) 110.00	None Area (m²) 47.38	Shelter Res Ki (kJ	O Calcul O Enter Sh N appa J/m²K) 9.00	Type late Wall Ar r Gross Are nelter lone Area (m 187.53
9.0 External Walls Description External Cavity Wall External Tile Hung Wall 9.1 Party Walls Description Party Wall 9.2 Internal Walls Description Internal Stud Walls 10.0 External Roofs	Cavity Wall Cavity Wall Type Filled Cavit Edge Seali	Cavity wall; plaste lightweight aggreg outside structure Cavity wall; plaste lightweight aggreg outside structure Constructive Constructive Constructive Constructive Constructive Constructive Constructive	rboard on dabs or battens, late block, filled cavity, any rboard on dabs or battens, late block, filled cavity, any uction plasterboard on dabs boate blocks, cavity or cavity or cavity or cavity or cavity or cavity on timber frame	(W/m²k) 0.22 0.21 oth sides, li vity fill	ghtweigh	7.90 (appa	(m²) 83.28 6.00 U-Value (W/m²K) 0.00	Shelter Res 0.00 0.00 Kappa (kJ/m²K) 110.00	None None Area (m²) 47.38	Shelter Res King Shelter Cal Factor 0.00 Ca	O Calcul O Ente	Type late Wall Ar r Gross Are nelter lone Area (m 187.53

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11.0 Heat Loss Floors



Description	Туре	Storey Index	(Construction		U-Val (W/m²		Shelter Code		nelter Kapı actor (kJ/m	
Ground Floor	Ground Floor - Solid	Lowest occup	oied	Suspended concrete floor	r, carpeted	0.11		None		0.00 75.0	
11.2 Internal Floors Description		Storey Index	Cons	struction						Kappa (kJ/m²K)	Area (m²)
Internal Floor		aox	Plast	terboard ceiling, carpe	eted chipboard fl	oor				9.00	48.80
12.0 Opening Types	5.4.0	_				.			_	_	
Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Doo New Dwell DG French Doors	r Manufacturer Manufacturer	Half Glaze Window	ed Doo	Double Low-E				0.36 0.71		0.70 0.70	1.20 1.20
New Dwelling DG Window	w Manufacturer	Window		Double Low-E	Soft 0.05			0.71		0.70	1.20
13.0 Openings Name	Opening Ty	no		Location		Orienta	ntion	Aron	m2\	Di	tch
Front East Door Front East Windows Front East Window Side North Windows Rear West Windows Rear West Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin New Dwellin	ntrance Do g DG Windo g DG Windo g DG Windo g DG Windo g DG Windo	or ow ow ow	External Cavity Wall External Cavity Wall External Tile Hung W External Cavity Wall External Cavity Wall External Cavity Wall External Cavity Wall	'all	We: We: We: Nor Eas	st st st th	Area (2.0 2.7 1.9 1.8 3.9 3.9	1 3 0 0 4	F	icii
14.0 Conservatory				None							
15.0 Draught Proofing			Ī	100				%			
16.0 Draught Lobby			Ī	No							
17.0 Thermal Bridging 17.1 List of Bridges			L	Calculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E18 Party wall between o P1 Party wall - Ground flo P2 Party wall - Intermedia P4 Party wall - Roof (insu	nin a dwelling ceiling level) ceiling level) dwellings oor ate floor within a	dwelling	Inder Inder Inder Inder Inder Inder Inder Inder Inder Table	cee Type Dendently assessed	Length 11.46 10.50 28.80 20.50 20.50 18.52 1.98 10.30 10.30 9.20 9.20	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 0.04 0.10 0.00 0.10	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 0.04 0.10 0.00 0.10	d Reference: IG or Keyst Recognisec	one Hi Th I Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	No No No No No No No No
Y-value				0.00				W/m²K			
18.0 Pressure Testing				Yes							
Designed AP ₅₀			Ī	5.05				m³/(h.m	²) @ 50 P	'a	
Test Method			Ī	Blower Door							
19.0 Mechanical Ventilation	<u> </u>										
Mechanical Ventilation											
Mechanical Ventilat	tion System Pres	ent		No							
20.0 Fans, Open Fireplaces	, Flues										
21.0 Fixed Cooling System				No							
22.0 Lighting											
No Fixed Lighting				No							
			Low	Name energy Lighting	Efficacy 75.00		wer 5	Capa 112			ount 36
24.0 Main Heating 1			Г	Database							
Description				Electric Air Source He	eat Pump						
Percentage of Heat				100.00	•			%			
Database Ref. No.			Ī	106465							
Fuel Type			Ī	Electricity							
In Winter				0.00							
In Summer			Ī	0.00							
Model Name			Ī	EDLA04EV3							
			L								

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Recommendations Lower cost measures		
31.0 Thermal Store	None	
In Airing Cupboard	No	
Pipes insulation	Fully insulated primary pipework	
Loss	1.39	kWh/day
Cylinder Volume	180.00	L
Insulation Type	Measured Loss	 -
Independent Time Control	Yes	
Cylinder In Heated Space	Yes	
Cylinder Stat	Yes	
29.0 Hot Water Cylinder	Hot Water Cylinder	
28.3 Waste Water Heat Recovery System		
28.1 Showers Description Shower Type	Flow Rate Rated Power C [l/min] [kW]	Connected Connected To
Immersion Only Heating Hot Water	No	
Bath Count	1	
Cold Water Source	From mains	
Water use <= 125 litres/person/day	Yes	
Solar Panel	No	
Waste Water Heat Recovery Storage System	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Flue Gas Heat Recovery System	No	
SAP Code	901	
28.0 Water Heating Water Heating	Main Heating 1	
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5		
Heat Source Fuel Type Heating Us	se Efficiency Percentage Of Heat Heat Elec Heat Power Ratio	ctrical Fuel Factor Efficiency type
26.0 Heat Networks	None	
25.0 Main Heating 2	None	
Flow Temperature Value	55.00	
Flow Temperature	Enter value	
Heat Emitter	Radiators	
Heating Pump Age	2013 or later	
Is MHS Pumped	Pump in heated space	
PCDF Controls	0	
Controls SAP Code	2207	
System Type	Heat Pump	

Further measures to achieve even higher standards

Ratings after improvement rating Environmental Impact **Typical Cost** Typical savings per year SAP rating B 84 B 90 £4,000 - £6,000 £3,500 - £5,500 £47 £196 A 97 A 98 0

SAP 10 Online 2.12.2 Page 3 of 3

Thermal Bridging



Property Reference	sc100235 P8 Bitterne C	sc100235 P8 Bitterne Church				06/12/2023			
Assessment Reference	001	001 Prop Type Ref				e			
Property	Plot 8, Bitterne Parish C	Plot 8, Bitterne Parish Church, Whites Lane, Southampton, Hampshire , SO19 7NP							
SAP Rating		83 B	DER	3.91	TER	10.66			
Environmental	97 A % DER < TER				63.32				
CO ₂ Emissions (t/year)		0.32	DFEE	35.77	TFEE	37.43			
Compliance Check		See BREL	% DFEE < TFEE	4.44					
% DPER < TPER		26.73	DPER	40.74	TPER	55.61			
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001			
Client	Vivid Design Studio, Philip D	oudley							

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	11.46	0.57	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	10.50	0.19	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.80	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	20.50	1.39	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	20.50	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.52	1.02	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	1.98	0.11	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.20	0.95	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.20	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.20	0.93	Recognised Construction Detail

Total: 160.46 W/mK: Y-Value: 0.00 W/m²K:

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc121839				Issued on Date	06/12/2023		
Assessment Reference	001		Pro	p Type Ref	f New Dwelling Part L 2021			
Project	Plot 8, Bitterne Parish Ch	Plot 8, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP						
Calculation Type	New Build (As Designed)							
SAP Rating		88 B	DER	13.52	TER	25.39		
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75			
CO₂ Emissions (t/year		1.02	DFEE	41.82	TFEE	53.06		
General Requirement	s Compliance	Pass	% DFEE <tfee< th=""><th></th><th>21.19</th><th></th></tfee<>		21.19			
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001								
Client	rid Design Studio, Vivid Desi	d Design Studio, Vivid Design Studio						

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Total correction = 0.0030 m² K/W

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m ² K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

U-value (unrounded) = 0.09 W/m² K

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121839				Issued on Date	06/12/2023			
Assessment Reference	001			Prop Type Ref	op Type Ref New Dwelling Part L 2021				
Project	Plot 8, Bitterne Parish Chu	Plot 8, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP							
Calculation Type	New Build (As Designed)	New Build (As Designed)							
SAP Rating		88 B	DER	13.52	TER	25.39			
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75				
CO ₂ Emissions (t/year)		1.02	DFEE	41.82	TFEE	53.06			
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>21.19</th><th></th></tfe<>	E	21.19				
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001									
Client	id Design Studio, Vivid Desi	gn Studio							

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
ayer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500	125	0.0340	3.6765	100.00
ayer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121839			I	ssued on Date	06/12/2023		
Assessment Reference	001		Pro	p Type Ref N	Ref New Dwelling Part L 2021			
Project	Plot 8, Bitterne Parish Ch	Plot 8, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP						
Calculation Type	New Build (As Designed)							
SAP Rating		88 B	DER	13.52	TER	25.39		
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75			
CO ₂ Emissions (t/year)		1.02	DFEE	41.82	TFEE	53.06		
General Requirements	Compliance	Pass	% DFEE <tfee< th=""><th></th><th>21.19</th><th></th></tfee<>		21.19			
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001								
Client	id Design Studio, Vivid Desi	d Design Studio, Vivid Design Studio						

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

ayer_	Description	Thickness (mm)	Conductivity (W/m ² K)	(m ² K/W)	Fraction (%)
Ext surface				0.0400	
ayer 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
ayer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
ıyer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m²: 2.500				
yer 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
yer 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
surface				0.1300	

Total correction = $0.0016 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.21 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a





Property Reference	sc121839				Issued on Date	06/12/2023			
Assessment Reference	001			Prop Type Ref	op Type Ref New Dwelling Part L 2021				
Project	Plot 8, Bitterne Parish Chu	Plot 8, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP							
Calculation Type	New Build (As Designed)	New Build (As Designed)							
SAP Rating		88 B	DER	13.52	TER	25.39			
Environmental		89 B	% DER <ter< th=""><th></th><th>46.75</th><th></th></ter<>		46.75				
CO ₂ Emissions (t/year)		1.02	DFEE	41.82	TFEE	53.06			
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>21.19</th><th></th></tfe<>	E	21.19				
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001									
Client	id Design Studio, Vivid Desi	gn Studio							

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 48.80 m², Perimeter = 20.50 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None	e or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W Lower	limit = 7.603 m ²	K/W	Average =	7.656 m ²
	Total correction = 0.0079 m ² K/W	U-value (เ	unrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 9, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



	1015:5					. /
Property Reference						5/12/2023
Assessment Reference	001		Pi	rop Type Ref	New Dwelling Part L 2022	L
Property	Plot 9, Bitterne Parish Ch	nurch, Whites L	ane, Bitterne, Sou	uthampton, H	ampshire , SO19 7NP	
SAP Rating		88 B	DER	13.19	TER	24.78
Environmental		89 B	% DER <ter< td=""><td></td><td>46.78</td><td></td></ter<>		46.78	
CO ₂ Emissions (t/ye	ear)	1.00	DFEE	39.99	TFEE	51.03
General Requireme	•	Pass	% DFEE <tfee< td=""><td></td><td>21.63</td><td></td></tfee<>		21.63	
Assessor Details	Mr. Mark Rogers, Surecalc L mark@surecalc.co.uk	imited, Tel: 012	43572695,		Assessor ID A	320-0001
Client	Vivid Design Studio, Vivid De	esign Studio				
	ission Rate calculation	50.6.1.000.010				
Total floor area				97.6	m²	
DER				13.19	kgCO ₂ /yr/m ²	
TER				24.78	kgCO ₂ /yr/m ²	
	ffset from additional allowab	le electricity gei	neration	0.00	kgCO ₂ /yr/m ²	(ZC7)
	issions offset from biofuel CH			0.00	kgCO ₂ /yr/m ²	(ZC5)
	ons offset from SAP Section 1			0.00	kgCO ₂ /yr/m ²	(/
	for SAP Section 16 allowance			13.19	kgCO ₂ /yr/m ²	
Reduction DER/1				46.78	%	
CfSH ENE1 credit	ts achieved			5.2		
CfSH ENE1 level	achieved			4		
ENE 2 – Fabric Energ	y Efficiency calculation					
ENE 2 – Fabric Energ Dwelling type	y Efficiency calculation			House, S	emi-Detached	
_				House, So 39.99	emi-Detached kWh/m²/yr	
Dwelling type	iciency (F.E.E.)					
Dwelling type Fabric energy effi CfSH ENE2 credits	iciency (F.E.E.)			39.99		
Dwelling type Fabric energy effi CfSH ENE2 credit: CfSH ENE1 and 2	iciency (F.E.E.) s achieved	ılation		39.99 8.5		
Dwelling type Fabric energy effi CfSH ENE2 credit: CfSH ENE1 and 2	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcu	llation		39.99 8.5 4	kWh/m²/yr	
Dwelling type Fabric energy effi CfSH ENE2 credit: CfSH ENE1 and 2 ENE 7 – Low and Zer	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcu	llation		39.99 8.5 4	kWh/m²/yr	
Dwelling type Fabric energy effi CfSH ENE2 credit: CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcu missions	lation		39.99 8.5 4 97.6 18.30	kWh/m²/yr m² kgCO₂/yr/m²	
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances	lation		39.99 8.5 4 97.6 18.30 15.32	m ² kgCO ₂ /yr/m ²	(ZC2)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking	llation		39.99 8.5 4 97.6 18.30 15.32 1.89	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions	lation		39.99 8.5 4 97.6 18.30 15.32 1.89 35.51	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot Net Standard case	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	llation		39.99 8.5 4 97.6 18.30 15.32 1.89	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case tot Net Standard case Actual case CO ₂ emissions	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	lation		39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51	m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions essions	llation		39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from Standard case total Net Standard case CO ₂ emissions from Standard case CO ₃ emissions DER CO ₂ emissions from	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions essions om electrical appliances	lation		39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51 16.31 15.32	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case DER CO ₂ emissions from Standard case total Net Standard case CO ₂ emissions from DER CO ₂ emissions from CO ₂ emissions from CO ₂ emissions from CO ₂ emissions from	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking	lation		39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51 16.31 15.32 1.89	m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC2)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case DER CO ₂ emissions from Standard case total CO ₂ emissions from Actual case total	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking cooking	lation		39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51 16.31 15.32 1.89 33.52	m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case DER CO ₂ emissions from Standard case total CO ₂ emissions from	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking com cooking om electrical appliances om sions om electrical appliances om cooking om Biomass			39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51 16.31 15.32 1.89 33.52 0.00	m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case total CO ₂ emissions from Actual case total CO ₂ reduction from	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om electrical appliances om additional allowable elect		n	39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51 16.31 15.32 1.89 33.52 0.00 0.00	kWh/m²/yr m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5) (ZC7)
Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case DER CO ₂ emissions from Standard case total CO ₂ emissions from CO ₂ reduction from CO ₃ reduction from CO ₄ reduction fro	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om electrical appliances om additional allowable elect	ricity generatio	n	39.99 8.5 4 97.6 18.30 15.32 1.89 35.51 35.51 16.31 15.32 1.89 33.52 0.00	m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

\sim			



Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:28:04

Project Information			
Assessed By	Mark Rogers	Building Type	House, Semi-detached
OCDEA Registration	EES/004179	Assessment Date	2023-12-06

Dwelling Details			
Assessment Type	As designed	Total Floor Area	98 m ²
Site Reference	sc100236 P9 Bitterne Church	Plot Reference	001
Address	Bitterne Parish Church Plot 9	Whites Lane, Southampton, SO	19 7NP

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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

1a Target emission rate and dwelling emission	rate				
Fuel for main heating system	Electricity				
Target carbon dioxide emission rate	10.31 kgCO ₂ /m ²				
Dwelling carbon dioxide emission rate	3.8 kgCO ₂ /m ²	OK			
1b Target primary energy rate and dwelling primary energy					
Target primary energy	53.76 kWh _{PE} /m ²				
Dwelling primary energy	39.53 kWh _{PE} /m ²	OK			
1c Target fabric energy efficiency and dwelling fabric energy efficiency					
Target fabric energy efficiency	35.8 kWh/m²				
Dwelling fabric energy efficiency	34.1 kWh/m ²	OK			

2a Fabric U-values						
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value			
External walls	0.26	0.22	Walls (1) (0.22)	OK		
Party walls	0.2	0	Party Wall (1) (0)	N/A		
Curtain walls	1.6	0	N/A	N/A		
Floors	0.18	0.11	Ground Floor (0.11)	OK		
Roofs	0.16	0.09	Roof (1) (0.09)	OK		
Windows, doors,	1.6	1.2	Front East Door (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)	83.28	0.22		
Exposed wall: Walls (2)	6	0.21		
Party wall: Party Wall (1)	47.38	0 (!)		
Ground floor: Ground Floor, Ground Floor	48.8	0.11		
Exposed roof: Roof (1)	48.8	0.09 (!)		

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]		
Front East Door, New Dwell Entrance	2.01	West	N/A	1.2		
Door						
Front East Windows, New Dwelling DG	2.73	West	0.7	1.2		
Window						
Front East Window, New Dwelling DG	1.9	West	0.7	1.2		
Window						
Side South Windows, New Dwelling DG	1.8	South	0.7	1.2		
Window						
Rear West Windows, New Dwelling DG	3.94	East	0.7	1.2		
Window						
Rear West Windows, New Dwell DG	3.92	East	0.7	1.2		
French Doors						

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]

Main element	Junction detail	Source	Psi value	Drawing /
			[W/mK]	reference
External wall	E2: Other lintels (including other	Calculated by person with suitable	0.05	IG or Keystone
	steel lintels)	expertise		Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected	ed values are flagged with a subsequent (!))
Maximum permitted air permeability at 50Pa	$8 \text{ m}^3/\text{hm}^2$	
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK
Air permeability test certificate reference		•

4 Space heating	
Main heating system 1: Hea	at pump with radiators or underfloor heating - Electricity
Efficiency	233.7%
Emitter type	Radiators
Flow temperature	55°C
System type	Heat Pump
Manufacturer	Daikin Europe NV
Model	EDLA04EV3
Commissioning	
Secondary heating system	: N/A
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water			
Cylinder/store - type: Cylinder	400 13		
Capacity	180 litres		
Declared heat loss	1.39 kWh/day Yes		
Primary pipework insulated Manufacturer	162		
Model			
Commissioning			
Waste water heat recovery system 1 -	type: N/A		
Efficiency	type. N/A		
Manufacturer			
Model			
6 Controls			
	ature zone control by	arrangement of plumbing and electrical s	ervices
Function			
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosta	at and HW separately	timed	
Manufacturer			
Model			
7 Lighting			
Minimum permitted light source efficacy	75 lm/W		
Lowest light source efficacy	75 lm/W		ОК
External lights control	N/A		
9 Machanical vantilation			
8 Mechanical ventilation System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		IN/A
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model	14/71		14/7
Commissioning			
9 Local generation			
N/A			
10 Heat networks			
N/A			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration			
	nfirmation that the co	ontents of this BREL Compliance Report	
are a true and accurate reflection bas	ed upon the design ir	nformation submitted for this dwelling for	
		and that the supporting documentary	
evidence (SAP Conventions, Appendi	x 1 (documentary evi	dence) schedules the minimum	
documentary evidence required) has			
Compliance Report.			
Signed:		Assessor ID:	
Name:		Date:	
b. Client Declaration			
N/A			

Predicted Energy Assessment



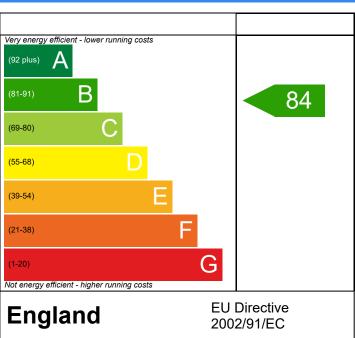
Plot 9, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Semi-Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 97.6 m²
7207-5522-6951

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.

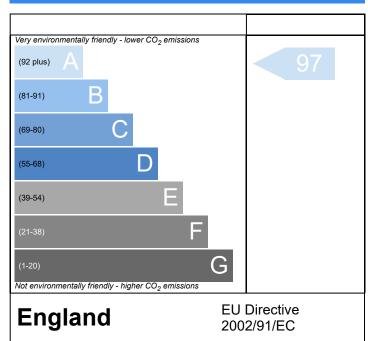
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc1002	236 P9 Bitterne	Church					Issued	d on Date	06/1	2/2023
Assessment Reference	001				Proj	p Type I	Ref	New Dw	/elling		
Property	Plot 9,	Bitterne Parish	Church, Whites Lane, S	Southamp	ton, Hamp	shire , S	SO19 7NF)			
SAP Rating			84 B	DER		3.80			TER	1	0.31
Environmental			97 A	% DEI	R < TER						3.14
CO ₂ Emissions (t/year)			0.31	DFEE		34.1	0		TFEE		5.85
Compliance Check			See BREL	% DFI	E < TFE					4	.86
% DPER < TPER			26.46	DPER		39.5	3		TPER	5	3.76
Assessor Details	Mr. Mark Ro	odere							Assesso	r ID	320-0001
Client		n Studio, Philip	Dudley								320-0001
SUMMARY FOR INPL			•								
	JI BAIATON	t. New Built	`								
Orientation			West								
Property Tenture			ND								
Transaction Type			6								
Terrain Type			Suburban								
1.0 Property Type			House, Semi-Detac	ched							
2.0 Number of Storeys			2								
3.0 Date Built			2023								
4.0 Sheltered Sides			2								
5.0 Sunlight/Shade			Average or unknow	/n							
6.0 Thermal Mass Parame	eter		Precise calculation								
7.0 Electricity Tariff			Standard								
Smart electricity meter	fitted		No								
Smart gas meter fitted			No								
7.0 Measurements											
			Ground flo	or:	t Loss Pe 20.50	m	r Int	ernal Flo 48.80	m²	Averag	e Storey Heig 2.39 m
			1st Stor	ey:	20.50	m		48.80	m²		2.76 m
8.0 Living Area			13.88					n	n²		
9.0 External Walls Description	Type	Construction		II-Valu	Kanna	Gross	Nott Area	Shelter	Shelter	Opening	gs Area Calculat
External Cavity Wall	Type Cavity Wall		erboard on dabs or battens,		• Kappa) (kJ/m²K) 110.00		Nett Area (m²) 83.28	Res 0.00	None	14.40	Type
External Cavity Wall	Ouvity Wall		gate block, filled cavity, any	0.22	110.00	07.00	00.20	0.00	None	14.40	Calculate Wall
					440.00	7.90	6.00	0.00	None	1.90	Enter Gross A
External Tile Hung Wall	Cavity Wall	Cavity wall; plast	erboard on dabs or battens, gate block, filled cavity, any	0.21	110.00						
External Tile Hung Wall 9.1 Party Walls	Cavity Wall	Cavity wall; plast lightweight aggre	erboard on dabs or battens, gate block, filled cavity, any	0.21	110.00						
	Cavity Wall Type	Cavity wall; plast lightweight aggre outside structure	erboard on dabs or battens, gate block, filled cavity, any	0.21	110.00		U-Value (W/m²K)	Kappa (kJ/m²K)	Area	Shelter Res	Shelter
9.1 Party Walls		Cavity wall; plast lightweight aggre outside structure Const	erboard on dabs or battens, gate block, filled cavity, any	oth sides,			U-Value (W/m²K) 0.00	Kappa (kJ/m²K) 110.00		Shelter Res	Shelter None
9.1 Party Walls Description	Type Filled Cavit	Cavity wall; plast lightweight aggre outside structure Const	erboard on dabs or battens, egate block, filled cavity, any cruction plasterboard on dabs b	oth sides,			(W/m^2K)	(kJ/m²K)	(m²)		
9.1 Party Walls Description Party Wall	Type Filled Cavit	Cavity wall; plast lightweight aggre outside structure Const	erboard on dabs or battens, gate block, filled cavity, any cruction plasterboard on dabs begate blocks, cavity or cavity.	oth sides,			(W/m^2K)	(kJ/m²K)	(m²)	Res	None
9.1 Party Walls Description Party Wall 9.2 Internal Walls	Type Filled Cavit	Cavity wall; plast lightweight aggre- outside structure Constity with Single aggre- aggre- Constructure	erboard on dabs or battens, gate block, filled cavity, any cruction plasterboard on dabs begate blocks, cavity or cavity.	oth sides,			(W/m^2K)	(kJ/m²K)	(m²)	Res Ka (kJ/	None
9.1 Party Walls Description Party Wall 9.2 Internal Walls Description	Type Filled Cavit	Cavity wall; plast lightweight aggre- outside structure Constity with Single aggre- aggre- Constr	erboard on dabs or battens, egate block, filled cavity, any cruction plasterboard on dabs bogate blocks, cavity or cavuction	oth sides,			(W/m^2K)	(kJ/m²K)	(m²)	Res Ka (kJ/	None ppa Area (r
9.1 Party Walls Description Party Wall 9.2 Internal Walls Description Internal Stud Walls	Type Filled Cavit	Cavity wall; plast lightweight aggre- outside structure Constity with Single aggre- aggre- Constr	erboard on dabs or battens, egate block, filled cavity, any cruction plasterboard on dabs begate blocks, cavity or cavuction poard on timber frame	oth sides, vity fill	lightweigh	nt (appa	(W/m²K) 0.00	(kJ/m²K) 110.00	(m²) 47.38	Res Ka (kJ/ 9	None ppa Area (r m²K) .00 187.5
9.1 Party Walls Description Party Wall 9.2 Internal Walls Description Internal Stud Walls 10.0 External Roofs	Type Filled Cavit Edge Seali	Cavity wall; plast lightweight aggre outside structure Const with Single aggre. Construction Construction Construction Construction Construction Construction Construction Construction	erboard on dabs or battens, egate block, filled cavity, any cruction plasterboard on dabs begate blocks, cavity or cavuction poard on timber frame	oth sides, vity fill (lightweigh	nt (appa	(W/m²K) 0.00	(kJ/m²K) 110.00	(m²) 47.38	Ka (kJ/9.	None ppa Area (r m²K) .00 187.5

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11.0 Heat Loss Floors



Description	Туре	Storey Index		Construction		U-Valı (W/m²		Shelter Code		elter Kapp ctor (kJ/m	
Ground Floor	Ground Floor - Solid	Lowest occup	oied S	Suspended concrete floor	, carpeted	0.11		None	0	.00 75.0	0 48.80
11.2 Internal Floors Description		Storey Index	Const	ruction						Kappa (kJ/m²K)	
Internal Floor			Plaste	rboard ceiling, carpe	eted chipboard fl	oor				9.00	48.80
12.0 Opening Types	Data Source	Type		Glazina		Glazina	Filling	G value	Eromo	Eromo	II Value
Description New Dwell Entrance Doc	Data Source or Manufacturer	Type Half Glaze	ed Door			Glazing Gap	Filling Type	G-value 0.36	Frame Type	Frame Factor 0.70	U Value (W/m ² K) 1.20
New Dwell DG French Doors New Dwelling DG Windo	Manufacturer	Window Window		Double Low-E S				0.71 0.71		0.70 0.70	1.20 1.20
	w Manufacturer	Williaow		Double Low-E	5011 0.05			0.71		0.70	1.20
Name Front East Door Front East Windows Front East Window Side South Windows Rear West Windows Rear West Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin New Dwell D	entrance Do g DG Windo g DG Windo g DG Windo g DG Windo g DG Windo	or E ow E ow E ow E ow E	ocation xternal Cavity Wall xternal Cavity Wall xternal Tile Hung W xternal Cavity Wall xternal Cavity Wall xternal Cavity Wall	all	Orienta Wes Wes Sout Eas Eas	st st st th tt	Area (2.01 2.73 1.90 1.80 3.94 3.92)))	Pi	tch
14.0 Conservatory			N	one							
15.0 Draught Proofing				00				%			
16.0 Draught Lobby			N					= "			
				-							
17.0 Thermal Bridging 17.1 List of Bridges			С	alculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E18 Party wall between of P1 Party wall - Ground floor P2 Party wall - Intermedi P4 Party wall - Roof (insu	nin a dwelling ceiling level) ceiling level) dwellings oor ate floor within a	, dwelling	Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper	e Type endently assessed	Length 11.46 10.50 28.80 20.50 20.50 18.52 1.98 10.30 10.30 9.20 9.20	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	d Reference: IG or Keystr Recognised	Construct Construct Construct Construct Construct Construct Construct Construct Construct Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	No No No No No No No
Y-value			0.	.00				W/m²K			
18.0 Pressure Testing			Ye	es							
Designed AP50			5.	.05				m³/(h.m²	²) @ 50 P	а	
Test Method			В	lower Door							
19.0 Mechanical Ventilation	1										
Mechanical Ventilation			_					_			
Mechanical Ventila	tion System Pres	ent	N	0							
20.0 Fans, Open Fireplaces	s, Flues										
21.0 Fixed Cooling System			N	0							
22.0 Lighting											
No Fixed Lighting			N								
			Low e	Name energy Lighting	Efficacy 75.00	Po \ 1		Capa 112			ount 36
24.0 Main Heating 1			D	atabase							
Description			E	lectric Air Source He	eat Pump			_			
Percentage of Heat			10	00.00				%			
Database Ref. No.			10	06465							
Fuel Type			E	lectricity				$\overline{}$			
In Winter				.00				Ħ			
In Summer				.00				Ħ			
Model Name			E	DLA04EV3				Ħ			
				-							

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Manufacture	Delikin France ANV	
Manufacturer	Daikin Europe NV	
System Type	Heat Pump	
Controls SAP Code	2207	
PCDF Controls	O Down in host of course	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None	
Heat Source Fuel Type Heating Use Heat source 1 Heat source 2 Heat source 3	se Efficiency Percentage Of Heat Heat Elec Heat Power Ratio	ctrical Fuel Factor Efficiency type
Heat source 4 Heat source 5		
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	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.1 Showers Description Shower Type	e Flow Rate Rated Power C [l/min] [kW]	connected Connected To
28.3 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 Type	Measured Loss	
Cylinder Volume	180.00	L
Loss	1.39	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	
31.0 Thermal Store	None	
Recommendations Lower cost measures		

Further measures to achieve even higher standards

Ratings after improvement rating Environmental Impact **Typical Cost** Typical savings per year SAP rating B 85 B 91 £4,000 - £6,000 £3,500 - £5,500 £47 £196 A 97 A 98 0

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Thermal Bridging



Property Reference	sc100236 P9 Bitterne C	hurch			ssued on Date	06/12/2023
Assessment Reference	001		Prop	Type Ref Se	emi-Detached House	;
Property	Plot 9, Bitterne Parish C	Church, Whites Lane,	Southampton, Hamp	oshire , SO19 7NP		
SAP Rating		84 B	DER	3.80	TER	10.31
Environmental		97 A	% DER < TER			63.14
CO ₂ Emissions (t/year)		0.31	DFEE	34.10	TFEE	35.85
Compliance Check		See BREL	% DFEE < TFEE			4.86
% DPER < TPER		26.46	DPER	39.53	TPER	53.76
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001
Client	Vivid Design Studio, Philip D	udley				

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	11.46	0.57	IG or Keystone Hi Therm
External wall	E3 Sill	Independently assessed	0.018	10.50	0.19	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.80	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	20.50	1.39	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	20.50	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.52	1.02	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	1.98	0.11	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.20	0.95	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.20	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.20	0.93	Recognised Construction Detail

Total: 160.46 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121840				Issued on Date	06/12/2023
Assessment Reference	ce 001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 9, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, S	outhampton, H	ampshire , SO19 7N	NP
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	13.19	TER	24.78
Environmental		89 B	% DER <ter< th=""><th></th><th>46.78</th><th></th></ter<>		46.78	
CO ₂ Emissions (t/y	ear)	1.00	DFEE	39.99	TFEE	51.03
General Requirem	ents Compliance	Pass	% DFEE <tfee< th=""><th></th><th>21.63</th><th></th></tfee<>		21.63	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, mark	@surecalc.co.u	k Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	ign Studio				

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.0400	
ayer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
ayer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
ayer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
ayer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1000	

Startesistance. Opper mine = 11.445 iii ky w

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference	sc121840				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 9, Bitterne Parish Ch	urch, Whites L	ane, Bitterne, So	outhampton, H	ampshire , SO19 7N	IP .
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	13.19	TER	24.78
Environmental		89 B	% DER <ter< th=""><th></th><th>46.78</th><th></th></ter<>		46.78	
CO ₂ Emissions (t/ye	ar)	1.00	DFEE	39.99	TFEE	51.03
General Requireme	nts Compliance	Pass	% DFEE <tfee< th=""><th></th><th>21.63</th><th></th></tfee<>		21.63	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, mark	@surecalc.co.u	ık Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Des	gn Studio				

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	. ,
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
ayer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500	125	0.0340	3.6765	100.00
ayer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121840	sc121840			Issued on Date	06/12/2023
Assessment Reference	e 001	001 Prop Type F				2021
Project	Plot 9, Bitterne Parish Ch	Plot 9, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP				NP
Calculation Type	New Build (As Designed)	New Build (As Designed)				
SAP Rating		88 B	DER	13.19 TER 24.78		
Environmental		89 B	% DER <ter< th=""><th colspan="3">46.78</th></ter<>	46.78		
CO ₂ Emissions (t/ye	ear)	1.00	DFEE	39.99 TFEE 51.03		
General Requireme	ents Compliance	Pass	% DFEE <tfee< th=""><th colspan="3">21.63</th></tfee<>	21.63		
Assessor Details	Mr. Mark Rogers, Surecalc Lim	Ir. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001				
Client	Vivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
ayer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity: Normal				
ayer 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500	125	0.0340	3.6765	100.00
ayer 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
ayer 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1300	

Total correction = 0.0016 m² K/W U-value (unrounded) = 0.21 W/m² K

Unheated space: None

> Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference	sc121840	sc121840			Issued on Date	06/12/2023	
Assessment Reference	001	001 Prop Type R			New Dwelling Part L	2021	
Project	Plot 9, Bitterne Parish Chu	Plot 9, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP				NP.	
Calculation Type	New Build (As Designed)	New Build (As Designed)					
SAP Rating	88 B	DER	13.19	TER	24.78		
Environmental		89 B	% DER <ter< th=""><th></th><th colspan="3">46.78</th></ter<>		46.78		
CO ₂ Emissions (t/year)		1.00	DFEE	39.99	39.99 TFEE 51.03		
General Requirements	Compliance	Pass	% DFEE <tfee 21.63<="" th=""></tfee>				
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001							
Client	id Design Studio, Vivid Desi	gn Studio					

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 48.80 m², Perimeter = 20.50 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Lavor	Description		Thickness	Conductivity	Resistance	Fraction
Layer	Description		(mm)	(W/m ² K)	(m^2K/W)	(%)
Ext surface					0.1700	
Layer 1	Blockwork					
	Main construction		100	0.1900	0.5263	90.91
	Main construction		100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor					
	Main construction		150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fastener	s: None or				
	plastic					
Layer 3	Screed					
	Main construction		75	1.1500	0.0652	100.00
Int surface					0.1700	
Total resistan	ce: Upper limit = 7.709 m ² K/W	Lower limit =	7.603 m²	K/W	Average =	7.656 m² K
	Total correction = 0.0079 m ² K/W		U-value (ւ	unrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 10, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121841				Issued on Date	06/12/2023
Assessment	001		Pr	op Type Ref	New Dwelling Part L 20	21
Reference	Dist 40 Ditts as a Devision C	Na a la . NA / la lita a .	- I D:H C-			`
Property	Plot 10, Bitterne Parish C	nurch, whites	s Lane, Βitterne, So	utnampton, F	iampsnire , SO19 /NF	,
SAP Rating		88 B	DER	13.43	TER	25.18
Environmental		89 B	% DER <ter< td=""><td></td><td>46.67</td><td></td></ter<>		46.67	
CO ₂ Emissions (t/ye		1.02	DFEE	41.21	TFEE	52.36
General Requireme	ents Compliance	Pass	% DFEE <tfee< td=""><td></td><td>21.30</td><td></td></tfee<>		21.30	
Assessor Details	Mr. Mark Rogers, Surecalc Li mark@surecalc.co.uk	mited, Tel: 01	243572695,		Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid De	sign Studio				
	nission Rate calculation	SIBIT Stadio				
Total floor area	iission nate calculation			97.6	m²	
DER				13.43	kgCO₂/yr/m	n ²
TER				25.18	kgCO ₂ /yr/m	
	offset from additional allowable	e electricity ga	eneration	0.00	kgCO ₂ /yr/m	
	nissions offset from biofuel CH			0.00	kgCO ₂ /yr/m	
	ions offset from SAP Section 1			0.00	kgCO ₂ /yr/m	
	for SAP Section 16 allowances			13.43	kgCO ₂ /yr/m	
Reduction DER/				46.67	%	
CfSH ENE1 credi				5.2		
CfSH ENE1 level	achieved			4		
ENE 2 – Fabric Energ	gy Efficiency calculation					
Dwelling type				House, Se	mi-Detached	
Fabric energy eff	ficiency (F.E.E.)			41.21	kWh/m²/yr	<u>-</u>
CfSH ENE2 credit	ts achieved			8.2		
CfSH ENE1 and 2	overall level achieved			4		
ENE 7 – Low and Ze	ro Carbon Technologies calcul	lation				
Standard case CO ₂ e	emissions					
Total floor area				97.6	m²	
DER				18.64	kgCO₂/yr/m	2
CO ₂ emissions fr	om electrical appliances			15.32	kgCO₂/yr/m	² (ZC2)
CO ₂ emissions fr	om cooking			1.89	kgCO₂/yr/m	² (ZC3)
Standard case to	tal CO₂ emissions			35.85	kgCO₂/yr/m	² (ZC4)
Net Standard cas	se CO ₂ emissions			35.85	kgCO₂/yr/m	² (ZC8)
Actual case CO₂ emi	<u>issions</u>					
DER				16.54	kgCO₂/yr/m	2
	om electrical appliances			15.32	kgCO₂/yr/m	
CO ₂ emissions fr	_			1.89	kgCO₂/yr/m	
Actual case total				33.75	kgCO₂/yr/m	
CO ₂ emissions fr				0.00	kgCO₂/yr/m	
	om additional allowable electr	icity generation	on	0.00	kgCO₂/yr/m	
Net Actual case (33.75	kgCO₂/yr/m	² (ZC8)
Improvement in	6	%				



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

\sim			



Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:28:45

Project Information					
Assessed By	Mark Rogers	Building Type	House, Semi-detached		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details				
Assessment Type	As designed	Total Floor Area	98 m ²	
Site Reference	sc100237 P10 Bitterne	Plot Reference	001	
	Church			
Address	Bitterne Parish Church Plot 10	Bitterne Parish Church Plot 10 Whites Lane, Southampton, SO19 7NP		

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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

1a Target emission rate and dwelling emission	rate				
Fuel for main heating system	Electricity				
Target carbon dioxide emission rate	10.53 kgCO ₂ /m ²				
Dwelling carbon dioxide emission rate	3.87 kgCO ₂ /m ²	OK			
1b Target primary energy rate and dwelling primary energy					
Target primary energy	54.94 kWh _{PE} /m ²				
Dwelling primary energy	40.26 kWh _{PE} /m ²	OK			
1c Target fabric energy efficiency and dwelling fabric energy efficiency					
Target fabric energy efficiency	36.8 kWh/m ²				
Dwelling fabric energy efficiency	35.2 kWh/m ²	ОК			

2a Fabric U-values						
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m²K]	Element with highest individual U-Value			
External walls	0.26	0.22	Walls (1) (0.22)	OK		
Party walls	0.2	0	Party Wall (1) (0)	N/A		
Curtain walls	1.6	0	N/A	N/A		
Floors	0.18	0.11	Ground Floor (0.11)	OK		
Roofs	0.16	0.09	Roof (1) (0.09)	OK		
Windows, doors,	1.6	1.2	Front East Door (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)	83.28	0.22		
Exposed wall: Walls (2)	6	0.21		
Party wall: Party Wall (1)	47.38	0 (!)		
Ground floor: Ground Floor, Ground Floor	48.8	0.11		
Exposed roof: Roof (1)	48.8	0.09 (!)		

2c Openings (better than typically exp Name	Area [m²]	Orientation	Frame factor	U-Value [W/m ² K]
Front East Door, New Dwell Entrance Door	2.01	West	N/A	1.2
Front East Windows, New Dwelling DG Window	2.73	West	0.7	1.2
Front East Window, New Dwelling DG Window	1.9	West	0.7	1.2
Side North Windows, New Dwelling DG Window	1.8	North	0.7	1.2
Rear West Windows, New Dwelling DG Window	3.94	East	0.7	1.2
Rear West Windows, New Dwell DG	3.92	East	0.7	1.2

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
French Doors				

	Main Dwelling: Thermal bridging ca	Iculated from linear thermal transmit		
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other	Calculated by person with suitable	0.05	IG or Keystone
	steel lintels)	expertise		Hi Therm +
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail

3 Air permeability (better than typically expected values are flagged with a subsequent (!))								
Maximum permitted air permeability at 50Pa 8 m³/hm²								
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK						
Air permeability test certificate reference								

4 Space heating								
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity								
Efficiency 233.7%								
Emitter type	Radiators							
Flow temperature	55°C							
System type	Heat Pump							
Manufacturer	Daikin Europe NV							
Model	EDLA04EV3							
Commissioning								
Secondary heating system: N/A								
Fuel	N/A							
Efficiency	N/A							
Commissioning								

5 Hot water			
Cylinder/store - type: Cylinder	1		
Capacity	180 litres		
Declared heat loss	1.39 kWh/day		
Primary pipework insulated	Yes		
Manufacturer			
Model			
Commissioning Waste water heat recovery system 1 -	tuno: NI/A		
Efficiency	type. N/A		
Manufacturer			
Model			
6 Controls			
	ature zone control by	arrangement of plumbing and electrical s	ervices
Function			
Ecodesign class			
Manufacturer			
Model	ot and UM congretaly	, timed	
Water heating - type: Cylinder thermosta	at and Hvv Separately	rumea	
Manufacturer Model			
7 Lighting			
Minimum permitted light source efficacy	75 lm/W		
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model			
Commissioning			
9 Local generation			
N/A			
10 Heat networks			
N/A			
11 Supporting documentary evidence			
N/A			
40 Dealers Comp			
12 Declarations			
a. Assessor Declaration	nfirmation that the ac	entents of this PDEL Compliance Benert	
		ontents of this BREL Compliance Report of this dwelling for	
		and that the supporting documentary	
evidence (SAP Conventions, Appendi			
documentary evidence required) has	,	•	
Compliance Report.	been reviewed in the	course or preparing this BILL	
Joniphanio Roporti			I
Signed:		Assessor ID:	
Name:		Date:	
b. Client Declaration			
N/A			

Predicted Energy Assessment



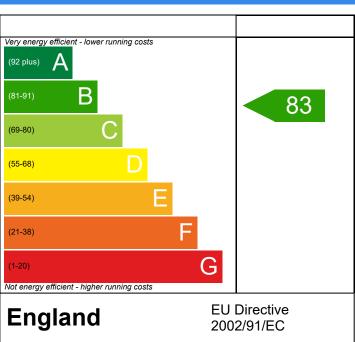
Plot 10, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Semi-Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 97.6 m²
DRRN: 8207-4328-6911

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.

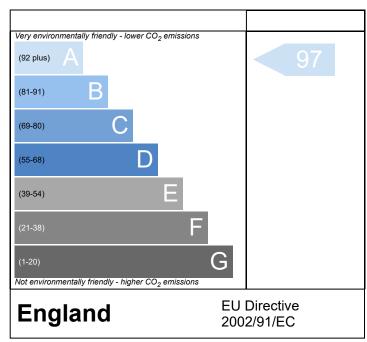
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc1002	37 P10 Bitterne C	Church					Issue	d on Da	te	06/12/20	23
Assessment Reference	001				Pro	p Type I	Ref	New D	welling			
Property	Plot 10,	Bitterne Parish 0	Church, Whites Lane, S	outhamp	oton, Har	npshire	SO19 7N	NP				
SAP Rating			83 B	DER		3.87			TER		10.53	
Environmental			97 A		R < TER	3.07			ILK		63.25	
CO ₂ Emissions (t/year)			0.31	DFEE	· · ILK	35.1	0		TFEE		36.85	
Compliance Check			See BREL		E < TFE		0				4.52	
% DPER < TPER			26.71	DPER	\ 11 .	40.2	6		TPER		54.94	
// DI EK \ II EK			20.71	DI LIK		40.2	U		II LIX		34.94	
Assessor Details	Mr. Mark Ro	gers							Assess	or ID	A320-	0001
Client	Vivid Design	Studio, Philip Du	ıdley									
SUMMARY FOR INPU	T DATA FOR	: New Build (As Designed)									
Orientation			West									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Semi-Detach	ed								
2.0 Number of Storeys			2									
3.0 Date Built			2023									
4.0 Sheltered Sides			2									
5.0 Sunlight/Shade			Average or unknown									
6.0 Thermal Mass Parame	ter		Precise calculation									
7.0 Electricity Tariff			Standard									
_	ittad		No									
Smart electricity meter f	illea		No									
Smart gas meter fitted			NO									
7.0 Measurements						erimete	r Int	ernal Fl		ı Av		orey Height
			Ground floo 1st Store		20.50 20.50			48.80 48.80			2.39 2.70	
8.0 Living Area			13.88						m²			
9.0 External Walls												
Description	Туре	Construction			Kappa		Nett Area		Shelte	er O	penings Ar	ea Calculatio
External Cavity Wall	Cavity Wall		pard on dabs or battens,	(W/m²K) 0.22	(kJ/m²K) 110.00	Area(m²) 97.68	(m²) 83.28	Res 0.00	None)	14.40 Ca	Type culate Wall Are
External Tile Hung Wall	Cavity Wall	outside structure	e block, filled cavity, any pard on dabs or battens,	0.21	110.00	7.90	6.00	0.00	None		1.90 Er	nter Gross Area
External file fluing wall	Cavity Wall		e block, filled cavity, any	0.21	110.00	7.50	0.00	0.00	None	•	1.50 Li	ilei Gioss Aiei
9.1 Party Walls												
Description	Туре	Construc	ction				U-Value					Shelter
Party Wall	Filled Cavity Edge Sealir		asterboard on dabs bot e blocks, cavity or cavit		ightweig	ht	(W/m²K) 0.00	(kJ/m²K 110.00	(m²) 47.38	Re	S	None
9.2 Internal Walls												
Description		Construct	ion								Kappa (kJ/m²K	Area (m²
Internal Stud Walls		Plasterboa	rd on timber frame								9.00	187.53
10.0 External Roofs	_	_				_	_					_
Description	Туре	Construction	l			Kappa kJ/m²K)/	Gross Area(m²)	Nett Area		Shelter Factor	Calculati Type	onOpening
External Pitched Roofs	External Plane Roof	e Plasterboard,	insulated at ceiling leve	•	0.09	9.00	48.80	(m²) 48.80	None	0.00	Calculate Wall Are	
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceiling								A	rea (m²) 48.80

SAP 10 Online 2.12.2 Page 1 of 3

11.0 Heat Loss Floors



Description	Туре	Storey Index	(Construction		U-Val (W/m²		Shelter Code		nelter Kapı actor (kJ/m	
Ground Floor	Ground Floor - Solid	Lowest occup	oied	Suspended concrete floor	r, carpeted	0.11		None		0.00 75.0	
11.2 Internal Floors Description		Storey Index	Cons	struction						Kappa (kJ/m²K)	Area (m²)
Internal Floor		aox	Plast	terboard ceiling, carpe	eted chipboard fl	oor				9.00	48.80
12.0 Opening Types	5.4.0	_				.			_	_	
Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Doo New Dwell DG French Doors	r Manufacturer Manufacturer	Half Glaze Window	ed Doo	Double Low-E				0.36 0.71		0.70 0.70	1.20 1.20
New Dwelling DG Window	w Manufacturer	Window		Double Low-E	Soft 0.05			0.71		0.70	1.20
13.0 Openings Name	Opening Ty	no		Location		Orienta	ntion	Aron	m2\	Di	tch
Front East Door Front East Windows Front East Window Side North Windows Rear West Windows Rear West Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin New Dwellin	ntrance Do g DG Windo g DG Windo g DG Windo g DG Windo g DG Windo	or ow ow ow	External Cavity Wall External Cavity Wall External Tile Hung W External Cavity Wall External Cavity Wall External Cavity Wall External Cavity Wall	'all	We: We: We: Nor Eas	st st st th	Area (2.0 2.7 1.9 1.8 3.9 3.9	1 3 0 0 4	F	icii
14.0 Conservatory				None							
15.0 Draught Proofing			Ī	100				%			
16.0 Draught Lobby			Ī	No							
17.0 Thermal Bridging 17.1 List of Bridges			L	Calculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E18 Party wall between o P1 Party wall - Ground flo P2 Party wall - Intermedia P4 Party wall - Roof (insu	nin a dwelling ceiling level) ceiling level) dwellings oor ate floor within a	dwelling	Inder Inder Inder Inder Inder Inder Inder Inder Inder Table	cee Type Dendently assessed	Length 11.46 10.50 28.80 20.50 20.50 18.52 1.98 10.30 10.30 9.20 9.20	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 0.04 0.10 0.00 0.10	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 0.04 0.10 0.00 0.10	d Reference: IG or Keyst Recognisec	one Hi Th I Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	No No No No No No No No
Y-value				0.00				W/m²K			
18.0 Pressure Testing				Yes							
Designed AP ₅₀			Ī	5.05				m³/(h.m	²) @ 50 P	'a	
Test Method			Ī	Blower Door							
19.0 Mechanical Ventilation	<u> </u>										
Mechanical Ventilation											
Mechanical Ventilat	tion System Pres	ent		No							
20.0 Fans, Open Fireplaces	, Flues										
21.0 Fixed Cooling System				No							
22.0 Lighting											
No Fixed Lighting				No							
			Low	Name energy Lighting	Efficacy 75.00		wer 5	Capa 112			ount 36
24.0 Main Heating 1			Г	Database							
Description				Electric Air Source He	eat Pump						
Percentage of Heat				100.00	•			%			
Database Ref. No.			Ī	106465							
Fuel Type			Ī	Electricity							
In Winter				0.00							
In Summer			Ī	0.00							
Model Name			Ī	EDLA04EV3							
			L								

SAP 10 Online 2.12.2 Page 2 of 3



Recommendations							
31.0 Thermal Store	None						
In Airing Cupboard	No						
Pipes insulation	Fully insulated primary pipework						
Loss Rings insulation	1.39	kWh/day					
Cylinder Volume	130	L kWh/day					
Insulation Type		1					
Independent Time Control	Yes Measured Loss						
Cylinder In Heated Space	Yes						
Cylinder In Hosted Space	Yes						
29.0 Hot Water Cylinder Cylinder Stat	Hot Water Cylinder						
	Hat Water Odindan						
28.3 Waste Water Heat Recovery System	[l/min] [kW]						
28.1 Showers Description Shower Type	Flow Rate Rated Power C	onnected Connected To					
Immersion Only Heating Hot Water	No						
Bath Count	No.						
Cold Water Source	From mains						
Water use <= 125 litres/person/day	Yes						
Solar Panel	No						
Waste Water Heat Recovery Storage System	No						
Waste Water Heat Recovery Instantaneous System 2	No						
Waste Water Heat Recovery Instantaneous System 1	No						
Flue Gas Heat Recovery System	No						
SAP Code	901						
Water Heating	Main Heating 1						
28.0 Water Heating							
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5	Ratio						
Heat Source Fuel Type Heating Us	Heat Power	trical Fuel Factor Efficiency type					
26.0 Heat Networks	None						
25.0 Main Heating 2	None						
Flow Temperature Value	55.00						
Flow Temperature	Enter value						
Heat Emitter	Radiators						
Heating Pump Age	2013 or later						
Is MHS Pumped	Pump in heated space						
PCDF Controls	0						
Controls SAP Code	2207						
System Type	Heat Pump						
Manufacturer	Daikin Europe NV						

Lower cost measures

None

Further measures to achieve even higher standards

SAP 10 Online 2.12.2 Page 3 of 3

Thermal Bridging



Property Reference	sc100237 P10 Bitterne	Issued on Date	06/12/2023							
Assessment Reference	001		Prop	Type Ref	Semi-Detached Hous	е				
Property	Plot 10, Bitterne Parish	Plot 10, Bitterne Parish Church, Whites Lane, Southampton, Hampshire , SO19 7NP								
SAP Rating 83 B DER 3.87					TER	10.53				
Environmental	Environmental 97 A % DER < TER			63.2 63.2 63.2 63.2 63.2 63.2 63.2 63.2						
CO ₂ Emissions (t/year)		0.31	DFEE	35.18	TFEE	36.85				
Compliance Check		See BREL	% DFEE < TFEE 4.52							
% DPER < TPER		26.71	DPER	40.26	TPER	54.94				
Assessor Details	Mr. Mark Rogers Assessor ID A320-0001									
Client	Vivid Design Studio, Philip D	Vivid Design Studio, Philip Dudley								

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	11.46	0.57	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	10.50	0.19	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.80	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	20.50	1.39	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	20.50	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.52	1.02	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	1.98	0.11	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.20	0.95	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.20	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.20	0.93	Recognised Construction Detail

Total: 160.46 W/mK: Y-Value: 0.00 W/m²K:

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc121841				Issued on Date	06/12/2023		
Assessment Reference	001		Prop Type Ref	op Type Ref New Dwelling Part L 2021				
Project	Plot 10, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19	7NP		
Calculation Type	New Build (As Designed)							
SAP Rating 88 B DE				13.43	TER	25.18		
Environmental		89 B	% DER <ter< th=""><th></th><th>46.67</th><th></th></ter<>		46.67			
CO ₂ Emissions (t/year)		1.02	DFEE	41.21	TFEE	52.36		
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>21.30</th><th></th></tfe<>	E	21.30			
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-						A320-0001		
Client	d Design Studio, Vivid Desi	gn Studio						

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness	Conductivity	Resistance	Fraction
		(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Startesistance. Opper mine = 11.445 iii ky w

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference				Issued on Date	06/12/2023			
Assessment Reference	Prop Type Ref			New Dwelling Part L 2021				
Project	Plot 10, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP							
Calculation Type	New Build (As Designed)							
SAP Rating	88 B	DER	13.43	TER	25.18			
Environmental	89 B	% DER <ter< th=""><th></th><th colspan="5">46.67</th></ter<>		46.67				
CO ₂ Emissions (t/year)	D ₂ Emissions (t/year) 1.02 DFEE 41.21 TFEE 5				52.36			
General Requirements	Pass	% DFEE <tfe< th=""><th>E</th><th colspan="5">21.30</th></tfe<>	E	21.30				
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001								
Client	Client Vivid Design Studio, Vivid Design Studio							

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500	125	0.0340	3.6765	100.00
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121841	sc121841			Issued on Date	06/12/2023	
Assessment Reference	001	001 Pr			Type Ref New Dwelling Part L 2021		
Project	Plot 10, Bitterne Parish C	Plot 10, Bitterne Parish Church, Whites Lane, Bitterne, Southampton,			Hampshire , SO19 7	'NP	
Calculation Type	New Build (As Designed)	New Build (As Designed)					
SAP Rating 88 B DER 13.43 TER			25.18				
Environmental		89 B	% DER <ter< th=""><th></th><th colspan="3">46.67</th></ter<>		46.67		
CO ₂ Emissions (t/ye	ar)	1.02	DFEE	41.21	41.21 TFEE 52.36		
General Requireme	eneral Requirements Compliance Pass % DFEE <tfee 21.30<="" th=""><th></th></tfee>						
Assessor Details	1r. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001					A320-0001	
Client	/ivid Design Studio, Vivid Desi	gn Studio					

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

.ayer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
xt surface		()	(**/)	0.0400	(/0/
ayer 1	Tile Hanging				
•	Main construction	15	1.0000	0.0150	100.00
er 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity: Normal				
3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
er 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500				
r 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
er 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
urface				0.1300	

Average = 4.75 iii kyw

 $\textbf{Total correction} = 0.0016 \ \text{m}^2 \ \text{K/W} \\ \textbf{U-value (unrounded)} = 0.21 \ \text{W/m}^2 \ \text{K}$

Unheated space: None

Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a





Property Reference	sc121841	sc121841			Issued on Date	06/12/2023	
Assessment Reference	001			Prop Type Ref	rop Type Ref New Dwelling Part L 2021		
Project	Plot 10, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hamps				Hampshire , SO19 7	'NP	
Calculation Type	New Build (As Designed)						
SAP Rating	P Rating 88 B DER 13.43 TER			25.18			
Environmental		89 B	% DER <ter< th=""><th></th><th colspan="3">46.67</th></ter<>		46.67		
CO ₂ Emissions (t/year)		1.02	DFEE	41.21	41.21 TFEE 52.36		
General Requirements Compliance Pass % DFEE <tfee 21.30<="" th=""><th></th></tfee>							
Assessor Details Mr.	ssor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001					A320-0001	
Client	id Design Studio, Vivid Desi	gn Studio					

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 48.80 m², Perimeter = 20.50 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description		Thickness	Conductivity	Resistance	Fraction
Layer	Description		(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface					0.1700	
Layer 1	Blockwork					
	Main construction		100	0.1900	0.5263	90.91
	Main construction		100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor					
	Main construction		150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Faste	ners: None or				
	plastic					
Layer 3	Screed					
	Main construction		75	1.1500	0.0652	100.00
Int surface					0.1700	
Total resistanc	e: Upper limit = 7.709 m ² K/W	Lower limit =	7.603 m²	K/W	Average =	7.656 m ² K,
	Total correction = 0.0079 m ² K/W		U-value (ı	unrounded) =	0.11 W/m ²	K
Unheated sr	ace: None					

U-value: 0.11 W/m² K Total thickness: 325 mm Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 11, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference sc121842 Issued of Assessment Reference Property Plot 11, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire		
Reference		12/2023
	lling Part L 2021	
	e , SO19 7NP	
SAP Rating 88 B DER 13.19 TER		24.78
	16.78	
CO ₂ Emissions (t/year) 1.00 DFEE 39.99 TFEE		51.03
General Requirements Compliance Pass % DFEE <tfee 2<="" td=""><td>21.63</td><td></td></tfee>	21.63	
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk	ssor ID A3	20-0001
Client Vivid Design Studio, Vivid Design Studio		
ENE 1 - Dwelling Emission Rate calculation		
Total floor area 97.6	m²	
DER 13.19	kgCO ₂ /yr/m ²	
TER 24.78	kgCO ₂ /yr/m ²	
CO ₂ emissions offset from additional allowable electricity generation 0.00	kgCO ₂ /yr/m ²	(ZC7)
Residual CO ₂ emissions offset from biofuel CHP 0.00	kgCO ₂ /yr/m ²	(ZC5)
Total CO₂ emissions offset from SAP Section 16 allowances 0.00	kgCO ₂ /yr/m ²	
DER accounting for SAP Section 16 allowances	kgCO ₂ /yr/m ²	
Reduction DER/TER 46.78	%	
CfSH ENE1 credits achieved 5.2		
CfSH ENE1 level achieved 4		
ENE 2 – Fabric Energy Efficiency calculation		_
Dwelling type House, Semi-Detac		
	kWh/m²/yr	
CfSH ENE2 credits achieved 8.5		
CfSH ENE1 and 2 overall level achieved 4		
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation 4		
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions	m²	
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area 97.6	m² kgCO ₂ /vr/m²	
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area DER 18.30	kgCO ₂ /yr/m²	(7(2)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area DER CO ₂ emissions from electrical appliances 4 15.32	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC2)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area 97.6 DER 97.6 CO ₂ emissions from electrical appliances 15.32 CO ₂ emissions from cooking 1.89	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area DER CO ₂ emissions from electrical appliances CO ₂ emissions from cooking Standard case total CO ₂ emissions	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area 97.6 DER 18.30 CO ₂ emissions from electrical appliances 15.32 CO ₂ emissions from cooking 1.89 Standard case total CO ₂ emissions 15.51 Net Standard case CO ₂ emissions 35.51	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area DER CO ₂ emissions from electrical appliances CO ₂ emissions from cooking Standard case total CO ₂ emissions Net Standard case CO ₂ emissions Actual case CO ₂ emissions	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area DER CO ₂ emissions from electrical appliances CO ₂ emissions from cooking Standard case total CO ₂ emissions Net Standard case CO ₂ emissions DER Actual case CO ₂ emissions DER 14 97.6 18.30 15.32 15.32 15.32 15.32 16.31	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area 97.6 DER 18.30 CO ₂ emissions from electrical appliances 15.32 CO ₂ emissions from cooking 1.89 Standard case total CO ₂ emissions Net Standard case CO ₂ emissions 35.51 Actual case CO ₂ emissions DER 16.31 CO ₂ emissions from electrical appliances 15.32	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area 97.6 DER 18.30 CO ₂ emissions from electrical appliances 15.32 CO ₂ emissions from cooking 1.89 Standard case total CO ₂ emissions Net Standard case CO ₂ emissions Net Standard case CO ₂ emissions DER 16.31 CO ₂ emissions from electrical appliances 15.32 CO ₂ emissions from electrical appliances 15.32 CO ₂ emissions from electrical appliances 15.32 CO ₂ emissions from cooking 1.89	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8)
CfSH ENE1 and 2 overall level achieved ENE 7 - Low and Zero Carbon Technologies calculation Standard case CO ₂ emissions Total floor area DER CO ₂ emissions from electrical appliances CO ₂ emissions from cooking Standard case total CO ₂ emissions Net Standard case CO ₂ emissions Net Standard case CO ₂ emissions DER CO ₂ emissions from electrical appliances CO ₂ emissions DER CO ₂ emissions from electrical appliances DER CO ₂ emissions from electrical appliances CO ₂ emissions from cooking Actual case total CO ₂ emissions 33.52	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3)
CfSH ENE1 and 2 overall level achieved ENE7 - Low and Zero Carbon Technologies calculation Standard case CO2 emissions Total floor area DER CO2 emissions from electrical appliances CO2 emissions from cooking Standard case total CO2 emissions Net Standard case CO2 emissions Net Standard case CO2 emissions DER CO2 emissions from electrical appliances CO3 emissions DER CO4 emissions from electrical appliances CO5 emissions from electrical appliances CO6 emissions from cooking Actual case total CO6 emissions CO9 emissions from cooking Actual case total CO9 emissions CO9 emissions from Biomass	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)
CfSH ENE1 and 2 overall level achieved ENE 7 – Low and Zero Carbon Technologies calculation Standard case CO2 emissions Total floor area DER CO2 emissions from electrical appliances CO2 emissions from cooking Standard case total CO2 emissions Net Standard case total CO2 emissions Net Standard case CO2 emissions DER CO2 emissions from electrical appliances CO3 emissions from electrical appliances DER CO4 emissions from electrical appliances CO5 emissions from cooking Actual case total CO2 emissions CO2 emissions from Belectrical appliances CO3 emissions from cooking Actual case total CO2 emissions CO2 emissions from Biomass CO3 reduction from additional allowable electricity generation D.00	kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)



CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:29:32

Project Information			
Assessed By	Mark Rogers	Building Type	House, Semi-detached
OCDEA Registration	EES/004179	Assessment Date	2023-12-06

Dwelling Details					
Assessment Type	As designed	Total Floor Area	98 m ²		
Site Reference	sc100238 P11 Bitterne	Plot Reference	001		
	Church				
Address	Bitterne Parish Church Plot 11	Bitterne Parish Church Plot 11 Whites Lane, Southampton, SO19 7NP			

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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

1a Target emission rate and dwelling emission	rate	
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	10.31 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	3.8 kgCO ₂ /m ²	OK
1b Target primary energy rate and dwelling prin	mary energy	
Target primary energy	53.76 kWh _{PE} /m ²	
Dwelling primary energy	39.53 kWh _{PE} /m ²	OK
1c Target fabric energy efficiency and dwelling	fabric energy efficiency	
Target fabric energy efficiency	35.8 kWh/m ²	
Dwelling fabric energy efficiency	34.1 kWh/m ²	ОК

2a Fabric U-values	;			
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	Walls (1) (0.22)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.11	Ground Floor (0.11)	OK
Roofs	0.16	0.09	Roof (1) (0.09)	OK
Windows, doors,	1.6	1.2	Front East Door (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)	83.28	0.22		
Exposed wall: Walls (2)	6	0.21		
Party wall: Party Wall (1)	47.38	0 (!)		
Ground floor: Ground Floor, Ground Floor	48.8	0.11		
Exposed roof: Roof (1)	48.8	0.09 (!)		

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]						
Front East Door, New Dwell Entrance	2.01	West	N/A	1.2						
Door										
Front East Windows, New Dwelling DG	2.73	West	0.7	1.2						
Window										
Front East Window, New Dwelling DG	1.9	West	0.7	1.2						
Window										
Side South Windows, New Dwelling DG	1.8	South	0.7	1.2						
Window										
Rear West Windows, New Dwelling DG	3.94	East	0.7	1.2						
Window										
Rear West Windows, New Dwell DG	3.92	East	0.7	1.2						
I	I	I	I	1						

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
French Doors				

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))									
	Main Dwelling: Thermal bridging ca			n junction					
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference					
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +					
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail					
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail					
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail					
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail					
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail					
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised Construction Detail					
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail					
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail					
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.103	Recognised Construction Detail					
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)						
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail					

3 Air permeability (better than typically expected values are flagged with a subsequent (!))								
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²							
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK						
Air permeability test certificate reference								

4 Space heating								
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity								
Efficiency	233.7%							
Emitter type	Radiators							
Flow temperature	55°C							
System type	Heat Pump							
Manufacturer	Daikin Europe NV							
Model	EDLA04EV3							
Commissioning								
Secondary heating system: N/A								
Fuel	N/A							
Efficiency	N/A							
Commissioning								

5 Hot water			
Cylinder/store - type: Cylinder			
Capacity	180 litres		
Declared heat loss	1.39 kWh/day		
Primary pipework insulated	Yes		
Manufacturer			
Model			
Commissioning			
Waste water heat recovery system 1 -	type: N/A		
Efficiency			
Manufacturer			
Model			
6 Controls			
	ature zone control by	arrangement of plumbing and electrical se	ervices
Function		and gomest of pramoting and ordenical o	
Ecodesign class			
Manufacturer			
Model			
Water heating - type: Cylinder thermosta	at and HW separately	timed	
Manufacturer		- 	
Model			
7 Lighting	l —— , , , , , , ,		
Minimum permitted light source efficacy	75 lm/W		
Lowest light source efficacy	75 lm/W		OK
External lights control	N/A		
8 Mechanical ventilation			
System type: N/A			
Maximum permitted specific fan power	N/A		
Specific fan power	N/A		N/A
Minimum permitted heat recovery	N/A		1
efficiency			
Heat recovery efficiency	N/A		N/A
Manufacturer/Model			•
Commissioning			
O Local generation	•		
9 Local generation N/A			
IN/A			
10 Heat networks			
N/A			
11 Supporting documentary evidence			
N/A			
12 Declarations			
a. Assessor Declaration			
		ontents of this BREL Compliance Report	
		nformation submitted for this dwelling for	
		, and that the supporting documentary	
evidence (SAP Conventions, Append	`	,	
documentary evidence required) has	been reviewed in the	course of preparing this BREL	
Compliance Report.		T	
O'con a de		A ID	
Signed:		Assessor ID:	
Name		Data	
Name:		Date:	
h Client Declaration			
b. Client Declaration N/A			
IN/ <i>P</i> A			

Predicted Energy Assessment



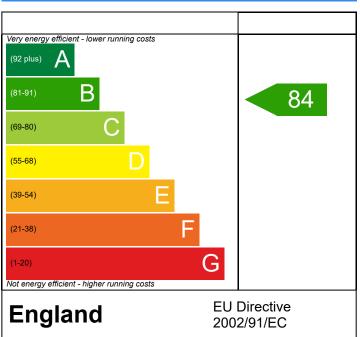
Plot 11, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Semi-Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 97.6 m²
DRRN: 9207-7023-6925

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.

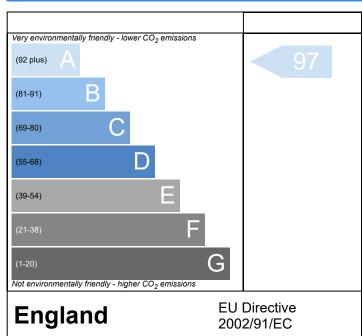
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc1002	38 P11 Bitterne	Church					Issue	d on Dat	e	06/12/2	023
Assessment Reference	001				Pro	p Type I	Ref	New Dv	velling			
Property	Plot 11	, Bitterne Parish	Church, Whites Lane, S	Southamp	ton, Han	npshire ,	SO19 7N	IP				
SAP Rating			84 B	DER		3.80			TER		10.3	1
Environmental			97 A	% DEF	R < TER						63.1	
CO ₂ Emissions (t/year)			0.31	DFEE		34.1	0		TFEE		35.8	5
Compliance Check			See BREL	% DFE	E < TFE						4.86	
% DPER < TPER			26.46	DPER		39.5	3		TPER		53.7	6
Assessor Details	Mr. Mark Ro	a a ro							Assess	or ID	A 2 2 (0-0001
Client		n Studio, Philip [Oudley						A336330	01 10	A320	J-000 I
SUMMARY FOR INPU		•										
	T DAIATON	. New Dulla										
Orientation			West									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Semi-Detach	ied								
2.0 Number of Storeys			2									
3.0 Date Built			2023									
4.0 Sheltered Sides			2									
5.0 Sunlight/Shade			Average or unknown									
6.0 Thermal Mass Parame	ter		Precise calculation									
7.0 Electricity Tariff			Standard									
Smart electricity meter f	itted		No									
Smart gas meter fitted			No									
7.0 Measurements												
			Ground floo	r:	t Loss Po 20.50	m	r Int	ernal Flo 48.80	m²	Av	2.	storey Heigh 39 m
			1st Store	y:	20.50	m		48.80	m²		2.	76 m
8.0 Living Area			13.88					r	n²			
9.0 External Walls	T	0		11.1/-1	K	0	N - 44 A	0114	0111-			 Oalasslad
Description External Cavity Wall	Type Cavity Wall	Construction Cavity wall: plaster	board on dabs or battens,		Kappa (kJ/m²K) 110.00		Nett Area (m²) 83.28	Res 0.00	Shelte			Area Calculation Type Salculate Wall A
External davity Wall	Cavity Wall		ate block, filled cavity, any	0.22	110.00	07.00	00.20	0.00	140110		14.40	aloulate Wall /
External Tile Hung Wall	Cavity Wall	Cavity wall; plaster	board on dabs or battens, ate block, filled cavity, any	0.21	110.00	7.90	6.00	0.00	None		1.90	Enter Gross Are
9.1 Party Walls												
	Type	Constr	uction				U-Value (W/m²K)		Area) (m²)	Shel Re		Shelter
Description				h sides. I	ightweigl	ht	0.00	110.00	47.38		•	None
Description Party Wall	Filled Cavit Edge Seali		plasterboard on dabs bo ate blocks, cavity or cavi									
•												
Party Wall			ate blocks, cavity or cavi								Kappa (kJ/m²	
Party Wall 9.2 Internal Walls		ng aggrega Construe	ate blocks, cavity or cavi								Kapp (kJ/m ²) 9.00	K) .
Party Wall 9.2 Internal Walls Description		ng aggrega Construe	ate blocks, cavity or cavi								(kJ/m²	K) .
Party Wall 9.2 Internal Walls Description Internal Stud Walls		ng aggrega Construe	ate blocks, cavity or cavi	ty fill U	I-Value I						(kJ/m²l 9.00 Calcula	(K) 187.53 ationOpenin
Party Wall 9.2 Internal Walls Description Internal Stud Walls 10.0 External Roofs	Edge Seali	Construction	ate blocks, cavity or cavi	ty fill U (V			Gross Area(m²) 48.80	Nett 5 Area (m²) 48.80	Shelter : Code None		(kJ/m² l 9.00	tionOpenine ate 0.00

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11.0 Heat Loss Floors



Description	Туре	Storey Index		Construction		U-Valı (W/m²		Shelter Code		elter Kapp ctor (kJ/m	
Ground Floor	Ground Floor - Solid	Lowest occup	oied S	Suspended concrete floor	, carpeted	0.11		None	0	.00 75.0	0 48.80
11.2 Internal Floors Description		Storey Index	Const	ruction						Kappa (kJ/m²K)	
Internal Floor			Plaste	rboard ceiling, carpe	eted chipboard fl	oor				9.00	48.80
12.0 Opening Types	Data Source	Type		Glazina		Glazina	Filling	G value	Eromo	Eromo	II Value
Description New Dwell Entrance Doc	Data Source or Manufacturer	Type Half Glaze	ed Door			Glazing Gap	Filling Type	G-value 0.36	Frame Type	Frame Factor 0.70	U Value (W/m ² K) 1.20
New Dwell DG French Doors New Dwelling DG Windo	Manufacturer	Window Window		Double Low-E S				0.71 0.71		0.70 0.70	1.20 1.20
	w Manufacturer	Williaow		Double Low-E	5011 0.05			0.71		0.70	1.20
13.0 Openings Name Front East Door Front East Windows Front East Window Side South Windows Rear West Windows Rear West Windows	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin New Dwell D	entrance Do g DG Windo g DG Windo g DG Windo g DG Windo g DG Windo	or E ow E ow E ow E ow E	ocation xternal Cavity Wall xternal Cavity Wall xternal Tile Hung W xternal Cavity Wall xternal Cavity Wall xternal Cavity Wall	all	Orienta Wes Wes Sout Eas Eas	st st st th tt	Area (2.01 2.73 1.90 1.80 3.94 3.92)))	Pi	tch
14.0 Conservatory			N	one							
15.0 Draught Proofing				00				%			
16.0 Draught Lobby			N					= "			
				-							
17.0 Thermal Bridging 17.1 List of Bridges			С	alculate Bridges							
Bridge Type E2 Other lintels (including E3 Sill E4 Jamb E5 Ground floor (normal) E6 Intermediate floor with E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E18 Party wall between of P1 Party wall - Ground floor P2 Party wall - Intermedi P4 Party wall - Roof (insu	nin a dwelling ceiling level) ceiling level) dwellings oor ate floor within a	, dwelling	Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper Indeper	e Type endently assessed	Length 11.46 10.50 28.80 20.50 20.50 18.52 1.98 10.30 10.30 9.20 9.20	Psi 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	Adjusted 0.05 0.02 0.01 0.07 0.00 0.06 0.05 0.04 0.10 0.00 0.10	d Reference: IG or Keystr Recognised	Construct Construct Construct Construct Construct Construct Construct Construct Construct Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	No No No No No No No
Y-value			0.	.00				W/m²K			
18.0 Pressure Testing			Ye	es							
Designed AP50			5.	.05				m³/(h.m²	²) @ 50 P	а	
Test Method			В	lower Door							
19.0 Mechanical Ventilation	1										
Mechanical Ventilation			_					_			
Mechanical Ventila	tion System Pres	ent	N	0							
20.0 Fans, Open Fireplaces	s, Flues										
21.0 Fixed Cooling System			N	0							
22.0 Lighting											
No Fixed Lighting			N								
			Low e	Name energy Lighting	Efficacy 75.00	Po \ 1		Capa 112			ount 36
24.0 Main Heating 1			D	atabase							
Description			E	lectric Air Source He	eat Pump			_			
Percentage of Heat			10	00.00				%			
Database Ref. No.			10	06465							
Fuel Type			E	lectricity				$\overline{}$			
In Winter				.00				Ħ			
In Summer				.00				Ħ			
Model Name			E	DLA04EV3				Ħ			
				-							

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Manufacturer	Daikin Europe NV	1
System Type	Heat Pump]
Controls SAP Code	2207]
PCDF Controls	0]
]
Is MHS Pumped	Pump in heated space]
Heating Pump Age	2013 or later]
Heat Emitter	Radiators]
Flow Temperature	Enter value]
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None]
Heat Source Fuel Type Heating U Heat source 1 Heat source 2 Heat source 3 Heat source 4	se Efficiency Percentage Of Heat Heat Ele Heat Power Ratio	ctrical Fuel Factor Efficiency type
Heat source 5		
28.0 Water Heating Water Heating	Main Heating 1	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]
·	No]
Waste Water Heat Recovery Storage System Solar Panel]
	No No]
Water use <= 125 litres/person/day	Yes]
Cold Water Source	From mains]
Bath Count]
Immersion Only Heating Hot Water	No	
28.1 Showers Description Shower Typ	e Flow Rate Rated Power([l/min] [kW]	Connected Connected To
28.3 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 Type	Measured Loss]
Cylinder Volume	180.00	L
Loss	1.39	kWh/day
Dinas insulation	Fully insulated primary pipework]
Pipes insulation	7 1 711	
Pipes insulation In Airing Cupboard	No	
]

Further measures to achieve even higher standards

Ratings after improvement rating Environmental Impact **Typical Cost** Typical savings per year SAP rating B 85 B 91 £4,000 - £6,000 £3,500 - £5,500 £47 £196 A 97 A 98 0

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Thermal Bridging



Property Reference	sc100238 P11 Bitterne	Church	Issued on Date	06/12/2023					
Assessment Reference	001		Prop	Type Ref	Semi-Detached House	е			
Property	Plot 11, Bitterne Parish	Plot 11, Bitterne Parish Church, Whites Lane, Southampton, Hampshire , SO19 7NP							
SAP Rating	84 B	DER	3.80	TER	10.31				
Environmental	97 A	% DER < TER	63.14						
CO ₂ Emissions (t/year)		0.31	DFEE	34.10	TFEE	35.85			
Compliance Check		See BREL	% DFEE < TFEE			4.86			
% DPER < TPER		26.46	DPER	39.53	TPER	53.76			
Assessor Details Mr. Mark Rogers Assessor ID A320-0001									
Client	Vivid Design Studio, Philip D	/ivid Design Studio, Philip Dudley							

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	11.46	0.57	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	10.50	0.19	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	28.80	0.40	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	20.50	1.39	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	20.50	0.02	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	18.52	1.02	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	1.98	0.11	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	10.30	0.53	Recognised Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	Recognised Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.103	9.20	0.95	Recognised Construction Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.20	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.101	9.20	0.93	Recognised Construction Detail

Total: 160.46 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121842	sc121842							
Assessment Reference	e 001			Prop Type Ref	New Dwelling Part L	2021			
Project	Plot 11, Bitterne Parish C	Plot 11, Bitterne Parish Church, Whites Lane, Bitterne, Southamptor							
Calculation Type	New Build (As Designed)	New Build (As Designed)							
SAP Rating		88 B	DER	13.19	TER	24.78			
Environmental		89 B	% DER <ter< th=""><th></th><th>46.78</th><th></th></ter<>		46.78				
CO ₂ Emissions (t/ye	ear)	1.00	DFEE	39.99	TFEE	51.03			
General Requireme	ents Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>21.63</th><th></th></tfe<>	E	21.63				
Assessor Details	sor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001								
Client	Vivid Design Studio, Vivid Desi	gn Studio							

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Startesistance. Opper limit = 11.445 iii iy v

Total correction = 0.0030 m² K/W U-value (unrounded) = 0.09 W/m² K

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121842	sc121842			Issued on Date	06/12/2023		
Assessment Reference	e 001	001			op Type Ref New Dwelling Part L 2021			
Project	Plot 11, Bitterne Parish C	hurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP		
Calculation Type	New Build (As Designed)							
SAP Rating		88 B	DER	13.19	TER	24.78		
Environmental		89 B	% DER <ter< th=""><th></th><th>46.78</th><th></th></ter<>		46.78			
CO ₂ Emissions (t/ye	1.00	DFEE	39.99	TFEE	51.03			
General Requirements Compliance Pass % DFEE <tfee< th=""><th>E</th><th>21.63</th><th></th></tfee<>			E	21.63				
Assessor Details	r. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0003					A320-0001		
Client	Vivid Design Studio, Vivid Desi	gn Studio	<u>'</u>	<u>'</u>		-		

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		. ,		0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500	125	0.0340	3.6765	100.00
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121842	sc121842			Issued on Date	06/12/2023
Assessment Reference	001	001 Prop T			New Dwelling Part L	2021
Project	Plot 11, Bitterne Parish C	hurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP
Calculation Type	New Build (As Designed)					
SAP Rating		88 B	DER	13.19	TER	24.78
Environmental		89 B	% DER <ter< th=""><th></th><th>46.78</th><th></th></ter<>		46.78	
CO ₂ Emissions (t/year) 1.00			DFEE	39.99	TFEE	51.03
General Requirements Compliance Pass % DFEE <tfee 21.63<="" th=""><th></th></tfee>						
Assessor Details	r. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001				A320-0001	
Client	ivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
ayer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
yer 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
yer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
er 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
yer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
er 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
surface				0.1300	

Average = 4.75 iii kyw

Total correction = $0.0016 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.21 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a





Property Reference	sc121842				Issued on Date	06/12/2023		
Assessment Reference	001			Prop Type Ref	rop Type Ref New Dwelling Part L 2021			
Project	Plot 11, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP		
Calculation Type	New Build (As Designed)							
SAP Rating		88 B	DER	13.19	TER	24.78		
Environmental		89 B	% DER <ter< th=""><th></th><th>46.78</th><th></th></ter<>		46.78			
CO ₂ Emissions (t/year)		1.00	DFEE	39.99	TFEE	51.03		
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th colspan="4">21.63</th></tfe<>	E	21.63			
Assessor Details Mr.	Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001					A320-0001		
Client	id Design Studio, Vivid Desi	gn Studio						

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 48.80 m², Perimeter = 20.50 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Lavor	yer Description		Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m^2K/W)	(%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: No	ne or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W Low	er limit = 7.603 m ²	K/W	Average =	7.656 m² K
	Total correction = 0.0079 m ² K/W	U-value (unrounded) =	0.11 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.11 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 12, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121843				Issued on Date	06/12/2023
Assessment	001			Prop Type Ref	New Dwelling Part L 2	
Reference				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Property	Plot 12, Bitterne Pari	sh Church, Whites	Lane, Bitterne,	Southampton,	Hampshire , SO19 7N	Р
SAP Rating		85 B	DER	15.54	TER	25.39
Environmental		86 B	% DER <ter< td=""><td></td><td>38.79</td><td></td></ter<>		38.79	
CO ₂ Emissions (t/ye	ear)	1.53	DFEE	46.47	TFEE	57.72
General Requireme	ents Compliance	Pass	% DFEE <tfe< td=""><td></td><td>19.50</td><td></td></tfe<>		19.50	
Assessor Details	Mr. Mark Rogers, Sureca mark@surecalc.co.uk	lc Limited, Tel: 012	243572695,		Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid	d Design Studio				
	ission Rate calculation	a Besign staals				
Total floor area				122.1	m²	
DER				15.54	kgCO ₂ /yr/ı	m²
TER				25.39	kgCO ₂ /yr/ı	
	ffset from additional allow	vable electricity ge	neration	0.00	kgCO ₂ /yr/ı	
	nissions offset from biofue	, 0	incración.	0.00	kgCO ₂ /yr/l	
	ions offset from SAP Section			0.00	kgCO ₂ /yr/l	
				15.54	kgCO ₂ /yr/l	
DER accounting for SAP Section 16 allowances					116002/11/	
_					%	
Reduction DER/	TER			38.79	%	
_	TER ts achieved			38.79 4.5	%	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level	TER ts achieved			38.79	%	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level	TER ts achieved achieved			38.79 4.5		
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ	TER ts achieved achieved gy Efficiency calculation			38.79 4.5 4		
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ Dwelling type	ts achieved achieved gy Efficiency calculation ciciency (F.E.E.)			38.79 4.5 4 House, D	etached	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 — Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit	ts achieved achieved gy Efficiency calculation ciciency (F.E.E.)			38.79 4.5 4 House, D 46.47	etached	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2	ts achieved achieved gy Efficiency calculation ciciency (F.E.E.)			38.79 4.5 4 House, D 46.47 6.8	etached	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2	ts achieved achieved gy Efficiency calculation ciciency (F.E.E.) as achieved overall level achieved ro Carbon Technologies ca			38.79 4.5 4 House, D 46.47 6.8	etached	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 — Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zer	ts achieved achieved gy Efficiency calculation ciciency (F.E.E.) as achieved overall level achieved ro Carbon Technologies ca			38.79 4.5 4 House, D 46.47 6.8	etached	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer	ts achieved achieved gy Efficiency calculation ciciency (F.E.E.) as achieved overall level achieved ro Carbon Technologies ca			38.79 4.5 4 House, D 46.47 6.8	etached kWh/m²/yr	
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER	ts achieved achieved gy Efficiency calculation ciciency (F.E.E.) as achieved overall level achieved ro Carbon Technologies ca			38.79 4.5 4 House, D 46.47 6.8 4	etached kWh/m²/yr	n²
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 – Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) ss achieved overall level achieved ro Carbon Technologies calculation			38.79 4.5 4 House, D 46.47 6.8 4	etached kWh/m²/yr m² kgCO₂/yr/n	n² n² (ZC2)
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 — Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zet Standard case CO ₂ e Total floor area DER CO ₂ emissions fro	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) ss achieved overall level achieved ro Carbon Technologies calculation			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n	n² n² (ZC2) n² (ZC3)
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 — Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zet Standard case CO ₂ e Total floor area DER CO ₂ emissions fro	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) ss achieved overall level achieved ro Carbon Technologies calculation emissions om electrical appliances om cooking tal CO ₂ emissions			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n	n² n² (ZC2) n² (ZC3) n² (ZC4)
Reduction DER/ CfSH ENE1 credi CfSH ENE1 level ENE 2 — Fabric Energ Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro Standard case to Net Standard case	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) as achieved overall level achieved ro Carbon Technologies calculation om electrical appliances om cooking tal CO ₂ emissions achieved			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n	n² n² (ZC2) n² (ZC3) n² (ZC4)
Reduction DER/ CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zet Standard case CO2 et Total floor area DER CO2 emissions from Standard case to Net Standard case	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) as achieved overall level achieved ro Carbon Technologies calculation om electrical appliances om cooking tal CO ₂ emissions achieved			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n	n² n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC8)
Reduction DER/ CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zet Standard case CO2 et Total floor area DER CO2 emissions fro Standard case to Net Standard case Actual case CO2 emi DER	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) as achieved overall level achieved ro Carbon Technologies calculation om electrical appliances om cooking tal CO ₂ emissions achieved			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45 34.45	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n	n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC8)
Reduction DER/ CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zel Energy Total floor area DER CO2 emissions fro CO2 emissions fro Standard case to Net Standard case Actual case CO2 emi DER	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) ss achieved overall level achieved ro Carbon Technologies calculation om electrical appliances om cooking tal CO ₂ emissions se CO ₂ emissions for electrical appliances om electrical appliances om electrical appliances			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45 34.45	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n	n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC8)
Reduction DER/ CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zet Standard case CO2 et Total floor area DER CO2 emissions from Standard case to Net Standard case Actual case CO2 emissions from DER CO2 emissions from Standard case to Net Standard case Actual case CO2 emissions from	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) as achieved overall level achieved ro Carbon Technologies calculation om electrical appliances om cooking tal CO ₂ emissions as CO ₂ emissions as CO ₂ emissions as cooking om electrical appliances om cooking			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45 34.45 15.76 13.97	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n	n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC8) n² (ZC8)
Reduction DER/ CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zel Standard case CO2 errors Total floor area DER CO2 emissions fro Standard case to Net Standard case to Net Standard case Actual case CO2 emi DER CO2 emissions fro CO2 emissions fro Standard case to Net Standard case CO2 emissions fro	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) ss achieved overall level achieved ro Carbon Technologies calculations om electrical appliances om cooking tal CO ₂ emissions se CO ₂ emissions om electrical appliances om cooking com cooking com cooking de CO ₂ emissions			38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45 34.45 15.76 13.97 1.54	etached kWh/m²/yr m² kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n kgCO₂/yr/n	n² n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC8) n² (ZC8) n² (ZC2) n² (ZC2) n² (ZC2) n² (ZC3)
Reduction DER/ CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case to Net Standard case to Net Standard case ENE CO2 emissions from CO2 emissions from CO3 emissions from CO4 emissions from CO5 emissions from CO5 emissions from CO6	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) ss achieved overall level achieved ro Carbon Technologies calculations om electrical appliances om cooking tal CO ₂ emissions se CO ₂ emissions om electrical appliances om cooking com cooking com cooking de CO ₂ emissions	alculation	on	38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45 34.45 15.76 13.97 1.54 31.27	etached m² kgCO₂/yr/n	n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC8) n² (ZC2) n² (ZC3) n² (ZC2) n² (ZC3) n² (ZC3) n² (ZC4)
Reduction DER/ CfSH ENE1 credic CfSH ENE1 level ENE 2 — Fabric Energy Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 — Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case to Net Standard case to Net Standard case ENE CO2 emissions from CO2 emissions from CO3 emissions from CO4 emissions from CO5 emissions from CO5 emissions from CO6	ts achieved achieved gy Efficiency calculation ficiency (F.E.E.) as achieved overall level achieved ro Carbon Technologies calculations om electrical appliances om cooking tal CO ₂ emissions as e CO ₂ emissions for electrical appliances om cooking CO ₂ emissions as a point appliances om cooking CO ₂ emissions om electrical appliances om cooking CO ₂ emissions om additional allowable electrical allowable electrical appliances	alculation	on	38.79 4.5 4 House, D 46.47 6.8 4 122.1 18.94 13.97 1.54 34.45 34.45 15.76 13.97 1.54 31.27 0.00	etached m² kgCO₂/yr/n kgCO₂/yr/n	n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC8) n² (ZC2) n² (ZC2) n² (ZC2) n² (ZC3) n² (ZC4) n² (ZC5) n² (ZC7)



CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:30:19

Project Information					
Assessed By	Mark Rogers	Building Type	House, Detached		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details			
Assessment Type	As designed	Total Floor Area	122 m ²
Site Reference	sc100239 P12 Bitterne	Plot Reference	001
	Church		
Address	Bitterne Parish Church Plot 12	Whites Lane, Southampton, SC	D19 7NP

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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

1a Target emission rate and dwelling emission	rate						
Fuel for main heating system	Electricity						
Target carbon dioxide emission rate	10.62 kgCO ₂ /m ²						
Dwelling carbon dioxide emission rate	3.88 kgCO ₂ /m ²	OK					
1b Target primary energy rate and dwelling primary energy							
Target primary energy	55.6 kWh _{PE} /m ²						
Dwelling primary energy	40.29 kWh _{PE} /m ²	OK					
1c Target fabric energy efficiency and dwelling fabric energy efficiency							
Target fabric energy efficiency	41.6 kWh/m ²	_					
Dwelling fabric energy efficiency	40.4 kWh/m ²	OK					

2a Fabric U-values										
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m²K]	Element with highest individual U-Value							
External walls	0.26	0.22	Walls (1) (0.22)	OK						
Party walls	0.2	N/A	N/A	N/A						
Curtain walls	1.6	N/A	N/A	N/A						
Floors	0.18	0.12	Ground Floor (0.12)	OK						
Roofs	0.16	0.09	Roof (1) (0.09)	OK						
Windows, doors,	1.6	1.2	Front West Door (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)	137.21	0.22						
Exposed wall: Walls (2)	8.59	0.21						
Ground floor: Ground Floor, Ground Floor	61.05	0.12						
Exposed roof: Roof (1)	61.05	0.09 (!)						

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]					
Front West Door, New Dwell Entrance	2.01	West	N/A	1.2					
Door									
Front West Windows, New Dwelling DG	4.41	West	0.7	1.2					
Window									
Front West Window, New Dwelling DG	1.9	West	0.7	1.2					
Window									
Side North Windows, New Dwelling DG	1.8	North	0.7	1.2					
Window									
Rear East Windows, New Dwelling DG	4.92	East	0.7	1.2					
Window									
Rear West Windows, New Dwell DG	3.35	East	0.7	1.2					
French Doors									

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
Side North Door, New Dwell Entrance	1.95	North	N/A	1.2
Door				

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))									
Building part 1 -	Main Dwelling: Thermal bridging ca	alculated from linear thermal transmit	tances for each j	unction					
Main element	Junction detail	Source	Psi value	Drawing /					
			[W/mK]	reference					
External wall	E2: Other lintels (including other	Calculated by person with suitable	0.05	IG or Keystone					
	steel lintels)	expertise		Hi Therm +					
External wall	E3: Sill	Calculated by person with suitable	0.018 (!)	Recognised					
		expertise		Construction					
				Detail					
External wall	E4: Jamb	Calculated by person with suitable	0.014 (!)	Recognised					
		expertise		Construction					
				Detail					
External wall	E5: Ground floor (normal)	Calculated by person with suitable	0.068	Recognised					
		expertise		Construction					
				Detail					
External wall	E6: Intermediate floor within a	Calculated by person with suitable	0.001 (!)	Recognised					
	dwelling	expertise		Construction					
				Detail					
External wall	E10: Eaves (insulation at ceiling	Calculated by person with suitable	0.055	Recognised					
	level)	expertise		Construction					
				Detail					
External wall	E12: Gable (insulation at ceiling	Calculated by person with suitable	0.058	Recognised					
	level)	expertise		Construction					
				Detail					
External wall	E16: Corner (normal)	Calculated by person with suitable	0.051	Recognised					
		expertise		Construction					
				Detail					
External wall	E17: Corner (inverted - internal	Calculated by person with suitable	-0.1	Recognised					
	area greater than external area)	expertise		Construction					
				Detail					

3 Air permeability (better than typically expected values are flagged with a subsequent (!))							
Maximum permitted air permeability at 50Pa 8 m³/hm²							
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK					
Air permeability test certificate reference							

4 Space heating						
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity						
Efficiency	241.8%					
Emitter type	Radiators					
Flow temperature	55°C					
System type	Heat Pump					
Manufacturer	Daikin Europe NV					
Model	EDLA06EV3					
Commissioning						
Secondary heating system: N/A						
Fuel	N/A					
Efficiency	N/A					
Commissioning						

5 Hot water							
Cylinder/store - type: Cylinder							
Capacity	210 litres						
Declared heat loss	1.5 kWh/day						
Primary pipework insulated	Yes						
Manufacturer							
Model							
Commissioning							
Waste water heat recovery system 1 - type: N/A							
Efficiency							
Manufacturer							
Model							

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model T Lighting Minimum permitted light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System type: N/A Maximum permitted specific fan power N/A Maximum permitted specific fan power N/A Minimum permitted sheat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report. Signed: Assessor ID:				
Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Maximum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	6 Controls			
Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W OK External lights control N/A 8 Mechanical ventilation System type: N/A N/A Maximum permitted specific fan power N/A N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical s	ervices
Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Minimum permitted specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Function			
Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 Im/W Lowest light source efficacy 75 Im/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Ecodesign class			
Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7. Lighting Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W System type: N/A N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9. Local generation N/A 10. Heat networks N/A 11. Supporting documentary evidence N/A 12. Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Manufacturer			
Manufacturer Model A	Model			
Manufacturer Model A	Water heating - type: Cylinder thermosta	at and HW separately	timed	
Model 7 Lighting Minimum permitted light source efficacy 75 lm/W		, , , , , , , , , , , , , , , , , , ,		
Minimum permitted light source efficacy 75 Im/W OK External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Minimum permitted light source efficacy 75 Im/W OK External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Lowest light source efficacy 75 Im/W N/A 8 Mechanical ventilation N/A 8 Mechanical ventilation N/A System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		·		
External lights control 8 Mechanical ventilation System type: IVA Maximum permitted specific fan power				
8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Lowest light source efficacy	75 lm/W		OK
System type: N/A Maximum permitted specific fan power Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	External lights control	N/A		
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### Heat recovery efficiency ### N/A ### N				IN/A
Heat recovery efficiency N/A N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		IN/A		
Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		NI/A		N/A
9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	-	N/A		N/A
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evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	the purpose of carrying out the "As de	signed" assessment,	and that the supporting documentary	
documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Compliance Report.	1	,	· · · · · · · · · · · · · · · · · · ·	
	. ,		area ar proporning and arrang	
Signed: Assessor ID:				1
Signed: Assessor ID:				
Added to 1.	Signed:		Assessor ID:	
	Oigrica.		/10000001 ID.	
Nomo:	Namo		Data:	
Name: Date:	INAILIE.		Date.	
h Client Declaration	h Client Declaration			

N/A

Predicted Energy Assessment



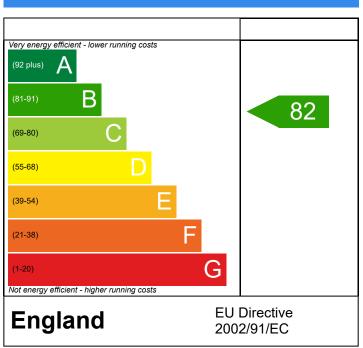
Plot 12, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 122.1 m²
DRRN: 0207-8321-6995

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.

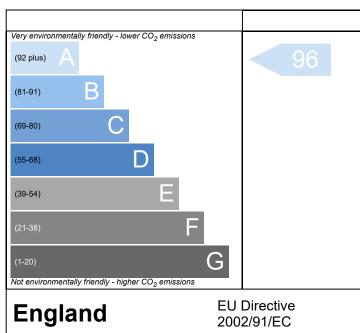
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

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Property Reference	sc100	239 P12 Bitterne C	hurch					Issue	d on Da	te	06/12/202	3
Assessment Reference	001				Pro	ор Туре	Ref	New D	welling			
Property	Plot 12	2, Bitterne Parish C	Church, Whites Lane, S	outham	oton, Ha	mpshire	, SO19 7I	NP				
SAP Rating			82 B	DER		3.8	3		TER		10.62	
Environmental			96 A		R < TER						63.47	
CO ₂ Emissions (t/year)			0.39	DFEE		40.	12		TFEE		41.61	
Compliance Check			See BREL	% DFE	E < TFE						2.87	
% DPER < TPER			27.53	DPER		40.:	29		TPER		55.60	
Assessor Details	Mr. Mark D								Assess	or ID	A320-0	2004
Client	Mr. Mark R	n Studio, Philip Du	ıdlev						Assess	OI ID	A320-0	J00 I
SUMMARY FOR INPL		•										
	DIDAIATOI	1. New Dullu (F										
Orientation			West									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Detached									
2.0 Number of Storeys			2									
3.0 Date Built			2023									
4.0 Sheltered Sides			2									
5.0 Sunlight/Shade	.4		Average or unknown									
6.0 Thermal Mass Parame	eter		Precise calculation									
7.0 Electricity Tariff			Standard									
Smart electricity meter	fitted		No									
Smart gas meter fitted			No									
7.0 Measurements							_		_	_		
			Ground floo	r:	t Loss F 32.26	m	er in	ternal Fl 61.05	i m²	ı A	2.39	
			1st Store	/ :	32.26	5 m		61.05	i m²		2.76	m
8.0 Living Area			15.46						m²			
9.0 External Walls												
Description	Туре	Construction) (kJ/m²K) Area(m²		Res	Shelte			ea Calculation Type
External Cavity Wall	Cavity Wall		ard on dabs or battens, block, filled cavity, any	0.22	110.00	155.65	137.21	0.00	None	9	18.44 Cald	culate Wall Are
External Tile Hung Wall	Cavity Wall	Cavity wall; plasterbo	e block, filled cavity, any	0.21	110.00	10.49	8.59	0.00	None	е	1.90 En	ter Gross Area
9.1 Party Walls												
Description	Type	Construc	tion				U-Value (W/m²K)	Kappa		She Re		Shelter
Party Wall	Filled Cavi Edge Seal		sterboard on dabs bot blocks, cavity or cavit		lightweig	ght	0.00	110.00			.5	None
9.2 Internal Walls												
Description		Constructi	ion								Kappa (kJ/m²K)	Area (m²
Internal Stud Walls Internal Block Walls			rd on timber frame ck, plasterboard on dab	s							9.00 75.00	180.27 68.12
10.0 External Roofs											_	
Description	Туре	Construction			J-Value W/m²K)(Gross Area(m²)			Shelter Factor		onOpening
External Pitched Roofs	External Plar Roof	ne Plasterboard,	insulated at ceiling lev	-	0.09	9.00	61.05	(m²) 61.05	None	0.00	Calculate Wall Area	
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceiling	a cornot	and ohinh	oord flo						r ea (m²) 61.05

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11.0 Heat Loss Floors											
Description	Туре	Storey Index	c	Construction		U-Valu (W/m²k		Shelter Code		elter Kap ctor (kJ/m	oa Area(m²) ²K)
Ground Floor	Ground Floor - Solid	Lowest occup	ied S	Suspended concrete floor,	carpeted	0.12		None	0	.00 75.0	0 61.05
11.2 Internal Floors Description		Storey Index	Const	ruction						Kappa (kJ/m²K)	
Internal Floor			Plaste	rboard ceiling, carpe	ted chipboard floo	or				9.00	61.05
12.0 Opening Types											
Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Doo New Dwell DG French Doors	or Manufacturer Manufacturer	Half Glaze Window	d Door	Double Low-E S Double Low-E S		·		0.36 0.71	,,	0.70 0.70	1.20 1.20
New Dwelling DG Windo	w Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
Name Front West Door Front West Windows Front West Window Side North Windows Rear East Windows Rear West Windows Side North Door	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin New Dwell E New Dwell E	Entrance Doo g DG Windo g DG Windo g DG Windo g DG Windo DG French D	or E ow E ow E ow E ow E	ocation xternal Cavity Wall xternal Cavity Wall xternal Tile Hung Wa xternal Cavity Wall	all	Orienta Wes Wes Wes North East East North	t t t	Area (2.0° 4.4° 1.90 1.80 4.92 3.35 1.95	1 1)) 2 5	Pi	tch
14.0 Conservatory			N	one							
15.0 Draught Proofing			10	00				%			
16.0 Draught Lobby			N	0							
47.0 Th annual D				-landata Dail							
17.0 Thermal Bridging 17.1 List of Bridges			C	alculate Bridges							
E2 Other lintels (includin E3 Sill E4 Jamb E5 Ground floor (normal E6 Intermediate floor wit E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E17 Corner (inverted – in external area)) hin a dwelling ceiling level) ceiling level)	,	Indeper Indeper Indeper Indeper Indeper Indeper Indeper	endently assessed endently assessed	14.53 13.57 33.30 32.26 32.26 29.36 2.90 25.38 4.78	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	IG or Keysto Recognised Recognised Recognised Recognised Recognised Recognised Recognised	Constructions Construction Cons	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	No No No No No
Y-value			0.	00				W/m²K			
18.0 Pressure Testing			Ye	es							
Designed AP ₅₀			5.	05				m³/(h.m²	²) @ 50 Pa	а	
Test Method			ВІ	lower Door							
19.0 Mechanical Ventilation	n										
Mechanical Ventilation								\neg			
Mechanical Ventila	tion System Pres	ent	N	0							
20.0 Fans, Open Fireplace	s, Flues										
21.0 Fixed Cooling System	1		N	0							
22.0 Lighting								_			
No Fixed Lighting			N		F##				-14	•	4
			Low e	Name energy Lighting	Efficacy 75.00	Pow 15		Capa 112			ount 36
24.0 Main Heating 1			D	atabase							
Description			E	lectric Air Source He	at Pump			<u>-</u>			
Percentage of Heat			10	00.00				%			
Database Ref. No.			10	06473							
Fuel Type			EI	lectricity							
In Winter			0.	00							
In Summer			0.	00							
Model Name			E	DLA06EV3				$\bar{\Box}$			

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Manufacturar	Deikin Europe MV	
Manufacturer	Daikin Europe NV	
System Type	Heat Pump	
Controls SAP Code	2207	
PCDF Controls	0	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None	
Heat Source Fuel Type Heating Us Heat source 1 Heat source 2 Heat source 3 Heat source 4	se Efficiency Percentage Of Heat Heat Elec Heat Power Ratio	trical Fuel Factor Efficiency type
Heat source 5		
28.0 Water Heating	Main Heating 1	
Water Heating SAP Code	Main Heating 1 901	
	No	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1		
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	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.1 Showers Description Shower Type	Flow Rate Rated Power C [l/min] [kW]	connected Connected To
28.3 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 Type	Measured Loss	
Cylinder Volume	210.00	L
Loss	1.50	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	
31.0 Thermal Store	None	
Recommendations		

Lower cost measures

None

Further measures to achieve even higher standards

Ratings after improvement rating Environmental Impact **Typical Cost** Typical savings per year SAP rating
B 83
B 88 £4,000 - £6,000 £3,500 - £5,500 £48 £206 A 96 A 97 0

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Thermal Bridging



Property Reference	sc100239 P12 Bitterne	Church		Is	sued on Date	06/12/2023
Assessment Reference	001		Prop	Type Ref Det	ached House	
Property	Plot 12, Bitterne Parish	Church, Whites Lane	, Southampton, Han	npshire , SO19 7NP		
SAP Rating		82 B	DER	3.88	TER	10.62
Environmental		96 A	% DER < TER			63.47
CO ₂ Emissions (t/year)		0.39	DFEE	40.42	TFEE	41.61
Compliance Check		See BREL	% DFEE < TFEE			2.87
% DPER < TPER		27.53	DPER	40.29	TPER	55.60
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001
Client	Vivid Design Studio, Philip D	udley				

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	14.53	0.73	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	13.57	0.24	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	33.30	0.47	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	32.26	2.19	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	32.26	0.03	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	29.36	1.61	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	2.90	0.17	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	25.38	1.29	Recognised Construction Detail
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.100	4.78	-0.48	Recognised Construction Detail

Total: 188.34 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121843				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 12, Bitterne Parish C	hurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	7NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.54	TER	25.39
Environmental		86 B	% DER <ter< th=""><th></th><th>38.79</th><th></th></ter<>		38.79	
CO ₂ Emissions (t/ye	ar)	1.53	DFEE	46.47	TFEE	57.72
General Requireme	nts Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.50</th><th></th></tfe<>	E	19.50	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	nited, Tel: 0124	13572695, ma	rk@surecalc.co.ı	uk Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Total correction = 0.0030 fill k/W O-value (unrounded) = 0.09 W/iii i

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121843				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 12, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.54	TER	25.39
Environmental		86 B	% DER <ter< th=""><th></th><th>38.79</th><th></th></ter<>		38.79	
CO ₂ Emissions (t/year)		1.53	DFEE	46.47	TFEE	57.72
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.50</th><th></th></tfe<>	E	19.50	
Assessor Details Mr.	Mark Rogers, Surecalc Lim	ited, Tel: 0124	13572695, ma	rk@surecalc.co.u	Assessor ID	A320-0001
Client	id Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm ² , Lambda: 17.000 W/m.K, per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121843				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 12, Bitterne Parish C	hurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	7NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.54	TER	25.39
Environmental		86 B	% DER <ter< th=""><th></th><th>38.79</th><th></th></ter<>		38.79	
CO ₂ Emissions (t/yea	r)	1.53	DFEE	46.47	TFEE	57.72
General Requiremen	ts Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.50</th><th></th></tfe<>	E	19.50	
Assessor Details N	1r. Mark Rogers, Surecalc Lim	ited, Tel: 0124	13572695, ma	rk@surecalc.co.เ	ık Assessor ID	A320-0001
Client	ivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
ayer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
ayer 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
.ayer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1300	

Total correction = $0.0016 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.21 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a





Property Reference	sc121843				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 12, Bitterne Parish Cl	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.54	TER	25.39
Environmental		86 B	% DER <ter< th=""><th></th><th>38.79</th><th></th></ter<>		38.79	
CO ₂ Emissions (t/year)		1.53	DFEE	46.47	TFEE	57.72
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.50</th><th></th></tfe<>	E	19.50	
Assessor Details Mr.	Mark Rogers, Surecalc Lim	ited, Tel: 0124	3572695, ma	rk@surecalc.co.u	Assessor ID	A320-0001
Client	id Design Studio, Vivid Desi	gn Studio				

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 61.05 m², Perimeter = 32.26 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness	Conductivity		
	20011011	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners:	None or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W L	ower limit = 7.603 m ²	<td>Average =</td> <td>7.656 m²</td>	Average =	7.656 m²
	Total correction = 0.0079 m ² K/W	U-value (ւ	ınrounded) =	0.12 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.12 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 13, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121844				Issued on Date 0	6/12/2023
Assessment	001		F	Prop Type Ref	New Dwelling Part L 202	1
Reference						
Property	Plot 13, Bitterne Parish C	hurch, Whites	Lane, Bitterne, S	Southampton, I	Hampshire , SO19 7NP	
SAP Rating		85 B	DER	15.35	TER	25.05
Environmental		86 B	% DER <ter< td=""><td></td><td>38.73</td><td></td></ter<>		38.73	
CO₂ Emissions (t/ye	ar)	1.52	DFEE	45.42	TFEE	56.60
General Requireme	nts Compliance	Pass	% DFEE <tfee< td=""><td></td><td>19.77</td><td></td></tfee<>		19.77	
Assessor Details	Mr. Mark Rogers, Surecalc Li mark@surecalc.co.uk	mited, Tel: 012	243572695,		Assessor ID A	320-0001
Client	Vivid Design Studio, Vivid De	sign Studio				
ENE 1 - Dwelling Emi	ission Rate calculation					
Total floor area				122.1	m²	
DER				15.35	kgCO ₂ /yr/m ²	
TER				25.05	kgCO ₂ /yr/m ²	
CO ₂ emissions of	ffset from additional allowable	e electricity ge	neration	0.00	kgCO ₂ /yr/m ²	(ZC7)
Residual CO₂ em	issions offset from biofuel CH	Р		0.00	kgCO ₂ /yr/m ²	(ZC5)
Total CO₂ emissi	ons offset from SAP Section 1	6 allowances		0.00	kgCO ₂ /yr/m ²	
DER accounting f	for SAP Section 16 allowances	;		15.35	kgCO ₂ /yr/m ²	
Reduction DER/T	ΓER			38.73	%	
CfSH ENE1 credit	ts achieved			4.5		
CfSH ENE1 level	achiovod					
CISH ENET level	acilieveu			4		
	y Efficiency calculation			4		
				House, D	etached	
ENE 2 – Fabric Energ	y Efficiency calculation				etached kWh/m²/yr	
ENE 2 – Fabric Energ	y Efficiency calculation			House, D		
ENE 2 – Fabric Energ Dwelling type Fabric energy effi CfSH ENE2 credits	y Efficiency calculation			House, D		
ENE 2 – Fabric Energ Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2	y Efficiency calculation ciency (F.E.E.) s achieved	ation		House, D. 45.42		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, D. 45.42		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, D. 45.42		
Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, D. 45.42 7.1	kWh/m²/yr	
ENE 2 – Fabric Energy Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul	ation		House, D. 45.42 7.1 4	kWh/m²/yr	(ZC2)
ENE 2 – Fabric Energy Dwelling type Fabric energy effi CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER	y Efficiency calculation ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC2) (ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97	m ² kgCO ₂ /yr/m ²	
ENE 2 – Fabric Energy Dwelling type Fabric energy effit CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions fro	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54	kWh/m²/yr	(ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ energy Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case total	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 34.15	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from CO ₂ emissions from Standard case tot Net Standard case	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 34.15	m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ² kgCO ₂ /yr/m ²	(ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case tot Net Standard case Actual case CO ₂ emissions DER	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 34.15	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case tot Net Standard case Actual case CO ₂ emissions DER	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions essions om electrical appliances	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 34.15	m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m²	(ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case total Net Standard case Actual case CO ₂ emissions from DER CO ₂ emissions from Standard case total Net Standard case CO ₂ emissions from DER CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calculumissions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 34.15 15.56 13.97	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER CO ₂ emissions from Standard case CO ₂ emissions from CO ₂ emissions from DER CO ₂ emissions from CO ₂ emissions from CO ₂ emissions from CO ₂ emissions from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking cooking cooking cooking	ation		House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 34.15 15.56 13.97 1.54	m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m² kgCO2/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC2)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER CO ₂ emissions from Standard case total Net Standard case total CO ₂ emissions from Actual case total CO ₂ emissions from CO ₂ reduction from	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking com cooking om electrical appliances om additional allowable electrical		n	House, D. 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 15.56 13.97 1.54 31.07	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO2 er Total floor area DER CO2 emissions from Standard case total Net Standard case DER CO2 emissions from Standard case total CO2 emissions from Actual case total CO2 emissions from Actual case total CO2 reduction from Net Actual case CO2	ciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions om electrical appliances om cooking com cooking om electrical appliances om additional allowable electrical	icity generatio	n	House, D 45.42 7.1 4 122.1 18.64 13.97 1.54 34.15 34.15 15.56 13.97 1.54 31.07 0.00	m² kgCO2/yr/m²	(ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5)



CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:30:58

Project Information				
Assessed By	Mark Rogers	Building Type	House, Detached	
OCDEA Registration	EES/004179	Assessment Date	2023-12-06	

Dwelling Details				
Assessment Type	As designed	Total Floor Area	122 m ²	
Site Reference	sc100240 P13 Bitterne	Plot Reference	001	
	Church			
Address	Bitterne Parish Church Plot 13 Whites Lane, Southampton, SO19 7NP			

Client Details		
Name	Philip Dudley	
Company	Vivid Design Studio	
Address	NA, NA, NA	

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

1a Target emission rate and dwelling emission	rate			
Fuel for main heating system	Electricity			
Target carbon dioxide emission rate	10.43 kgCO ₂ /m ²			
Dwelling carbon dioxide emission rate	3.82 kgCO ₂ /m ²	OK		
1b Target primary energy rate and dwelling primary energy				
Target primary energy	54.56 kWh _{PE} /m ²			
Dwelling primary energy	39.67 kWh _{PE} /m ²	OK		
1c Target fabric energy efficiency and dwelling fabric energy efficiency				
Target fabric energy efficiency	40.7 kWh/m ²			
Dwelling fabric energy efficiency	39.5 kWh/m ²	OK		

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	Walls (1) (0.22)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.12	Ground Floor (0.12)	OK
Roofs	0.16	0.09	Roof (1) (0.09)	OK
Windows, doors,	1.6	1.2	Front West Door (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)	137.21	0.22	
Exposed wall: Walls (2)	8.59	0.21	
Ground floor: Ground Floor, Ground Floor	61.05	0.12	
Exposed roof: Roof (1)	61.05	0.09 (!)	

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]
Front West Door, New Dwell Entrance	2.01	West	N/A	1.2
Door				
Front West Windows, New Dwelling DG	4.41	West	0.7	1.2
Window				
Front West Window, New Dwelling DG	1.9	West	0.7	1.2
Window				
Side South Windows, New Dwelling DG	1.8	South	0.7	1.2
Window				
Rear East Windows, New Dwelling DG	4.92	East	0.7	1.2
Window				
Rear West Windows, New Dwell DG	3.35	East	0.7	1.2
French Doors				

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
Side South Door, New Dwell Entrance	1.95	South	N/A	1.2
Door				

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))										
		alculated from linear thermal transmit		junction						
Main element	Junction detail	Source	Psi value	Drawing /						
			[W/mK]	reference						
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm +						
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail						
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail						
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.068	Recognised Construction Detail						
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail						
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail						
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised Construction Detail						
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail						
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.1	Recognised Construction Detail						

3 Air permeability (better than typically expected values are flagged with a subsequent (!))							
Maximum permitted air permeability at 50Pa	8 m³/hm²						
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK					
Air permeability test certificate reference							

4 Space heating								
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity								
Efficiency 241.8%								
Emitter type	Radiators							
Flow temperature	55°C							
System type	Heat Pump							
Manufacturer	Daikin Europe NV							
Model	EDLA06EV3							
Commissioning								
Secondary heating system: N/A								
Fuel	N/A							
Efficiency	N/A							
Commissioning								

5 Hot water							
Cylinder/store - type: Cylinder							
Capacity	210 litres						
Declared heat loss	1.5 kWh/day						
Primary pipework insulated	Yes						
Manufacturer							
Model							
Commissioning							
Waste water heat recovery system 1	- type: N/A						
Efficiency							
Manufacturer							
Model							

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model T Lighting Minimum permitted light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System type: N/A Maximum permitted specific fan power N/A Maximum permitted specific fan power N/A Minimum permitted sheat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report. Signed: Assessor ID:				
Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Maximum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	6 Controls			
Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W OK External lights control N/A 8 Mechanical ventilation System type: N/A N/A Maximum permitted specific fan power N/A N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical s	ervices
Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Minimum permitted specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Function			
Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 Im/W Lowest light source efficacy 75 Im/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Ecodesign class			
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Manufacturer Model A	Model			
Manufacturer Model A	Water heating - type: Cylinder thermosta	at and HW separately	timed	
Model 7 Lighting Minimum permitted light source efficacy 75 lm/W		, , , , , , , , , , , , , , , , , , ,		
Minimum permitted light source efficacy 75 Im/W OK External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
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Lowest light source efficacy 75 Im/W N/A 8 Mechanical ventilation N/A 8 Mechanical ventilation N/A System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		·		
External lights control 8 Mechanical ventilation System type: IVA Maximum permitted specific fan power				
8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Lowest light source efficacy	75 lm/W		OK
System type: N/A Maximum permitted specific fan power Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	External lights control	N/A		
System type: N/A Maximum permitted specific fan power Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	8 Mechanical ventilation			
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### Heat recovery efficiency ### N/A ### N				IN/A
Heat recovery efficiency N/A N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		IN/A		
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evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	the purpose of carrying out the "As de	signed" assessment,	and that the supporting documentary	
documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Compliance Report.	1	,	· · · · · · · · · · · · · · · · · · ·	
	. ,		area ar proporning and arrang	
Signed: Assessor ID:				1
Signed: Assessor ID:				
Added to 1.	Signed:		Assessor ID:	
	Oigrica.		/10000001 ID.	
Nomo:	Namo		Data:	
Name: Date:	INAILIE.		Date.	
h Client Declaration	h Client Declaration			

N/A

Predicted Energy Assessment



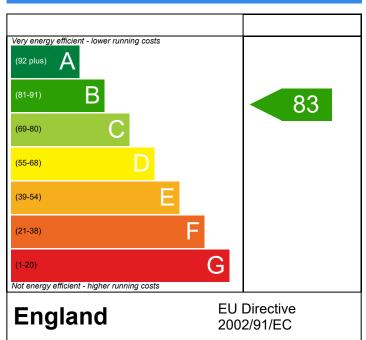
Plot 13, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 122.1 m²
DRRN: 6207-1128-6981

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.

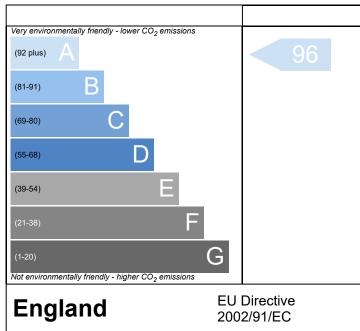
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc100240 P13 Bitterne Church									te	06/12/202	3
Assessment Reference	001 Prop Type Ref New								New Dwelling			
Property	Plot 13	, Bitterne Parish C	Church, Whites Lane, S	outhamp	oton, Ha	mpshire	, SO19 7I	NP				
SAP Rating			83 B	DER		3.82	2		TER		10.43	
Environmental			96 A	% DEF	R < TER						63.37	
CO ₂ Emissions (t/year)			0.39	DFEE		39.4	16		TFEE		40.73	
Compliance Check			See BREL	% DFE	E < TFE	E					3.13	
% DPER < TPER			27.30	DPER		39.6	67		TPER		54.56	
Assessor Details	Mr. Mark Ro	ogers							Assess	or ID	A320-0	0001
Client		n Studio, Philip Du	ıdley									
SUMMARY FOR INPL	JT DATA FOR	: New Build (A	As Designed)									
Orientation			West									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Detached									
2.0 Number of Storeys			2									
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									
7.0 Electricity Tariff			Standard									
Smart electricity meter	fitted		No									
Smart gas meter fitted			No									
7.0 Measurements												
			Ground floo		t Loss F 32.26	Perimete	r In	ternal FI 61.05	oor Area	ı Av	erage Sto 2.39	rey Height
			1st Store		32.26			61.05			2.76	
8.0 Living Area			15.46						m²			
9.0 External Walls												
Description	Туре	Construction			Kappa (kJ/m²K	Gross) Area(m²	Nett Area (m²)	Shelter Res	Shelte	er O		a Calculation
External Cavity Wall	Cavity Wall	lightweight aggregate	pard on dabs or battens, be block, filled cavity, any	0.22	110.00	155.65	137.21	0.00	None	9	18.44 Calc	ulate Wall Ar
External Tile Hung Wall	Cavity Wall		pard on dabs or battens, be block, filled cavity, any	0.21	110.00	10.49	8.59	0.00	None	9	1.90 Ent	ter Gross Area
9.1 Party Walls												
Description	Type	Construc	ction					Kappa (kJ/m²K		Shel Re		Shelter
Party Wall	Filled Cavi Edge Seali		asterboard on dabs bot e blocks, cavity or cavit		ightweig	ght	0.00	110.00				None
9.2 Internal Walls	-		-									
Description		Construct	ion								Kappa (kJ/m²K)	Area (m
Internal Stud Walls Internal Block Walls			rd on timber frame ck, plasterboard on dab	s							9.00 75.00	180.27 68.12
10.0 External Roofs	Tune	Compturedie			l Velo-	Kann-	Grass	Nass	Chaltar	Chalt-	Calaulati	n∩==!
Description	Туре	Construction	ı			Kappa kJ/m²K)	Gross Area(m²)	Area		Factor	Calculation Type	onopenin
External Pitched Roofs	External Plan Roof	e Plasterboard,	insulated at ceiling leve	el	0.09	9.00	61.05	(m²) 61.05	None	0.00	Calculate Wall Area	
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceiling									ea (m²) 61.05

SAP 10 Online 2.12.2 Page 1 of 3



11.0 Heat Loss Floors											
Description	Туре	Storey Index	C	Construction		U-Valu (W/m²ł		Shelter Code		elter Kap ctor (kJ/m	pa Area (m²) ¹²K)
Ground Floor	Ground Floor - Solid	Lowest occup	ied S	Suspended concrete floor,	r, carpeted	0.12		None	0	.00 75.0	00 61.05
11.2 Internal Floors Description		Storey Index	Const	ruction						Kappa (kJ/m²K)	
Internal Floor			Plaste	rboard ceiling, carpe	eted chipboard floo	or				9.00	61.05
12.0 Opening Types											
Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Doo New Dwell DG French Doors	or Manufacturer Manufacturer	Half Glaze Window	d Door	Double Low-E S Double Low-E S		·	•	0.36 0.71	,,	0.70 0.70	1.20 1.20
New Dwelling DG Windo	w Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
Name Front West Door Front West Windows Front West Window Side South Windows Rear East Windows Rear West Windows Side South Door	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwell E New Dwell E	Entrance Doo g DG Windo g DG Windo g DG Windo g DG Windo DG French D	or E ow E ow E ow E ow E ow E	ocation xternal Cavity Wall xternal Tile Hung Wa xternal Cavity Wall xternal Cavity Wall xternal Cavity Wall xternal Cavity Wall xternal Cavity Wall	all	Orienta Wes Wes Wes Soutl East East Soutl	t t t	Area (2.0° 4.4° 1.90° 1.80° 4.92° 3.35° 1.95°	1 1 0 0 2 5	P	itch
14.0 Conservatory			N	one				\neg			
15.0 Draught Proofing			-	00				" %			
16.0 Draught Lobby			N					Ħ			
17.0 Thermal Bridging 17.1 List of Bridges			С	alculate Bridges							
E2 Other lintels (includin E3 Sill E4 Jamb E5 Ground floor (normal E6 Intermediate floor wit E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E17 Corner (inverted – in external area)) hin a dwelling ceiling level) ceiling level)	,	Indeper Indeper Indeper Indeper Indeper Indeper Indeper	endently assessed endently assessed	14.53 13.57 33.30 32.26 32.26 29.36 2.90 25.38 4.78	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	IG or Keysto Recognised Recognised Recognised Recognised Recognised Recognised Recognised	Construct Construct Construct Construct Construct Construct Construct	tion Detai tion Detai tion Detai tion Detai tion Detai tion Detai tion Detai	I No I No I No I No I No
Y-value			0.	.00				W/m²K			
18.0 Pressure Testing			Ye	es							
Designed AP ₅₀			5.	.05				m³/(h.m²	²) @ 50 P	а	
Test Method			В	lower Door							
19.0 Mechanical Ventilation	n										
Mechanical Ventilation								\neg			
Mechanical Ventila		ent 	N	0							
20.0 Fans, Open Fireplace	s, Flues										
21.0 Fixed Cooling System	1 		N	0							
22.0 Lighting											
No Fixed Lighting			N	o Name	Efficacy	Pow		Como	altu	C.	n t
			Low e	energy Lighting	Efficacy 75.00	15		Capa 112			ount 36
24.0 Main Heating 1			D	atabase							
Description			E	lectric Air Source He	eat Pump						
Percentage of Heat			10	00.00				%			
Database Ref. No.			10	06473							
Fuel Type			E	lectricity							
In Winter			0.	.00							
In Summer			0.	.00							
Model Name			E	DLA06EV3				$\bar{\Box}$			
			_								

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Manufacturer	Daikin Europe NV	
System Type	Heat Pump	
Controls SAP Code	2207	
PCDF Controls	0	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None	
Heat Source Fuel Type Heating Us	se Efficiency Percentage Of Heat Heat Elec Heat Power Ratio	trical Fuel Factor Efficiency type
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5	Ratio	
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	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.1 Showers Description Shower Type	e Flow Rate Rated Power C [l/min] [kW]	connected Connected To
28.3 Waste Water Heat Recovery System	p	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	210.00	L
Loss	1.50	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	
31.0 Thermal Store	None	
Recommendations Lower cost measures		

Further measures to achieve even higher standards

Ratings after improvement rating Environmental Impact **Typical Cost** Typical savings per year SAP rating B 84 B 89 £4,000 - £6,000 £3,500 - £5,500 £48 £206 A 97 A 98 0

SAP 10 Online 2.12.2 Page 3 of 3

Thermal Bridging



Property Reference	sc100240 P13 Bitterne	Church	Issued on Date	06/12/2023						
Assessment Reference	001		Р	rop Type Ref	Detached House					
Property	Plot 13, Bitterne Parish	Plot 13, Bitterne Parish Church, Whites Lane, Southampton, Hampshire , SO19 7NP								
SAP Rating 83 B DEF			DER	3.82	TER	10.43				
Environmental 96 A			% DER < TE	63.37						
CO ₂ Emissions (t/year)		0.39	DFEE	39.46	TFEE	40.73				
Compliance Check		See BREL	% DFEE < T	FEE		3.13				
% DPER < TPER		27.30	DPER	39.67	TPER	54.56				
Assessor Details	Mr. Mark Rogers Assessor ID A320-0001									
Client	Vivid Design Studio, Philip D	udley								

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	14.53	0.73	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	13.57	0.24	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	33.30	0.47	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	32.26	2.19	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	32.26	0.03	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	29.36	1.61	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	2.90	0.17	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	25.38	1.29	Recognised Construction Detail
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.100	4.78	-0.48	Recognised Construction Detail

Total: 188.34 W/mK: Y-Value: 0.00 W/m²K:

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc121844				Issued on Date	06/12/2023			
Assessment Reference	001			Prop Type Ref	op Type Ref New Dwelling Part L 2021				
Project	Plot 13, Bitterne Parish Cl	hurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19	7NP			
Calculation Type	New Build (As Designed)	New Build (As Designed)							
SAP Rating		85 B	DER	15.35	TER	25.05			
Environmental		86 B	% DER <ter< th=""><th></th><th>38.73</th><th></th></ter<>		38.73				
CO ₂ Emissions (t/yea	r)	1.52	DFEE	45.42	TFEE	56.60			
General Requiremen	ts Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.77</th><th></th></tfe<>	E	19.77				
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001									
Client	ivid Design Studio, Vivid Desi	gn Studio							

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

otal resistance. Opper mint = 11.445 m k/v

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121844				Issued on Date	06/12/2023		
Assessment Reference	001			Prop Type Ref	op Type Ref New Dwelling Part L 2021			
Project	Plot 13, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP		
Calculation Type	New Build (As Designed)	New Build (As Designed)						
SAP Rating		85 B	DER	15.35	TER	25.05		
Environmental		86 B	% DER <ter< th=""><th></th><th>38.73</th><th></th></ter<>		38.73			
CO ₂ Emissions (t/year)		1.52	DFEE	45.42	TFEE	56.60		
General Requirements Compliance Pass % DFEE <tfee 19.77<="" th=""><th></th></tfee>								
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						A320-0001		
Client	id Design Studio, Vivid Desi	gn Studio						

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = $4.541 \text{ m}^2 \text{ K/W}$ Lower limit = $4.510 \text{ m}^2 \text{ K/W}$ Average = $4.525 \text{ m}^2 \text{ K/W}$

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121844				Issued on Date	06/12/2023		
Assessment Reference	001			Prop Type Ref	op Type Ref New Dwelling Part L 2021			
Project	Plot 13, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP		
Calculation Type	New Build (As Designed)	New Build (As Designed)						
SAP Rating		85 B	DER	15.35	TER	25.05		
Environmental		86 B	% DER <ter< th=""><th></th><th>38.73</th><th></th></ter<>		38.73			
CO ₂ Emissions (t/year)		1.52	DFEE	45.42	TFEE	56.60		
General Requirements Compliance Pass % DFEE <tfee 19.77<="" th=""><th></th></tfee>								
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001						A320-0001		
Client	id Design Studio, Vivid Desi	gn Studio						

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description		Conductivity		
		(mm)	(W/m²K)	(m ² K/W)	(%)
Ext surface				0.0400	
.ayer 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
ayer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
ayer 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1300	

Total correction = $0.0016 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.21 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference	sc121844				Issued on Date	06/12/2023		
Assessment Reference	001			Prop Type Ref	rop Type Ref New Dwelling Part L 2021			
Project	Plot 13, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP		
Calculation Type	New Build (As Designed)	New Build (As Designed)						
SAP Rating	85 B	DER	15.35	TER	25.05			
Environmental	86 B % DER <ter 38.73<="" th=""><th></th></ter>							
CO ₂ Emissions (t/year)		1.52	DFEE	45.42	TFEE	56.60		
General Requirements	quirements Compliance Pass % DFEE <tfee 19.77<="" th=""><th></th></tfee>							
Assessor Details Mr.	ssor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001							
Client	id Design Studio, Vivid Desi	gn Studio						

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 61.05 m², Perimeter = 32.26 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fastene	rs: None or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W	Lower limit = 7.603 m ²	K/W	Average =	7.656 m² l
	Total correction = 0.0079 m ² K/W	U-value (unrounded) =	0.12 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.12 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19





SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 14, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference	sc121845				Issued on Date	06/12/2023
Assessment	001		Pr	rop Type Ref	New Dwelling Part L 202	
Reference				op Type ner	New Dwelling Fare 2 20.	
Property	Plot 14, Bitterne Parish Cl	nurch, Whites	Lane, Bitterne, Sc	outhampton,	Hampshire , SO19 7NP	
SAP Rating		85 B	DER	15.48	TER	25.26
Environmental		86 B	% DER <ter< td=""><td></td><td>38.72</td><td></td></ter<>		38.72	
CO ₂ Emissions (t/ye	ar)	1.53	DFEE	46.06	TFEE	57.33
General Requireme	nts Compliance	Pass	% DFEE <tfee< td=""><td></td><td>19.67</td><td></td></tfee<>		19.67	
Assessor Details	Mr. Mark Rogers, Surecalc Linmark@surecalc.co.uk	mited, Tel: 012	243572695,		Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Des	sign Studio				
ENE 1 - Dwelling Em	ission Rate calculation					
Total floor area				122.1	m²	
DER				15.48	kgCO₂/yr/m	2
TER				25.26	kgCO₂/yr/m	2
CO₂ emissions of	ffset from additional allowable	e electricity ge	neration	0.00	kgCO₂/yr/m	² (ZC7)
Residual CO₂ em	issions offset from biofuel CH	P		0.00	kgCO₂/yr/m	² (ZC5)
Total CO₂ emissi	ons offset from SAP Section 16	allowances		0.00	kgCO₂/yr/m	2
DER accounting	for SAP Section 16 allowances			15.48	kgCO₂/yr/m	2
Reduction DER/1	ΓER			38.72	%	
CfSH ENE1 credit	ts achieved			4.5		
CfSH ENE1 level	achieved	4				
	y Efficiency calculation					
	y Efficiency calculation			House, D	etached	
ENE 2 – Fabric Energ					etached kWh/m²/yr	
ENE 2 – Fabric Energ	iciency (F.E.E.)			House, D		
ENE 2 – Fabric Energ Dwelling type Fabric energy effi CfSH ENE2 credits	iciency (F.E.E.)			House, D 46.06		
Dwelling type Fabric energy efficiency CfSH ENE2 credits CfSH ENE1 and 2	iciency (F.E.E.) s achieved	ation		House, D 46.06 6.9		
Dwelling type Fabric energy efficiency CfSH ENE2 credits CfSH ENE1 and 2	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcul	ation		House, D 46.06 6.9		
Dwelling type Fabric energy efficiency CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcul	ation		House, D 46.06 6.9		
Dwelling type Fabric energy efficiency CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcul	ation		House, D 46.06 6.9	kWh/m²/yr	
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ er Total floor area DER	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcul	ation		House, D 46.06 6.9 4	kWh/m²/yr	
ENE 2 – Fabric Energy Dwelling type Fabric energy effit CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcul missions om electrical appliances	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54	kWh/m²/yr m² kgCO₂/yr/m²	(ZC2)
ENE 2 – Fabric Energy Dwelling type Fabric energy effit CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking	ation		House, D 46.06 6.9 4 122.1 18.85 13.97	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3)
ENE 2 – Fabric Energy Dwelling type Fabric energy effit CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro CO ₂ emissions fro	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36 34.36	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36 34.36	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effication CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions essions	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36 34.36	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effices CfSH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions DER CO ₂ emissions from CO ₂ emissions from CO ₃ emissions from CO ₄ emissions from CO ₅ emissions from CO ₆ emissions from CO ₇ emissions from CO ₇ emissions from	iciency (F.E.E.) s achieved overall level achieved to Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36 34.36 15.70 13.97	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC8)
ENE 2 – Fabric Energy Dwelling type Fabric energy effice of the ENE2 credits of the ENE2 credits of the ENE2 credits of the ENE3 and 2 ENE 7 – Low and Zeres of the ENE3 of the ENE4 of the ENE5 of the ENES of	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking cooking	ation		House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36 34.36 15.70 13.97 1.54	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC8) (ZC2) (ZC2) (ZC3) (ZC4)
ENE 2 – Fabric Energy Dwelling type Fabric energy effice of SH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions from CO ₂ em	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking cooking		n	House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36 34.36 15.70 13.97 1.54 31.21	kWh/m²/yr m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC3) (ZC4) (ZC5)
ENE 2 – Fabric Energy Dwelling type Fabric energy effice of SH ENE2 credits CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions from Standard case total Net Standard case Actual case CO ₂ emissions from CO ₂ em	iciency (F.E.E.) s achieved overall level achieved o Carbon Technologies calcul missions om electrical appliances om cooking tal CO ₂ emissions e CO ₂ emissions ssions om electrical appliances om cooking CO ₂ emissions om additional allowable electrical		n	House, D 46.06 6.9 4 122.1 18.85 13.97 1.54 34.36 34.36 15.70 13.97 1.54 31.21 0.00	m² kgCO₂/yr/m²	(ZC2) (ZC3) (ZC4) (ZC8) (ZC2) (ZC3) (ZC4) (ZC5) (ZC7)



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

\sim			



Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:31:34

Project Information					
Assessed By	Mark Rogers	Building Type	House, Detached		
OCDEA Registration	EES/004179	Assessment Date	2023-12-06		

Dwelling Details				
Assessment Type	As designed	Total Floor Area	122 m ²	
Site Reference	sc100241 P14 Bitterne	Plot Reference	001	
	Church			
Address	Bitterne Parish Church Plot 14 Whites Lane, Southampton, SO19 7NP			

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

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

1a Target emission rate and dwelling emission	rate	
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	10.56 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	3.87 kgCO ₂ /m ²	OK
1b Target primary energy rate and dwelling prin	mary energy	
Target primary energy	55.28 kWh _{PE} /m ²	
Dwelling primary energy	40.12 kWh _{PE} /m ²	OK
1c Target fabric energy efficiency and dwelling	fabric energy efficiency	
Target fabric energy efficiency	41.3 kWh/m ²	·
Dwelling fabric energy efficiency	40.1 kWh/m ²	OK

2a Fabric U-values										
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value							
External walls	0.26	0.22	Walls (1) (0.22)	OK						
Party walls	0.2	N/A	N/A	N/A						
Curtain walls	1.6	N/A	N/A	N/A						
Floors	0.18	0.12	Ground Floor (0.12)	OK						
Roofs	0.16	0.09	Roof (1) (0.09)	OK						
Windows, doors,	1.6	1.2	Front West Door (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)	137.21	0.22						
Exposed wall: Walls (2)	8.59	0.21						
Ground floor: Ground Floor, Ground Floor	61.05	0.12						
Exposed roof: Roof (1)	61.05	0.09 (!)						

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]					
Front West Door, New Dwell Entrance	2.01	East	N/A	1.2					
Door									
Front West Windows, New Dwelling DG	4.41	East	0.7	1.2					
Window									
Front West Window, New Dwelling DG	1.9	East	0.7	1.2					
Window									
Side South Windows, New Dwelling DG	1.8	South	0.7	1.2					
Window									
Rear East Windows, New Dwelling DG	4.92	West	0.7	1.2					
Window									
Rear West Windows, New Dwell DG	3.35	West	0.7	1.2					
French Doors									

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
Side South Door, New Dwell Entrance	1.95	South	N/A	1.2
Door				

2d Thermal brid	2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))									
Building part 1 -	Main Dwelling: Thermal bridging ca	alculated from linear thermal transmit	tances for each ju	unction						
Main element	Junction detail	Source	Psi value	Drawing /						
			[W/mK]	reference						
External wall	E2: Other lintels (including other	Calculated by person with suitable	0.05	IG or Keystone						
	steel lintels)	expertise		Hi Therm +						
External wall	E3: Sill	Calculated by person with suitable	0.018 (!)	Recognised						
		expertise		Construction						
				Detail						
External wall	E4: Jamb	Calculated by person with suitable	0.014 (!)	Recognised						
		expertise		Construction						
				Detail						
External wall	E5: Ground floor (normal)	Calculated by person with suitable	0.068	Recognised						
		expertise		Construction						
				Detail						
External wall	E6: Intermediate floor within a	Calculated by person with suitable	0.001 (!)	Recognised						
	dwelling	expertise		Construction						
				Detail						
External wall	E10: Eaves (insulation at ceiling	Calculated by person with suitable	0.055	Recognised						
	level)	expertise		Construction						
				Detail						
External wall	E12: Gable (insulation at ceiling	Calculated by person with suitable	0.058	Recognised						
	level)	expertise		Construction						
				Detail						
External wall	E16: Corner (normal)	Calculated by person with suitable	0.051	Recognised						
		expertise		Construction						
				Detail						
External wall	E17: Corner (inverted - internal	Calculated by person with suitable	-0.1	Recognised						
	area greater than external area)	expertise		Construction						
				Detail						

3 Air permeability (better than typically expected values are flagged with a subsequent (!))							
Maximum permitted air permeability at 50Pa	8 m ³ /hm ²						
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	ОК					
Air permeability test certificate reference							

4 Space heating							
Main heating system 1: Heat pump with	Main heating system 1: Heat pump with radiators or underfloor heating - Electricity						
Efficiency	ciency 242.1%						
Emitter type	Radiators						
Flow temperature	55°C						
System type	Heat Pump						
Manufacturer	Daikin Europe NV						
Model	EDLA06EV3						
Commissioning							
Secondary heating system: N/A							
Fuel	N/A						
Efficiency	N/A						
Commissioning							

5 Hot water							
Cylinder/store - type: Cylinder							
Capacity	210 litres						
Declared heat loss	1.5 kWh/day						
Primary pipework insulated	Yes						
Manufacturer							
Model							
Commissioning							
Waste water heat recovery system 1 -	type: N/A						
Efficiency							
Manufacturer							
Model							

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model T Lighting Minimum permitted light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System type: N/A Maximum permitted specific fan power N/A Maximum permitted specific fan power N/A Minimum permitted sheat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report. Signed: Assessor ID:				
Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Maximum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	6 Controls			
Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W OK External lights control N/A 8 Mechanical ventilation System type: N/A N/A Maximum permitted specific fan power N/A N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical s	ervices
Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Minimum permitted specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Function			
Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 Im/W Lowest light source efficacy 75 Im/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Ecodesign class			
Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7. Lighting Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W System type: N/A N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9. Local generation N/A 10. Heat networks N/A 11. Supporting documentary evidence N/A 12. Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Manufacturer			
Manufacturer Model A	Model			
Manufacturer Model A	Water heating - type: Cylinder thermosta	at and HW separately	timed	
Model 7 Lighting Minimum permitted light source efficacy 75 lm/W		, , , , , , , , , , , , , , , , , , ,		
Minimum permitted light source efficacy 75 Im/W OK External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Minimum permitted light source efficacy 75 Im/W OK External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Lowest light source efficacy 75 Im/W N/A 8 Mechanical ventilation N/A 8 Mechanical ventilation N/A System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		·		
External lights control 8 Mechanical ventilation System type: IVA Maximum permitted specific fan power				
8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Lowest light source efficacy	75 lm/W		OK
System type: N/A Maximum permitted specific fan power Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	External lights control	N/A		
System type: N/A Maximum permitted specific fan power Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	8 Mechanical ventilation			
Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
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### Heat recovery efficiency ### N/A ### N				IN/A
Heat recovery efficiency N/A N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		IN/A		
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9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	-	N/A		N/A
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N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	9 Local generation			
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the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	This declaration by the assessor is co	nfirmation that the co	ntents of this BREL Compliance Report	
evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	are a true and accurate reflection bas	ed upon the design ir	nformation submitted for this dwelling for	
evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	the purpose of carrying out the "As de	signed" assessment,	and that the supporting documentary	
documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Compliance Report.	1	,	· · · · · · · · · · · · · · · · · · ·	
	. ,		area ar proporning and arrang	
Signed: Assessor ID:				1
Signed: Assessor ID:				
Added to 1.	Signed:		Assessor ID:	
	Oigrica.		/10000001 ID.	
Nomo:	Namo		Data:	
Name: Date:	INAILIE.		Date.	
h Client Declaration	h Client Declaration			

N/A

Predicted Energy Assessment



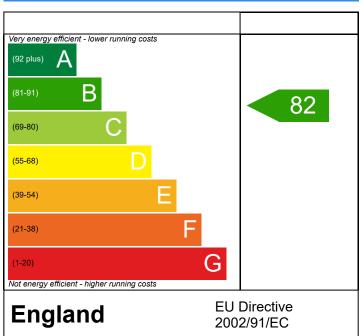
Plot 14, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 122.1 m²
DRRN: 1866-2492-0874

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.

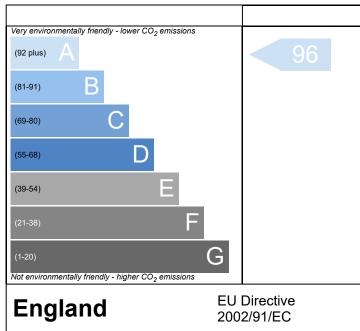
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc100	241 P14 Bitterne C	hurch					Issue	ssued on Date 06/12/2			3
Assessment Reference	001				Pro	р Туре	Ref	New D	welling			
Property	Plot 14	1, Bitterne Parish C	Church, Whites Lane, S	outham	oton, Ha	mpshire	, SO19 7I	NP				
SAP Rating			82 B	DER		3.8	7		TER		10.56	
Environmental			96 A	% DEF	R < TER						63.35	
CO ₂ Emissions (t/year)			0.39	DFEE		40.0	08		TFEE		41.35	
Compliance Check			See BREL	% DFE	E < TFE	E					3.07	
% DPER < TPER			27.42	DPER		40.	12		TPER		55.28	
Assessor Details	Mr. Mark R	ogers							Assess	or ID	A320-0	001
Client		n Studio, Philip Du	ıdley								100000	
SUMMARY FOR INPL		•										
Orientation		`	East									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Detached									
2.0 Number of Storeys			2									
3.0 Date Built			2023									
4.0 Sheltered Sides			1									
5.0 Sunlight/Shade			Average or unknown									
6.0 Thermal Mass Parame	eter		Precise calculation									
7.0 Electricity Tariff			Standard									
Smart electricity meter	fitted		No									
Smart gas meter fitted	inticu		No									
7.0 Measurements												
7.0 Measurements			Ground floo		t Loss F 32.26		er In	ternal FI 61.05		a A	erage Sto	
			1st Store		32.26			61.05			2.76	
8.0 Living Area			15.46						m²			
9.0 External Walls												
Description	Туре	Construction			Kappa (kJ/m²K		Nett Area) (m²)	Res	Shelt	er C	penings Are	Type
External Cavity Wall	Cavity Wall	lightweight aggregate	ard on dabs or battens, block, filled cavity, any	0.22	110.00	155.65	137.21	0.00	None	9	18.44 Calc	ulate Wall Ar
External Tile Hung Wall	Cavity Wall		ard on dabs or battens, block, filled cavity, any	0.21	110.00	10.49	8.59	0.00	None	e	1.90 Ent	er Gross Area
9.1 Party Walls												
Description	Type	Construc	tion				U-Value (W/m ² K)	Kappa (kJ/m²K		She Re		helter
Party Wall	Filled Cavi Edge Seal		sterboard on dabs bot blocks, cavity or cavit		ightweig	jht	0.00	110.00				None
9.2 Internal Walls												
Description		Constructi	ion								Kappa (kJ/m²K)	Area (m
Internal Stud Walls Internal Block Walls			rd on timber frame k, plasterboard on dab	s							9.00 75.00	180.27 68.12
10.0 External Roofs	_						_					_
Description	Туре	Construction			l-Value N/m²K)(Gross Area(m²)			Shelter Factor	Calculation Type	nOpening
External Pitched Roofs	External Plar Roof	ne Plasterboard,	insulated at ceiling lev	-	0.09	9.00	61.05	(m²) 61.05	None	0.00	Calculate Wall Area	
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceiling									e a (m²) 31.05

SAP 10 Online 2.12.2 Page 1 of 3



11.0 Heat Loss Floors											
Description	Туре	Storey Index	С	onstruction		U-Valu (W/m²ł		Shelter Code		elter Kap ctor (kJ/n	pa Area (m²) ¹²K)
Ground Floor	Ground Floor - Solid	Lowest occupi	ied S	suspended concrete floor,	carpeted	0.12		None	0	.00 75.0	00 61.05
11.2 Internal Floors Description		Storey Index	Constr	ruction						Kappa (kJ/m²K	
Internal Floor			Plaster	board ceiling, carpe	ted chipboard floo	or				9.00	61.05
12.0 Opening Types											
Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Doo New Dwell DG French Doors	or Manufacturer Manufacturer	Half Glaze Window	d Door	Double Low-E S Double Low-E S		·	•	0.36 0.71	,,	0.70 0.70	1.20 1.20
New Dwelling DG Windo	w Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
Name Front West Door Front West Windows Front West Window Side South Windows Rear East Windows Rear West Windows Side South Door	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin New Dwell E New Dwell E	Entrance Doc g DG Windo g DG Windo g DG Windo g DG Windo DG French D	or Ex w Ex w Ex w Ex ow Ex oors Ex	ocation xternal Cavity Wall xternal Cavity Wall xternal Tile Hung Wa xternal Cavity Wall	all	Orienta East East East Soutl Wes Wes Soutl	t t t	Area (2.0' 4.4' 1.90 1.80 4.92 3.35 1.95	1 1 0 0 2 5	Р	itch
14.0 Conservatory			No	one							
15.0 Draught Proofing			10	00				%			
16.0 Draught Lobby			No	o				Ħ			
								<u> </u>			
17.0 Thermal Bridging 17.1 List of Bridges			Ca	alculate Bridges							
E2 Other lintels (includin E3 Sill E4 Jamb E5 Ground floor (normal E6 Intermediate floor wit E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E17 Corner (inverted – in external area)) hin a dwelling ceiling level) ceiling level)	,	Indepe Indepe Indepe Indepe Indepe Indepe Indepe	ndently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed indently assessed	14.53 13.57 33.30 32.26 32.26 29.36 2.90 25.38 4.78	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	IG or Keysto Recognised Recognised Recognised Recognised Recognised Recognised Recognised	Construct Construct Construct Construct Construct Construct Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	I No I No I No I No I No
Y-value			0.0	00				W/m²K			
18.0 Pressure Testing			Ye	es							
Designed AP ₅₀			5.0	05				m³/(h.m²	²) @ 50 P	а	
Test Method			Bl	ower Door							
19.0 Mechanical Ventilation	n										
Mechanical Ventilation								\neg			
Mechanical Ventila	-	ent	No	0							
20.0 Fans, Open Fireplace	s, Flues										
21.0 Fixed Cooling System	1		No	0							
22.0 Lighting								_			
No Fixed Lighting			No	Name	Efficacy	Pow		Como	altu	_	t
			Low e	nergy Lighting	Efficacy 75.00	15		Capa 112		C	ount 36
24.0 Main Heating 1			Da	atabase							
Description			El	ectric Air Source He	at Pump						
Percentage of Heat			10	00.00				%			
Database Ref. No.			10	06473							
Fuel Type			El	ectricity							
In Winter			0.0	00							
In Summer			0.0	00							
Model Name			E	DLA06EV3				$\bar{\Box}$			

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Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space Independent Time Control Insulation Type Cylinder Volume Loss Pipes insulation In Airing Cupboard 31.0 Thermal Store	From mains 1 No Flow Rate Rated Power (I/min) [kW] Hot Water Cylinder Yes Yes Yes Measured Loss 210.00 1.50 Fully insulated primary pipework No None	Connected Connected To L kWh/day
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space Independent Time Control Insulation Type Cylinder Volume Loss Pipes insulation	From mains 1 No Flow Rate Rated Power (I/min] [kW] Hot Water Cylinder Yes Yes Yes Measured Loss 210.00 1.50 Fully insulated primary pipework	
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space Independent Time Control Insulation Type Cylinder Volume Loss	From mains 1 No Flow Rate Rated Power (I/min] [kW] Hot Water Cylinder Yes Yes Yes Measured Loss 210.00 1.50	
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space Independent Time Control Insulation Type Cylinder Volume	From mains 1 No Flow Rate Rated Power (I/min] [kW] Hot Water Cylinder Yes Yes Yes Measured Loss 210.00	
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space Independent Time Control Insulation Type	From mains 1 No Flow Rate Rated Power (I/min] [kW] Hot Water Cylinder Yes Yes Yes Measured Loss	
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space Independent Time Control	From mains 1 No Flow Rate Rated Power (I/min] [kW] Hot Water Cylinder Yes Yes Yes	Connected Connected To
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space	From mains 1 No Flow Rate Rated Power (I/min] [kW] Hot Water Cylinder Yes Yes	Connected Connected To
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder Cylinder Stat	From mains 1 No Flow Rate Rated Power (I/min] [kW] Hot Water Cylinder Yes	Connected To
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System 29.0 Hot Water Cylinder	From mains 1 No Flow Rate Rated Power (I/min] [kW]	Connected Connected To
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ 28.3 Waste Water Heat Recovery System	From mains 1 No Flow Rate Rated Power (I/min] [kW]	Connected Connected To
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers Description Shower Typ	From mains 1 No Flow Rate Rated Power Company Compa	Connected Connected To
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water 28.1 Showers	From mains 1 No Flow Rate Rated Power Company Compa	Connected Connected To
Water use <= 125 litres/person/day Cold Water Source Bath Count Immersion Only Heating Hot Water	From mains 1	
Water use <= 125 litres/person/day Cold Water Source Bath Count	From mains 1	
Water use <= 125 litres/person/day Cold Water Source	From mains	
Water use <= 125 litres/person/day		
	V	
Solar Panel	No	
Waste Water Heat Recovery Storage System	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Flue Gas Heat Recovery System	No]
SAP Code	901	
Water Heating	Main Heating 1	
Heat source 1 Heat source 2 Heat source 3 Heat source 4 Heat source 5 28.0 Water Heating		
Heat Source Fuel Type Heating U	se Efficiency Percentage Of Heat Heat Ele Heat Power Ratio	ctrical Fuel Factor Efficiency type
26.0 Heat Networks	None	
25.0 Main Heating 2	None	
Flow Temperature Value	55.00	
Flow Temperature	Enter value	
Heat Emitter	Radiators	
Heating Pump Age	2013 or later	
Is MHS Pumped	Pump in heated space	
PCDF Controls	0	
Controls SAP Code	2207	
System Type	Heat Pump	
Manufacturer	Daikin Europe NV	

None

Further measures to achieve even higher standards

 Typical Cost
 Typical savings per year
 Ratings after improvement SAP rating
 Environmental Impact

 £4,000 - £6,000
 £48
 B 83
 A 96

 £3,500 - £5,500
 £206
 B 89
 A 97

 0
 0

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Thermal Bridging



Property Reference	sc100241 P14 Bitterne	Church		Is	ssued on Date	06/12/2023
Assessment Reference	001		Prop	Type Ref De	tached House	
Property	Plot 14, Bitterne Parish	Church, Whites Lane	, Southampton, Han	npshire , SO19 7NP	1	
SAP Rating		82 B	DER	3.87	TER	10.56
Environmental		96 A	% DER < TER			63.35
CO ₂ Emissions (t/year)		0.39	DFEE	40.08	TFEE	41.35
Compliance Check		See BREL	% DFEE < TFEE			3.07
% DPER < TPER		27.42	DPER	40.12	TPER	55.28
Assessor Details	Mr. Mark Rogers				Assessor ID	A320-0001
Client	Vivid Design Studio, Philip D	udley				

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	14.53	0.73	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	13.57	0.24	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	33.30	0.47	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	32.26	2.19	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	32.26	0.03	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	29.36	1.61	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	2.90	0.17	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	25.38	1.29	Recognised Construction Detail
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.100	4.78	-0.48	Recognised Construction Detail

Total: 188.34 W/mK: Y-Value: 0.00 W/m²K:

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Property Reference	sc121845				ssued on Date	06/12/2023
Assessment Reference	001		Pr	op Type Ref	Iew Dwelling Part L	2021
Project	Plot 14, Bitterne Parish Cl	nurch, Whites	Lane, Bitterne, So	uthampton, Ha	mpshire , SO19 7	'NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.48	TER	25.26
Environmental		86 B	% DER <ter< th=""><th></th><th>38.72</th><th></th></ter<>		38.72	
CO ₂ Emissions (t/ye	ar)	1.53	DFEE	46.06	TFEE	57.33
General Requireme	nts Compliance	Pass	% DFEE <tfee< th=""><th></th><th>19.67</th><th></th></tfee<>		19.67	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	ited, Tel: 0124	13572695, mark@	surecalc.co.uk	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Lavor	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m^2K/W)	(%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total resistance: Upper limit = 11.449 m² K/W Lower limit = 11.248 m² K/W Average = 11.348 m² K/W

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121845				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 14, Bitterne Parish Cl	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.48	TER	25.26
Environmental		86 B	% DER <ter< th=""><th></th><th>38.72</th><th></th></ter<>		38.72	
CO ₂ Emissions (t/year)		1.53	DFEE	46.06	TFEE	57.33
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.67</th><th></th></tfe<>	E	19.67	
Assessor Details Mr.	Mark Rogers, Surecalc Lim	ited, Tel: 0124	3572695, ma	rk@surecalc.co.u	k Assessor ID	A320-0001
Client	d Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		. ,	(, ,	0.0400	(- /
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
	per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	
				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121845				Issued on Date	06/12/2023
Assessment Reference	e 001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 14, Bitterne Parish C	hurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.48	TER	25.26
Environmental		86 B	% DER <ter< th=""><th></th><th>38.72</th><th></th></ter<>		38.72	
CO ₂ Emissions (t/ye	ear)	1.53	DFEE	46.06	TFEE	57.33
General Requireme	nts Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.67</th><th></th></tfe<>	E	19.67	
Assessor Details	Mr. Mark Rogers, Surecalc Lim	ited, Tel: 0124	3572695, ma	rk@surecalc.co.u	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Desi	gn Studio				

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Tile Hanging				
	Main construction	15	1.0000	0.0150	100.00
Layer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
ayer 3	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
_	per m ² : 2.500				
yer 5	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
_	Normal				
yer 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
t surface				0.1300	

Total correction = $0.0016 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.21 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a





Property Reference	sc121845				Issued on Date	06/12/2023
Assessment Reference	001			Prop Type Ref	New Dwelling Part L	2021
Project	Plot 14, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	'NP
Calculation Type	New Build (As Designed)					
SAP Rating		85 B	DER	15.48	TER	25.26
Environmental		86 B	% DER <ter< th=""><th></th><th>38.72</th><th></th></ter<>		38.72	
CO ₂ Emissions (t/year)		1.53	DFEE	46.06	TFEE	57.33
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>Ε</th><th>19.67</th><th></th></tfe<>	Ε	19.67	
Assessor Details Mr.	Mark Rogers, Surecalc Lim	ited, Tel: 0124	3572695, ma	rk@surecalc.co.u	k Assessor ID	A320-0001
Client	id Design Studio, Vivid Desi	gn Studio				

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 61.05 m², Perimeter = 32.26 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		, ,		0.1700	, ,
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or				
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total correction = 0.0079 m² K/W U-value (unrounded) = 0.12 W/m² K

Unheated space: None

Total thickness: 325 mm U-value: 0.12 W/m² K Kappa: n/a







SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Plot 15, Bitterne Parish Church, Whites Lane

Bitterne, Southampton, Hampshire, SO19 7NP

Contact: Mark Rogers

Surecalc Limited

mark@surecalc.co.uk

Report Issue Date: 06/12/2023

EXCELLENCE IN ENERGY ASSESSMENT

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



Property Reference						6/12/2023
Assessment Reference	001		Pi	rop Type Ref	New Dwelling Part L 202	1
Property	Plot 15, Bitterne Parish	Church Whites	Lane Bitterne Sc	outhampton	Hamnshire SO19 7NP	
	Flot 19, Bitterne i drish					
SAP Rating		84 B	DER	15.68	TER	25.60
Environmental		86 B	% DER <ter< td=""><td></td><td>38.75</td><td></td></ter<>		38.75	
CO ₂ Emissions (t/ye	·	1.55	DFEE	47.11	TFEE	58.45
General Requireme	ents Compliance	Pass	% DFEE <tfee< td=""><td></td><td>19.40</td><td></td></tfee<>		19.40	
Assessor Details	Mr. Mark Rogers, Surecalc mark@surecalc.co.uk	Limited, Tel: 012	43572695,		Assessor ID A	320-0001
Client	Vivid Design Studio, Vivid [Design Studio				
ENE 1 - Dwelling Em	ission Rate calculation					
Total floor area				122.1	m²	
DER				15.68	kgCO ₂ /yr/m ²	!
TER				25.60	kgCO ₂ /yr/m ²	
CO ₂ emissions o	ffset from additional allowa	ble electricity ger	neration	0.00	kgCO ₂ /yr/m ²	
	nissions offset from biofuel (0.00	kgCO ₂ /yr/m ²	
Total CO₂ emissi	ons offset from SAP Section	16 allowances		0.00	kgCO ₂ /yr/m ²	
DER accounting	for SAP Section 16 allowanc	es		15.68	kgCO ₂ /yr/m ²	
Reduction DER/	TER			38.75	%	
CfSH ENE1 credi	ts achieved			4.5		
CfSH ENE1 level	achieved			4		
				4		
ENE 2 – Fabric Energ	gy Efficiency calculation			4		
ENE 2 – Fabric Energ				House, D	etached	
_	y Efficiency calculation				etached kWh/m²/yr	
Dwelling type	y Efficiency calculation			House, D		
Dwelling type Fabric energy eff CfSH ENE2 credit	y Efficiency calculation			House, D 47.11		
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2	gy Efficiency calculation iciency (F.E.E.) s achieved	culation		House, D 47.11 6.6		
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2	gy Efficiency calculation iciency (F.E.E.) s achieved overall level achieved co Carbon Technologies calc	culation		House, D 47.11 6.6		
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer	gy Efficiency calculation iciency (F.E.E.) s achieved overall level achieved co Carbon Technologies calc	culation		House, D 47.11 6.6		
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e	gy Efficiency calculation iciency (F.E.E.) s achieved overall level achieved co Carbon Technologies calc	culation		House, D 47.11 6.6 4	kWh/m²/yr	
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER	gy Efficiency calculation iciency (F.E.E.) s achieved overall level achieved co Carbon Technologies calc	culation		House, D 47.11 6.6 4	kWh/m²/yr	(ZC2)
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER	iciency (F.E.E.) s achieved overall level achieved ro Carbon Technologies calc emissions	culation		House, D 47.11 6.6 4 122.1 19.14 13.97 1.54	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC2) (ZC3)
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro	iciency (F.E.E.) s achieved overall level achieved ro Carbon Technologies calc emissions	culation		House, D 47.11 6.6 4 122.1 19.14 13.97	m² kgCO ₂ /yr/m² kgCO ₂ /yr/m²	. ,
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro	iciency (F.E.E.) s achieved overall level achieved ro Carbon Technologies calc emissions om electrical appliances om cooking tal CO ₂ emissions	culation		House, D 47.11 6.6 4 122.1 19.14 13.97 1.54	kWh/m²/yr	(ZC3)
Dwelling type Fabric energy eff CfSH ENE2 credit CfSH ENE1 and 2 ENE 7 – Low and Zer Standard case CO ₂ e Total floor area DER CO ₂ emissions fro CO ₂ emissions fro Standard case to	iciency (F.E.E.) s achieved overall level achieved ro Carbon Technologies calc emissions om electrical appliances om cooking tal CO ₂ emissions se CO ₂ emissions	culation		House, D 47.11 6.6 4 122.1 19.14 13.97 1.54 34.65	kWh/m²/yr m² kgCO ₂ /yr/m²	(ZC3) (ZC4)
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Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

CODE FOR SUSTAINABLE HOMES Calculation Type: New Build (As Designed)



ENE7 credits achieved

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Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 06 Dec 2023 15:32:15

Project Information			
Assessed By	Mark Rogers	Building Type	House, Detached
OCDEA Registration	EES/004179	Assessment Date	2023-12-06

Dwelling Details			
Assessment Type	As designed	Total Floor Area	122 m ²
Site Reference	sc100242 P15 Bitterne	Plot Reference	001
	Church		
Address	Bitterne Parish Church Plot 15 Whites Lane, Southampton, SO19 7NP		

Client Details		
Name	Philip Dudley	
Company	Vivid Design Studio	
Address	NA, NA, NA	

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	Electricity		
Target carbon dioxide emission rate	10.86 kgCO ₂ /m ²			
Dwelling carbon dioxide emission rate	3.82 kgCO ₂ /m ²	OK		
1b Target primary energy rate and dwelling primary energy				
Target primary energy	56.87 kWh _{PE} /m ²			
Dwelling primary energy	39.61 kWh _{PE} /m ²	OK		
1c Target fabric energy efficiency and dwelling fabric energy efficiency				
Target fabric energy efficiency	42.2 kWh/m ²			
Dwelling fabric energy efficiency	41.0 kWh/m ²	OK		

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m²K]	Dwelling average U-Value [W/m²K]	Element with highest individual U-Value	
External walls	0.26	0.22	Walls (1) (0.22)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.12	Ground Floor (0.12)	OK
Roofs	0.16	0.09	Roof (1) (0.09)	OK
Windows, doors,	1.6	1.2	Front West Door (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)	137.21	0.22
Exposed wall: Walls (2)	8.59	0.21
Ground floor: Ground Floor, Ground Floor	61.05	0.12
Exposed roof: Roof (1)	61.05	0.09 (!)

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]
Front West Door, New Dwell Entrance	2.01	East	N/A	1.2
Door				
Front West Windows, New Dwelling DG	4.41	East	0.7	1.2
Window				
Front West Window, New Dwelling DG	1.9	East	0.7	1.2
Window				
Side North Windows, New Dwelling DG	1.8	North	0.7	1.2
Window				
Rear East Windows, New Dwelling DG	4.92	West	0.7	1.2
Window				
Rear West Windows, New Dwell DG	3.35	West	0.7	1.2
French Doors				

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
Side North Door, New Dwell Entrance	1.95	North	N/A	1.2
Door				

2d Thermal brid	2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 -	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	E2: Other lintels (including other	Calculated by person with suitable	0.05	IG or Keystone	
	steel lintels)	expertise		Hi Therm +	
External wall	E3: Sill	Calculated by person with suitable	0.018 (!)	Recognised	
		expertise		Construction	
				Detail	
External wall	E4: Jamb	Calculated by person with suitable	0.014 (!)	Recognised	
		expertise		Construction	
				Detail	
External wall	E5: Ground floor (normal)	Calculated by person with suitable	0.068	Recognised	
		expertise		Construction	
				Detail	
External wall	E6: Intermediate floor within a	Calculated by person with suitable	0.001 (!)	Recognised	
	dwelling	expertise		Construction	
				Detail	
External wall	E10: Eaves (insulation at ceiling	Calculated by person with suitable	0.055	Recognised	
	level)	expertise		Construction	
				Detail	
External wall	E12: Gable (insulation at ceiling	Calculated by person with suitable	0.058	Recognised	
	level)	expertise		Construction	
				Detail	
External wall	E16: Corner (normal)	Calculated by person with suitable	0.051	Recognised	
		expertise		Construction	
				Detail	
External wall	E17: Corner (inverted - internal	Calculated by person with suitable	-0.1	Recognised	
	area greater than external area)	expertise		Construction	
				Detail	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))			
Maximum permitted air permeability at 50Pa	8 m³/hm²		
Dwelling air permeability at 50Pa	5.05 m ³ /hm ² , Design value	OK	
Air permeability test certificate reference			

4 Space heating			
Main heating system 1: Heat pump with	Main heating system 1: Heat pump with radiators or underfloor heating - Electricity		
Efficiency	242.1%		
Emitter type	Radiators		
Flow temperature	55°C		
System type	Heat Pump		
Manufacturer	Daikin Europe NV		
Model	EDLA06EV3		
Commissioning			
Secondary heating system: N/A			
Fuel	N/A		
Efficiency	N/A		
Commissioning			

5 Hot water						
Cylinder/store - type: Cylinder						
Capacity	210 litres					
Declared heat loss	1.5 kWh/day					
Primary pipework insulated	Yes					
Manufacturer						
Model						
Commissioning						
Waste water heat recovery syster	1 1 - type: N/A					
Efficiency						
Manufacturer						
Model						

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model T Lighting Minimum permitted light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW Lowest light source efficacy 75 ImW System type: N/A Maximum permitted specific fan power N/A Maximum permitted specific fan power N/A Minimum permitted sheat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report. Signed: Assessor ID:				
Function Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Maximum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	6 Controls			
Ecodesign class Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 lm/W OK External lights control N/A 8 Mechanical ventilation System type: N/A N/A Maximum permitted specific fan power N/A N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Main heating 1 - type: Time and tempera	ature zone control by	arrangement of plumbing and electrical s	ervices
Manufacturer Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model Minimum permitted light source efficacy 75 lm/W Lowest light source efficacy 75 lm/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Minimum permitted specific fan power N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Minimum permitted heat recovery N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Function			
Model Water heating - type: Cylinder thermostat and HW separately timed Manufacturer Model 7 Lighting Minimum permitted light source efficacy 75 Im/W Lowest light source efficacy 75 Im/W External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery efficiency N/A Minimum permitted heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	Ecodesign class			
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Manufacturer Model A	Model			
Manufacturer Model A	Water heating - type: Cylinder thermosta	at and HW separately	timed	
Model 7 Lighting Minimum permitted light source efficacy 75 lm/W		, , , , , , , , , , , , , , , , , , ,		
Minimum permitted light source efficacy 75 Im/W OK External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Minimum permitted light source efficacy 75 Im/W OK External lights control N/A 8 Mechanical ventilation System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A Minimum permitted heat recovery N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Lowest light source efficacy 75 Im/W N/A 8 Mechanical ventilation N/A 8 Mechanical ventilation N/A System type: N/A Maximum permitted specific fan power N/A Specific fan power N/A N/A Minimum permitted heat recovery efficiency N/A Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		·		
External lights control 8 Mechanical ventilation System type: IVA Maximum permitted specific fan power				
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System type: N/A Maximum permitted specific fan power Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	External lights control	N/A		
System type: N/A Maximum permitted specific fan power Specific fan power N/A Minimum permitted heat recovery efficiency Heat recovery efficiency N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	8 Mechanical ventilation			
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### Heat recovery efficiency ### N/A ### N				IN/A
Heat recovery efficiency N/A N/A Manufacturer/Model Commissioning 9 Local generation N/A 10 Heat networks N/A 11 Supporting documentary evidence N/A 12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		IN/A		
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12 Declarations a. Assessor Declaration This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
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are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	a. Assessor Declaration			
the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	This declaration by the assessor is co	nfirmation that the co	ntents of this BREL Compliance Report	
evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	are a true and accurate reflection bas	ed upon the design ir	nformation submitted for this dwelling for	
evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	the purpose of carrying out the "As de	signed" assessment,	and that the supporting documentary	
documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.				
Compliance Report.	1	,	· · · · · · · · · · · · · · · · · · ·	
	. ,		area ar proporning and arrang	
Signed: Assessor ID:				1
Signed: Assessor ID:				
Added to 1.	Signed:		Assessor ID:	
	Oigrica.		/10000001 ID.	
Nomo:	Namo		Data:	
Name: Date:	INAILIE.		Date.	
h Client Declaration	h Client Declaration			

N/A

Predicted Energy Assessment



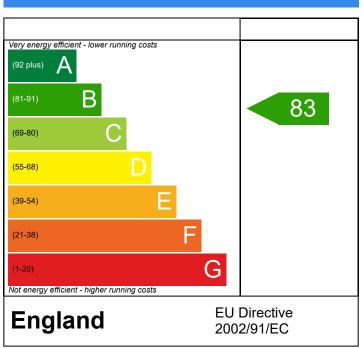
Plot 15, Bitterne Parish Church, Whites Lane, Southampton, Hampshire, SO19 7NP

Dwelling type: House, Detached
Date of assessment: 06/12/2023
Produced by: Mark Rogers
Total floor area: 122.1 m²
DRRN: 7056-2992-0270

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.

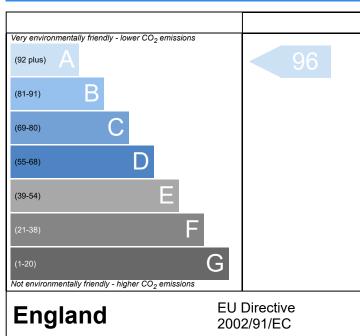
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO₂) Rating



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

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference		242 P15 Bitterne C	Church					Issue	ed on Da	te	06/12/202	3
Assessment Reference	001	001 Prop Type Ref New						New D	welling			
Property	Plot 15	, Bitterne Parish C	Church, Whites Lane, S	outhamp	ton, Ha	mpshire	, SO19 7I	NP				
SAP Rating			83 B	DER		3.82	2		TER		10.86	
Environmental			96 A	% DEF	< TER						64.83	
CO ₂ Emissions (t/year)			0.38	DFEE		41.0)4		TFEE		42.23	
Compliance Check			See BREL	% DFE	E < TFE	E					2.82	
% DPER < TPER			30.36	DPER		39.6	61		TPER		56.87	
Assessor Details	Mr. Mark Ro	ogers							Assess	or ID	A320-0	1001
Client		n Studio, Philip Du	ıdley									
SUMMARY FOR INPL	JT DATA FOR	: New Build (A	As Designed)									
Orientation			East									
Property Tenture			ND									
Transaction Type			6									
Terrain Type			Suburban									
1.0 Property Type			House, Detached									
2.0 Number of Storeys			2									
3.0 Date Built			2023									
4.0 Sheltered Sides			1									
5.0 Sunlight/Shade			Average or unknown									
6.0 Thermal Mass Parame	eter		Precise calculation									
7.0 Electricity Tariff			Standard									
Smart electricity meter	fitted		No									
Smart gas meter fitted			No									
7.0 Measurements												
			Ground floo		Loss F 32.26	erimete m	r In	ternal FI 61.05	oor Area 5 m²	ı Av	erage Sto 2.39	
			1st Store	/ :	32.26	m		61.05	5 m²		2.76	m
8.0 Living Area			15.46						m²			
9.0 External Walls												
Description	Туре	Construction		(W/m ² K)		Area(m²		Res	Shelte		penings Are	Type
External Cavity Wall	Cavity Wall		pard on dabs or battens, e block, filled cavity, any	0.22	110.00	155.65	137.21	0.00	None	9	18.44 Calc	ulate Wall Ar
External Tile Hung Wall	Cavity Wall	Cavity wall; plasterbo	pard on dabs or battens, e block, filled cavity, any	0.21	110.00	10.49	8.59	0.00	None	•	1.90 Ent	er Gross Area
9.1 Party Walls												
Description	Туре	Construc	ction					Kappa (kJ/m²k		Shel Re		Shelter
Party Wall	Filled Cavit Edge Seali		asterboard on dabs bot e blocks, cavity or cavit		ightweig	ht	0.00	110.00		3		None
9.2 Internal Walls	-		<u> </u>									
Description		Constructi	ion								Kappa (kJ/m²K)	Area (m²
Internal Stud Walls Internal Block Walls			rd on timber frame ck, plasterboard on dab	s							9.00 75.00	180.27 68.12
10.0 External Roofs	There -	0			Vel	V	0	N-44	Oh-W	Oh - !"	Onless C	
Description	Туре	Construction	ı			Kappa kJ/m²K).	Gross Area(m²)	Area		Shelter Factor	Calculation Type	mopening
External Pitched Roofs	External Plan Roof	e Plasterboard,	insulated at ceiling leve	el 	0.09	9.00	61.05	(m²) 61.05	None	0.00	Calculate Wall Area	
10.2 Internal Ceilings Description Internal Ceiling		Storey Lowest occupied	Construction Plasterboard ceiling									ea (m²) 61.05

SAP 10 Online 2.12.2 Page 1 of 3



11.0 Heat Loss Floors											
Description	Туре	Storey Index	C	Construction		U-Valu (W/m²ł		Shelter Code		elter Kap ctor (kJ/m	pa Area (m²) ı²K)
Ground Floor	Ground Floor - Solid	Lowest occup	ied S	Suspended concrete floor	, carpeted	0.12		None	0	.00 75.0	61.05
11.2 Internal Floors Description		Storey Index	Const	ruction						Kappa (kJ/m²K)	
Internal Floor			Plaste	rboard ceiling, carpe	eted chipboard floo	or				9.00	61.05
12.0 Opening Types											
Description	Data Source	Туре		Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwell Entrance Doo New Dwell DG French Doors	or Manufacturer Manufacturer	Half Glaze Window	d Door	Double Low-E S		·		0.36 0.71	,,	0.70 0.70	1.20 1.20
New Dwelling DG Windo	w Manufacturer	Window		Double Low-E S	Soft 0.05			0.71		0.70	1.20
Name Front West Door Front West Windows Front West Window Side North Windows Rear East Windows Rear West Windows Side North Door	Opening Ty New Dwell E New Dwellin New Dwellin New Dwellin New Dwellin New Dwell E New Dwell E	Entrance Doo g DG Windo g DG Windo g DG Windo g DG Windo DG French D	or E bw E bw E bw E bw E boors E	ocation xternal Cavity Wall xternal Tile Hung Wall xternal Cavity Wall	all	Orienta East East East North Wes Wes	t t	Area (2.0' 4.4' 1.90 1.80 4.92 3.35 1.95	1 1 0 0 2 5	P	itch
14.0 Conservatory			N	one							
15.0 Draught Proofing			10	00				%			
16.0 Draught Lobby			N	0							
47.0 The				oloder B.U							
17.0 Thermal Bridging 17.1 List of Bridges			C	alculate Bridges							
E2 Other lintels (includin E3 Sill E4 Jamb E5 Ground floor (normal E6 Intermediate floor wit E10 Eaves (insulation at E12 Gable (insulation at E16 Corner (normal) E17 Corner (inverted – in external area)) hin a dwelling ceiling level) ceiling level)	,	Indeper Indeper Indeper Indeper Indeper Indeper	endently assessed endently assessed	14.53 13.57 33.30 32.26 32.26 29.36 2.90 25.38 4.78	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	0.05 0.02 0.01 0.07 0.00 0.06 0.06 0.05 -0.10	IG or Keysto Recognised Recognised Recognised Recognised Recognised Recognised Recognised	Construct Construct Construct Construct Construct Construct Construct	ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail ction Detail	I No I No I No I No I No
Y-value			0.	.00				W/m²K			
18.0 Pressure Testing			Y	es							
Designed AP ₅₀			5.	.05				m³/(h.m²	²) @ 50 P	а	
Test Method			В	lower Door							
19.0 Mechanical Ventilation	n										
Mechanical Ventilation								\neg			
Mechanical Ventila	tion System Pres	ent	N	0							
20.0 Fans, Open Fireplace	s, Flues										
21.0 Fixed Cooling System	1		N	0							
22.0 Lighting			_								
No Fixed Lighting			N		C#i	Davi			-14	0	4
			Low	Name energy Lighting	Efficacy 75.00	Pow 15		Capa 112			ount 36
24.0 Main Heating 1			D	atabase							
Description			E	lectric Air Source He	eat Pump						
Percentage of Heat			10	00.00				%			
Database Ref. No.			10	06473							
Fuel Type			E	lectricity							
In Winter			0.	.00							
In Summer			0.	.00							
Model Name			E	DLA06EV3				$\bar{\Box}$			
			_								

SAP 10 Online 2.12.2 Page 2 of 3



	£4,000 - £6,000 £46 £3,500 - £5,500 £205	AP rating Environmental Impact B 84 A 97 B 89 A 97 0 0
Lower cost measures None Further measures to achieve even higher stand	Turical Cost Turical covings nonvess	Ratings after improvement
Recommendations		<u> </u>
31.0 Thermal Store	None	
In Airing Cupboard	No	
Pipes insulation	Fully insulated primary pipework	
Loss	1.50	kWh/day
Cylinder Volume	210.00	L
Insulation Type	Measured Loss	
Independent Time Control	Yes	
Cylinder In Heated Space	Yes	
Cylinder Stat	Yes	
29.0 Hot Water Cylinder	Hot Water Cylinder	
28.3 Waste Water Heat Recovery System		
Immersion Only Heating Hot Water	No	
Bath Count	1	_
Cold Water Source	From mains	
Water use <= 125 litres/person/day	Yes	
Solar Panel	No	
Waste Water Heat Recovery Storage System	No	
Waste Water Heat Recovery Instantaneous System	2 No	
Waste Water Heat Recovery Instantaneous System	1 No	
Flue Gas Heat Recovery System	No	
SAP Code	901	
28.0 Water Heating Water Heating	Main Heating 1	
Heat source 2 Heat source 3 Heat source 4 Heat source 5		
Heat source 1	Heat Power Ratio	
Heat Source Fuel Type Hea	ing Use Efficiency Percentage Of Heat Heat	Electrical Fuel Factor Efficiency typ
26.0 Heat Networks	None	
25.0 Main Heating 2	None	
Flow Temperature Value	55.00	
Flow Temperature	Enter value	
Heat Emitter	Radiators	
Heating Pump Age	2013 or later	
Is MHS Pumped	Pump in heated space	
PCDF Controls	0	
Controls SAP Code	2207	
System Type	Heat Pump	

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Thermal Bridging



Property Reference	sc100242 P15 Bitterne Church				ssued on Date	06/12/2023		
Assessment Reference	001		Type Ref De	etached House				
Property	Plot 15, Bitterne Parish	Plot 15, Bitterne Parish Church, Whites Lane, Southampton, Hampshire , SO19 7NP						
SAP Rating		83 B	DER	3.82	TER	10.86		
Environmental 96 A			% DER < TER	64.83				
CO ₂ Emissions (t/year)		0.38	DFEE	41.04	TFEE	42.23		
Compliance Check		See BREL	% DFEE < TFEE			2.82		
% DPER < TPER		30.36	DPER	39.61	TPER	56.87		
Assessor Details	Mr. Mark Rogers Assessor ID A320-000					A320-0001		
Client	Vivid Design Studio, Philip D	udley						

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	14.53	0.73	IG or Keystone Hi Therm +
External wall	E3 Sill	Independently assessed	0.018	13.57	0.24	Recognised Construction Detail
External wall	E4 Jamb	Independently assessed	0.014	33.30	0.47	Recognised Construction Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.068	32.26	2.19	Recognised Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.001	32.26	0.03	Recognised Construction Detail
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	29.36	1.61	Recognised Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	2.90	0.17	Recognised Construction Detail
External wall	E16 Corner (normal)	Independently assessed	0.051	25.38	1.29	Recognised Construction Detail
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.100	4.78	-0.48	Recognised Construction Detail

Total: 188.34 W/mK: Y-Value: 0.00 W/m²K:

SAP 10 Online 2.12.2 Page 1 of 1



Property Reference	sc121846				Issued on Date	06/12/2023					
Assessment Reference	001	001 Prop Type Ref									
Project	Plot 15, Bitterne Parish C	Plot 15, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP									
Calculation Type	New Build (As Designed)	New Build (As Designed)									
SAP Rating	84 B	DER	15.68	TER	25.60						
Environmental		86 B	% DER <ter< th=""><th></th><th>38.75</th><th></th></ter<>		38.75						
CO ₂ Emissions (t/ye	ar)	1.55	DFEE	47.11	TFEE	58.45					
General Requireme	nts Compliance	Pass	% DFEE <tfee< th=""><th></th><th>19.40</th><th></th></tfee<>		19.40						
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001											
Client	Vivid Design Studio, Vivid Desi	gn Studio				d Design Studio, Vivid Design Studio					

Building Elements

Roof 000002 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Layer	Description	(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.0400	
ayer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
ayer 2	Mineral wool				
	Main construction	350	0.0440	7.9545	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
ayer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	93.67
	Main construction	150	0.1300	1.1538	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or				
	plastic				
ayer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
nt surface				0.1000	

otal resistance. Opper mine = 11.445 m ky v

Total correction = $0.0030 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.09 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 513 mm U-value: 0.09 W/m² K Kappa: n/a





Property Reference	sc121846	sc121846				06/12/2023		
Assessment Reference	001			Prop Type Ref	pp Type Ref New Dwelling Part L 2021			
Project	Plot 15, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	NP		
Calculation Type	New Build (As Designed)	ew Build (As Designed)						
SAP Rating	84 B	DER	15.68	TER	25.60			
Environmental		86 B	% DER <ter< th=""><th></th><th colspan="4">38.75</th></ter<>		38.75			
CO ₂ Emissions (t/year)		1.55	DFEE	47.11	TFEE	58.45		
General Requirements	Compliance	Pass	% DFEE <tfe< th=""><th>Ε</th><th>19.40</th><th></th></tfe<>	Ε	19.40			
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001								
Client	id Design Studio, Vivid Desi	gn Studio						

Building Elements

Wall 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	(mm)	Conductivity (W/m ² K)	(m ² K/W)	Fraction (%)
Ext surface				0.0400	. ,
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	125	0.0340	3.6765	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties,				
	Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K,				
_	per m ² : 2.500				
Layer 3	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity:				
	Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W

Total correction = $0.0018 \text{ m}^2 \text{ K/W}$ U-value (unrounded) = $0.22 \text{ W/m}^2 \text{ K}$

Unheated space: None

Total thickness: 355 mm U-value: 0.22 W/m² K Kappa: n/a





Property Reference	sc121846				Issued on Date	06/12/2023	
Assessment Reference	001	001 Pro				2021	
Project	Plot 15, Bitterne Parish C	Plot 15, Bitterne Parish Church, Whites Lane, Bitterne, Southampton, Hampshire , SO19 7NP					
Calculation Type	New Build (As Designed)	New Build (As Designed)					
SAP Rating	84 B	DER	15.68	TER	25.60		
Environmental		86 B	% DER <ter< th=""><th colspan="4">R<ter 38.75<="" th=""></ter></th></ter<>	R <ter 38.75<="" th=""></ter>			
CO ₂ Emissions (t/ye	ar)	1.55	DFEE	47.11	TFEE	58.45	
General Requireme	nts Compliance	Pass	% DFEE <tfe< th=""><th>E</th><th>19.40</th><th></th></tfe<>	E	19.40		
Assessor Details	Mr. Mark Rogers, Surecalc Lim	Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001					
Client	Vivid Design Studio, Vivid Desi	d Design Studio, Vivid Design Studio					

Building Elements

Wall 000004 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface		(111111)	(VV) III K)	0.0400	(70)
Layer 1	Tile Hanging				
•	Main construction	15	1.0000	0.0150	100.00
ayer 2	airspace/timber battens				
•	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity: Normal				
ayer 3	Blockwork, medium				
, ,	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
ayer 4	Knauf Supafil 34 blown Cavity Fill				
	Main construction Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm², Lambda: 17.000 W/m.K, per m²: 2.500	125	0.0340	3.6765	100.00
yer 5	Masterblock Masterlite Ultra				
,	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 6	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction Corrections - Cavity Unventilated, Emissivity: Normal	15	0.0882	0.1700	20.00
Layer 7	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
t surface				0.1300	

Total correction = 0.0016 m² K/W U-value (unrounded) = 0.21 W/m² K

Unheated space: None

> Total thickness: 390 mm U-value: 0.21 W/m² K Kappa: n/a



Regs Region: England Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19



Property Reference sc121846					Issued on Date	06/12/2023		
Assessment Reference 001		Prop Type Ro		Prop Type Ref	New Dwelling Part L 2021			
Project	Plot 15, Bitterne Parish Ch	nurch, Whites	Lane, Bitterne	, Southampton,	Hampshire , SO19 7	NP		
Calculation Type	New Build (As Designed)							
SAP Rating	84 B	DER	15.68	TER	25.60			
Environmental	86 B	% DER <ter< th=""><th></th><th colspan="5">38.75</th></ter<>		38.75				
CO ₂ Emissions (t/year)	1.55	DFEE	47.11	TFEE	58.45			
General Requirements	Pass	% DFEE <tfe< th=""><th>E</th><th colspan="5">19.40</th></tfe<>	E	19.40				
Assessor Details Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk Assessor ID A320-0001								
Client Vivid Design Studio, Vivid Design Studio								

Building Elements

Floor 000003 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 61.05 m², Perimeter = 32.26 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.150 m U-value of walls above ground:Uw = 0.220 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Layer		(mm)	(W/m²K)	(m²K/W)	(%)
Ext surface				0.1700	
Layer 1	Blockwork				
	Main construction	100	0.1900	0.5263	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners	: None or			
	plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	
Total resistan	ce: Upper limit = 7.709 m² K/W	.ower limit = 7.603 m ²	K/W	Average =	7.656 m²
	Total correction = 0.0079 m ² K/W	U-value (เ	unrounded) =	0.12 W/m ²	K

Unheated space: None

Total thickness: 325 mm U-value: 0.12 W/m² K Kappa: n/a

