

ASSESSMENT NOTES

Calculation Type: New Build (As Designed)

Property Reference	7358-0001-HD-SD-21182				Issued on Date	08/12/2021
Assessment Reference	Proposed		Prop Type Ref			
Property	Proposed dwelling , Crete House, Dappers Lane, Angmering, Littlehampton					
SAP Rating	102 A	DER	-0.71	TER	22.19	
Environmental	101 A	% DER<TER	103.20			
CO ₂ Emissions (t/year)	-0.68	DEEE	43.29	TTEE	56.95	
General Requirements Compliance	Pass	% DEEE<TTEE	23.98			
Assessor Details	Mr. James Turner, J E Turner, [REDACTED]				Assessor ID	7358-0001
Client	[REDACTED]					

ASSESSMENT NOTES - Last time updated on: 08.12.2021

Kingspan Tek Accredited Construction Details to be used to limit thermal bridging

100% low energy light fittings

Space heating and hot water provided by Air source heat pump with time and temperature zone control of underfloor space heating. Pre plumbed 300 litre hot water cylinder

U value of external doors to be no worse than 1.2W/m2.K,, Triple glazed doors and triple glazed windows and roof lights to be no worse than 1.2W/m2.K,

Air tightness to achieve 5.0m3/hr/m2

U values of walls to be no worse than 0.16W/m2.K,

U values of roof to be no worse than 0.16W/m2.K,

U values of floor to be no worse than 0.11W/m2.K,

5.0 Kw solar PV system on South elevation roof

BASIC COMPLIANCE REPORT

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Environmental	101 A	TER	22.19
CO₂ Emissions (t/year)	-0.68	% DER<TER	103.20
General Requirements Compliance	Pass	DFEE	43.29
		TFEE	56.95
		% DFEE<TFEE	23.98
Assessor Details	Mr. James Turner, J E Turner	Assessor ID	7358-0001
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SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	22.19	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	-0.71	kgCO ₂ /m ²	Pass
	-22.90 (-103.2%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.95	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	43.29	kWh/m ² /yr	
	-13.7 (-24.0%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.16 (max. 0.70)	Pass
Floor	0.11 (max. 0.25)	0.11 (max. 0.70)	Pass
Roof	0.14 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.08 (max. 2.00)	1.20 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

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

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Heat pump with radiators or underfloor - Electric Mitsubishi Electric Ecodan 11.2 kW PUZ-WM112VAA	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

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Hot water storage

Measured cylinder loss: 2.25 kWh/day
Permitted by DBSCG 2.86

Pass

Primary pipework insulated

Yes

Pass

6 Controls

Space heating controls

Time and temperature zone control

Pass

Hot water controls

Cylinderstat

Pass

Independent timer for DHW

Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings

100

%

Minimum

75

%

Pass

8 Mechanical ventilation

Not applicable

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Southern England)

Slight

Pass

Based on:

Overshading

Average

Windows facing North

0.81 m², No overhang

Windows facing East

14.91 m², No overhang

Windows facing South

2.84 m², No overhang

Windows facing West

19.70 m², No overhang

Air change rate

4.00 ach

Blinds/curtains

None

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

5.00 (design value)

Maximum

10.0

Pass

10 Key features

External wall U-value

0.12

W/m²K

Roof U-value

0.12

W/m²K

Floor U-value

0.11

W/m²K

Window U-value

1.00

W/m²K

Roof window U-value

1.00

W/m²K

Photovoltaic array

5.00

kW

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

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Environmental	101 A	% DER-TER	103.20
CO ₂ Emissions (t/year)	-0.68	DEREE	43.29
General Requirements Compliance	Pass	% DEREE-TREE	56.95
Assessor Details	Mr. James Turner, J E Turner	Assessor ID	7358-0001
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SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	3
3.0 Date Built	2021
4.0 Sheltered Sides	1
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements	Heat Loss Perimeter	Internal floor Area	Average Storey Height
	Ground Floor:	38.46 m	85.44 m ²
	1st Storey:	38.46 m	80.67 m ²
	2nd Storey:	20.92 m	26.42 m ²

7.0 Living Area	36.30	m ²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	75.98	kJ/m ² K

9.0 External Walls						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Sips panel wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.16	9.00	194.22	152.18
Stud to eaves	Timber Frame	Timber framed wall (one layer of plasterboard)	0.12	9.00	31.38	31.38

9.2 Internal Walls				
Description	Construction		Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame		9.00	303.81

10.0 External Roofs						
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Flat roof	External Flat Roof	Plasterboard, insulated flat roof	0.16	9.00	18.48	18.07
Skilling	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	17.16	15.32
Eaves void	External Plane Roof	Plasterboard, insulated at ceiling level	0.12	9.00	54.25	54.25

10.2 Internal Ceilings

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	80.67
Internal Ceiling 2	Plasterboard ceiling, carpeted chipboard floor	9.00	26.42

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Heat Loss Floor 1	Ground Floor - Solid	Other	0.11	65.52	85.44

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	80.67
Internal Floor 2	Plasterboard ceiling, carpeted chipboard floor	18.00	26.42

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Entrance door + screen	Manufacturer	Half Glazed Door	Triple Low-E Soft 0.05			0.57		0.70	1.20
Bi Fold doors	Manufacturer	Window	Triple Low-E Soft 0.05			0.57		0.70	1.20
Windows	Manufacturer	Window	Triple Low-E Soft 0.05			0.57		0.70	1.00
Roof lights	Manufacturer	Roof Window	Triple Low-E Soft 0.05			0.57		0.70	1.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Opening 1	Half Glazed Door	[1] Sips panel wall	West							3.78	
Opening 2	Window	[1] Sips panel wall	East	None	0.00					14.91	
Opening 3	Window	[1] Sips panel wall	West	None	0.00					14.78	
Opening 4	Window	[1] Sips panel wall	West	None	0.00					4.92	
Opening 5	Window	[1] Sips panel wall	South	None	0.00					2.84	
Opening 6	Window	[1] Sips panel wall	North	None	0.00					0.81	
Opening 7	Roof Window	[2] Skilling	East	None						1.84	
Opening 8	Roof Window	[1] Flat roof	Horizontal	None						0.41	

14.0 Conservatory

15.0 Draught Proofing

%

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

SUMMARY FOR INPUT DATA

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Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	26.60	0.050	Yes	Kingspan Tek psi value W8
Independently assessed	E3 Sill	24.80	0.040	Yes	Kingspan Tek psi value W7A
Independently assessed	E4 Jamb	36.30	0.060	Yes	Kingspan Tek psi value W6B
Independently assessed	E5 Ground floor (normal)	21.64	0.140	No	Kingspan Tek psi value W4A
Independently assessed	E5 Ground floor (normal)	16.82	0.130	No	Kingspan Tek psi value W4B
Independently assessed	E6 Intermediate floor within a dwelling	59.38	0.110	Yes	Kingspan Tek psi value F4
Independently assessed	E11 Eaves (insulation at rafter level)	35.28	0.090	No	Kingspan Tek psi value R1
Independently assessed	E13 Gable (insulation at rafter level)	9.97	0.030	No	Kingspan Tek psi value R12
Table K1 - Default	E14 Flat roof	16.68	0.080	No	Kingspan Tek psi value W9A
Independently assessed	E16 Corner (normal)	36.90	0.030	No	Kingspan Tek psi value W5A-Ext
Independently assessed	E17 Corner (inverted – internal area greater than external area)	9.50	-0.030	No	Kingspan Tek psi value W5A-int
Table K1 - Default	R1 Head of roof window	2.01	0.080	Yes	
Table K1 - Default	R2 Sill of roof window	2.01	0.060	Yes	
Table K1 - Default	R3 Jamb of roof window	6.52	0.080	Yes	
Table K1 - Default	R6 Flat ceiling	16.68	0.060	No	
Independently assessed	R8 Roof to wall (rafter)	20.92	0.000	No	Kingspan Tek psi value R2C

Y-value: W/m²K

18.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Property Tested ?

As Built AP₅₀ m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather

Cross ventilation possible

Night Ventilation

Air change rate

Mechanical Ventilation

Mechanical Ventilation System Present

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				7
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System

22.0 Lighting

Internal

Total number of light fittings

Total number of L.E.L. fittings

Percentage of L.E.L. fittings %

External

External lights fitted

Light and motion sensor

23.0 Electricity Tariff

24.0 Main Heating 1

SUMMARY FOR INPUT DATA

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Description	Air source heat pump				
Percentage of Heat	100	%			
Database Ref. No.	104649				
Fuel Type	Electricity				
Main Heating	PET				
SAP Code	224				
In Winter	386.9				
In Summer	293.6				
Controls	CHD Time and temperature zone control				
PCDF Controls	0				
Sap Code	2207				
Is MHS Pumped	Pump in heated space				
Heat Emitter	Underfloor				
Underfloor Heating	Yes - Pipes in thin screed				
Flow Temperature	36° - 45°C				
25.0 Main Heating 2	None				
Community Heating	None				
28.0 Water Heating	HWP From main heating 1				
Water Heating	Main Heating 1				
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				
SAP Code	901				
Immersion Only Heating Hot Water	Yes				
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	300.00	L			
Loss	2.25	kWh/day			
Pipes insulation	Fully insulated primary pipework				
31.0 Thermal Store	None				
32.0 Photovoltaic Unit	One Dwelling				
PV Cells kWp	Orientation	Elevation	Overshading	Connected to Dwelling	
5.00	South	45°	None Or Little	Yes	

Recommendations

Lower cost measures

SUMMARY FOR INPUT DATA

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None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement	
			SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£99	A 103	

U-VALUE CALCULATOR REPORT

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Environmental	101 A	% DER < TER	103.20		
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General Requirements Compliance	Pass	% DERF < TERF	23.98		

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Client	
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Building Elements

Floor Ground floor - Floor - suspended beam-and-block floor

Floor Type: Suspended Floor

Area = 85.44 m², Perimeter = 38.46 m, Wall thickness = 300.00 mm, Soil: Clay

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

Floor height above ground: h = 0.500 m

U-value of walls above ground: U_w = 0.160 W/m²K

Ventilation openings per perimeter length: e = 0.0015 %

Mean wind speed: v = 5.000 m/s

Resistance on solum: R_g = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)	Density (kg/m ³)	Heat Cap. (J/kgK)
Ext surface				0.1700			
Layer 1	beam and block floor						
	Main construction	100	1.1900	0.0840	86.30		
	Main construction	100	1.3500	0.0741	13.70		
Layer 2	Kooltherm K3 Floorboard (45mm +)						
	Main construction	150	0.0200	7.5000	100.00		
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Layer 3	Screed						
	Main construction	65	1.1500	0.0565	100.00	1200	840
Int surface				0.1700			

Total resistance: Upper limit = 7.979 m² K/W Lower limit = 7.979 m² K/W Average = 7.979 m² K/W

Total correction = 0.0088 m² K/W

U-value (unrounded) = 0.11 W/m² K

Unheated space: None

Total thickness: 315 mm

U-value: 0.11 W/m² K

Kappa: 65.52 kJ/m² K

THERMAL BRIDGING

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Assessor Details	Mr. James Turner, J E Turner, [REDACTED]			Assessor ID	7358-0001
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	Junction detail	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	26.60	1.33	Kingspan Tek psi value W8
External wall	E3 Sill	Independently assessed	0.040	24.80	0.99	Kingspan Tek psi value W7A
External wall	E4 Jamb	Independently assessed	0.060	36.30	2.18	Kingspan Tek psi value W6B
External wall	E5 Ground floor (normal)	Independently assessed	0.140	21.64	3.03	Kingspan Tek psi value W4A
External wall	E5 Ground floor (normal)	Independently assessed	0.130	16.82	2.19	Kingspan Tek psi value W4B
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.110	59.38	6.53	Kingspan Tek psi value F4
External wall	E11 Eaves (insulation at rafter level)	Independently assessed	0.090	35.28	3.18	Kingspan Tek psi value R1
External wall	E13 Gable (insulation at rafter level)	Independently assessed	0.030	9.97	0.30	Kingspan Tek psi value R12
External wall	E14 Flat roof	Table K1 - Default	0.080	16.68	1.33	Kingspan Tek psi value W9A
External wall	E16 Corner (normal)	Independently assessed	0.030	36.90	1.11	Kingspan Tek psi value WSA-Ext
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.030	9.50	-0.29	Kingspan Tek psi value WSA-int
External roof	R1 Head of roof window	Table K1 - Default	0.080	2.01	0.16	
External roof	R2 Sill of roof window	Table K1 - Default	0.060	2.01	0.12	
External roof	R3 Jamb of roof window	Table K1 - Default	0.080	6.52	0.52	
External roof	R6 Flat ceiling	Table K1 - Default	0.060	16.68	1.00	
External roof	R8 Roof to wall (rafter)	Independently assessed	0.000	20.92	0.00	Kingspan Tek psi value R2C

Total: 23.68 W/mK:
Y-Value: 0.059 W/m²K: