



Kingspan Timber Solutions Limited
Eltisley Road, Great Gransden,
Bedfordshire SG19 3AR, UK

**Seafever
188 Elmer Road
Bognor Regis
West Sussex
PO22 6JA**

20 July 2021

Re: SAP Report

To whom it may concern,

The SAP report has been prepared for the proposed replacement dwelling, and demonstrates an improvement of 48.78% over that of a notional building (target) for the Carbon Emission Rate (DER), and an improvement of 27.53% over that of a notional building (target) for the Dwelling Fabric Efficiency Rate (DFEE).

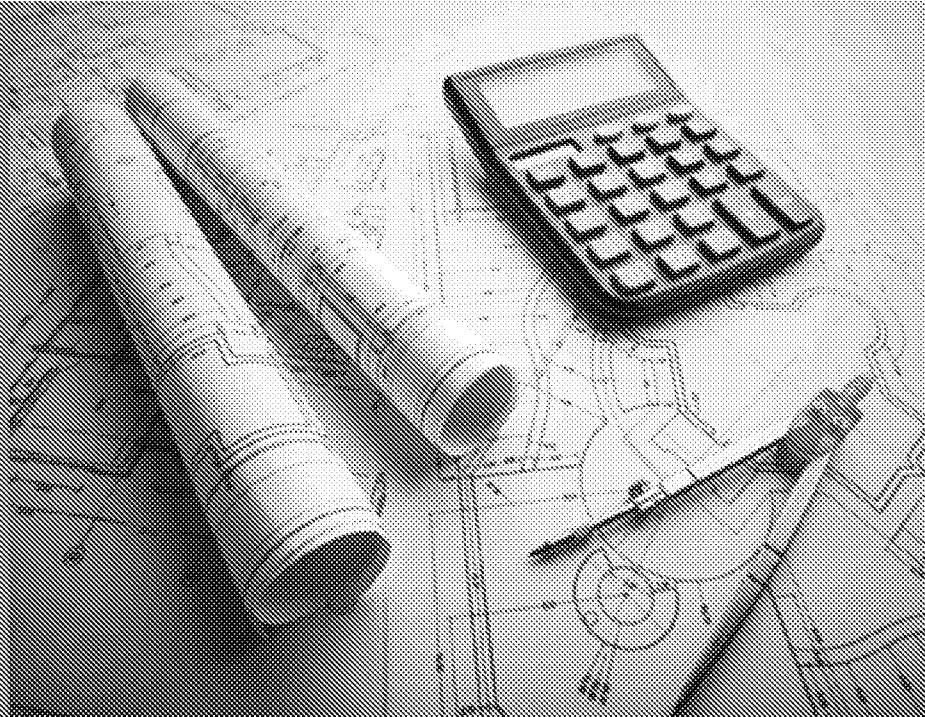
It should be noted that the existing structure, to be demolished shows signs of subsidence, is of sub-standard construction in todays standards, and is not energy efficient at all.

I trust the above meets with your favorable consideration and approval.

Yours Sincerely

David Gilling

RIBA (20014194), OCDEA (T360-0001)



SAP Report Submission for Building Regulations Compliance

Client: Mr & Mrs Caplin

Project: Seafever, 188, Elmer Road
Bognor Regis, West Sussex, PO22 6JA

Contact: David Stirling
David Stirling

Report Issued

EXCELLENCE
IN ENERGY
ASSESSMENT

PREDICTED ENERGY ASSESSMENT

Design SAP
elmhurst energy

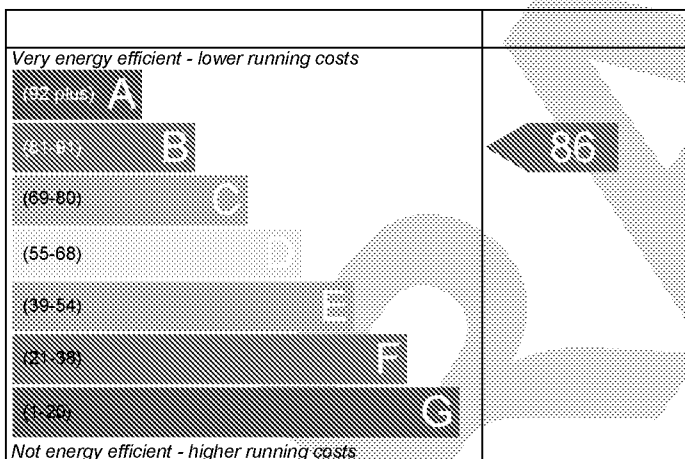
Seafever, 188, Elmer Road,
Bognor Regis,
West Sussex,
PO22 6JA

Dwelling type: House, Detached
Date of assessment: 20/07/2021
Produced by: David Stirling
Total floor area: 275.44 m²

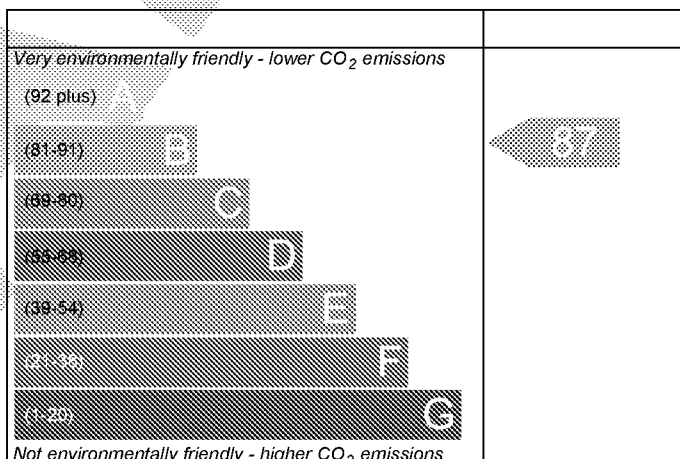
This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance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

The energy performance has been assessed using the Government approved SAP2012 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



Environmental Impact (CO₂) Rating



England

EU Directive
2002/91/EC

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.

England

EU Directive
2002/91/EC

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.

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

BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	18-070				Issued on Date	20/07/2021		
Assessment Reference	001			Prop Type Ref	Detached Triple Storey			
Property	Seafever, 188, Elmer Road, Bognor Regis, West Sussex, PO22 6JA							
SAP Rating	86 B	DER	11.65	TER	22.74			
Environmental	87 B	% DER<TER	48.78					
CO ₂ Emissions (t/year)	2.52	DFEE	45.83	TFEE	63.24			
General Requirements Compliance	Pass	% DFEE<TFEE	27.53					
Assessor Details	Mr. David Stirling, David Stirling, Tel: 07956 301865, david.stirling@kingspan.com					Assessor ID	T360-0001	
Client								

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)	22.74	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.65	kgCO ₂ /m ²	Pass
	-11.09 (-48.8%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	63.24	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	45.83	kWh/m ² /yr	
	-17.4 (-27.5%)	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	0.16 (max. 0.25)	0.21 (max. 0.70)	Pass
Roof	0.18 (max. 0.20)	0.18 (max. 0.35)	Pass
Openings	0.85 (max. 2.00)	1.40 (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	3.00 (design value)	m ³ /(h.m ²) @ 50 Pa	
Maximum	10.0	m ³ /(h.m ²) @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Heat pump with radiators or underfloor - Electric Air-to-water heat pump	
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BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Secondary heating system

None

5 Cylinder insulation

Hot water storage

Nominal cylinder loss: 2.55 kWh/day
Permitted by DB5CG 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

Continuous supply and extract system

Specific fan power

1.32

Maximum

1.5

Pass

MVHR efficiency

86

%

Minimum

70

%

Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)

Medium

Pass

Based on:

Overshading

Average

Windows facing North

12.84 m², No overhang

Windows facing East

1.81 m², No overhang

Windows facing South

41.27 m², No overhang

Windows facing West

3.13 m², No overhang

Air change rate

4.00 ach

Blinds/curtains

None

Criterion 4 – Building performance consistent with DER and DPEF rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

m³/(h.m²) @ 50 Pa

Maximum

10.0

m³/(h.m²) @ 50 Pa

Pass

10 Key features

Window U-value

0.80

W/m²K

Window U-value

0.80

W/m²K

Air permeability

3.0

m³/m²h

Photovoltaic array

2.00

kW

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Regs Region: England
Elmhurst Energy Systems
SAP2012 Calculator (Design
System) version 4.14r17

RECOMMENDATIONS

Design SAP
elmhurst energy

	Typical cost	Typical savings per year	Energy efficiency	Environmental impact	Result
Low energy lights			0	0	Already installed
Solar water heating	£4,000 - £6,000	£102	B 87	B 88	Recommended
Photovoltaic			0	0	Already installed
Wind turbine			0	0	Not applicable
Totals	£4,000 - £6,000	£102	B 87	B 88	

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ASSESSMENT NOTES

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

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Property	Seafever, 188, Elmer Road, Bognor Regis, West Sussex, PO22 6JA		

SAP Rating	86 B	DER	11.65	TSL	22.74
Environmental	87 B	% DER<TER	48.78		
CO ₂ Emissions (t/year)	2.52	DPEE	45.83	TPEE	63.24
General Requirements Compliance	Pass	% DPEE<TPEE	27.53		

Assessor Details	Mr. David Stirling, David Stirling, Tel: 07956 301865, david.stirling@kingspan.com	Assessor ID	T360-0001
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Client	
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ASSESSMENT NOTES - Last time updated on: 20.07.2021

This assessment prepared for Planning Application.

Based on Rev G.

Attached garage not assumed to be part of the heated volume.

Window and Door specification and u-values assumed at this stage - owner has specified triple glazing.

Pressure test assumed at 3.0 due to an MVHR being used.

Type of MVHR used is assumed at this stage.

100% energy efficient lighting assumed.

Underfloor heating assumed and no radiators.

No secondary heating device is assume (i.e. no woodburners or electrical fireplace).

2kW peak assumed in PV

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

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	-11.09 (-48.8%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	63.24	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	45.83	kWh/m ² /yr	
	-17.4 (-27.5%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

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Roof	0.18 (max. 0.20)	0.18 (max. 0.35)	Pass
Openings	0.85 (max. 2.00)	1.40 (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	3.00 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Heat pump with radiators or underfloor - Electric Air-to-water heat pump	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Hot water storage

Nominal cylinder loss: 2.55 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

Continuous supply and extract system

Specific fan power

1.32

Maximum

1.5

Pass

MVHR efficiency

86

%

Minimum

70

%

Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)

Medium

Pass

Based on:

Overshading

Average

Windows facing North

12.84 m², No overhang

Windows facing East

1.81 m², No overhang

Windows facing South

41.27 m², No overhang

Windows facing West

3.13 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

3.00 (design value)

Maximum

10.0

Pass

10 Key features

Window U-value

0.80

W/m²K

Window U-value

0.80

W/m²K

Air permeability

3.0

m³/m²h

Photovoltaic array

2.00

kW

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CO ₂ Emissions (t/year)	2.52	DEREE	45.83
General Requirements Compliance	Pass	% DEREE<TEEE	27.53
Assessor Details	Mr. David Stirling, David Stirling, Tel: 07956 301865, david.stirling@kingspan.com		Assessor ID
Client	T360-0001		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	North
Property Tenure	Owner-occupied
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	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground Floor:	44.90 m	90.52 m ²
	1st Storey:	46.80 m	112.18 m ²
	2nd Storey:	38.34 m	72.74 m ²

7.0 Living Area	80.81	m ²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	60.11	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)	
External Wall Render	Timber Frame	Timber framed wall (one layer of plasterboard)	0.15	9.00	358.16	299.11	
External Wall Garage	Timber Frame	Timber framed wall (two layers of plasterboard)	0.16	18.00	18.25	16.34	

9.2 Internal Walls							
Description	Construction			Kappa (kJ/m ² K)	Area (m ²)		
Internal Wall - GR	Plasterboard on timber frame			9.00	176.64		
Internal Wall FR	Plasterboard on timber frame			9.00	88.56		
Internal Wall SC	Plasterboard on timber frame			9.00	92.88		

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)	
External Roof Flat	External Flat Roof	Plasterboard, insulated flat roof	0.18	9.00	109.25	105.39	

11.0 Heat Loss Floors

Regs Region: England
Elmhurst Energy Systems
SAP2012 Calculator (Design System) version 4.14r17

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Heat Loss Floor Ground	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	74.95
Heat Loss Floor Garage	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.20	20.00	15.57
Heat Loss Floor Jetty	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.21	20.00	6.89

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor FR	Plasterboard ceiling, carpeted chipboard floor	18.00	112.18
Internal Floor SC	Plasterboard ceiling, carpeted chipboard floor	18.00	72.74

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Triple Low-E Soft 0.05			0.57		0.70	0.80
Glazed Doors	Manufacturer	Window	Triple Low-E Soft 0.05			0.57		0.70	0.80
Solid Doors	Manufacturer	Solid Door							1.40
Rooflights	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Windows - N	Window	[1] External Wall Render	North	None	0.00					6.38	
Glazed Doors - N	Window	[1] External Wall Render	North	None	0.00					6.46	
Windows - W	Window	[1] External Wall Render	West	None	0.00					3.13	
Solid Door	Solid Door	[2] External Wall Garage	West							1.91	
Glazed Doors - S	Window	[1] External Wall Render	South	None	0.00					41.27	
Windows - E	Window	[1] External Wall Render	East	None	0.00					1.81	
Rooflights	Roof Window	[1] External Roof Flat	Horizontal	None						3.86	

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

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	37.48	0.099	Yes	Award Data
Independently assessed	E3 Sill	14.05	0.064	No	Award Data
Independently assessed	E4 Jamb	49.50	0.089	Yes	Award Data
Independently assessed	E5 Ground floor (normal)	44.90	0.096	Yes	Award Data
Table K1 - Default	E19 Ground floor (inverted)	3.20	0.070	No	
Table K1 - Default	E20 Exposed floor (normal)	3.20	0.320	No	
Independently assessed	E6 Intermediate floor within a dwelling	35.14	0.063	Yes	Award Data
Table K1 - Default	E8 Balcony within a dwelling, wall insulation continuous	9.40	0.000	No	
Table K1 - Default	E15 Flat roof with parapet	64.81	0.560	No	
Independently assessed	E16 Corner (normal)	35.20	0.063	No	Award Data
Independently assessed	E17 Corner (inverted -- internal area greater than external area)	5.10	-0.029	No	Award Data
Table K1 - Default	R1 Head of roof window	2.90	0.080	Yes	
Table K1 - Default	R2 Sill of roof window	2.90	0.060	Yes	
Table K1 - Default	R3 Jamb of roof window	10.64	0.080	Yes	

Y-value	0.105	W/m ² K
18.0 Pressure Testing	Yes	
Designed AP ₅₀	3.00	m ³ /(h.m ²) @ 50 Pa
Property Tested ?		
As Built AP ₅₀		m ³ /(h.m ²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows half open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved installation	No
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500343
Configuration	5
MVHR Duct Insulated	No
Manufacturer SFP	1.32
Duct Type	Rigid
MVHR Efficiency	85.00
Wet Rooms	5

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				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No
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22.0 Lighting

Regs Region: England
Elmhurst Energy Systems
SAP2012 Calculator (Design
System) version 4.14r17

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Design SAP
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Internal	
Total number of light fittings	24
Total number of L.E.L. fittings	24
Percentage of L.E.L. fittings	100.00 %
External	
External lights fitted	Yes
Light and motion sensor	Yes
23.0 Electricity Tariff	
	Standard
24.0 Main Heating 1	
	SAP table
Description	ASHP
Percentage of Heat	100 %
Main Heating	PEQ
SAP Code	214
Efficiency (SAP Table)	249.9 %
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	<= 35°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
Supplementary Immersion	No
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	Foam
Insulation Thickness	80 mm
Cylinder Volume	300.00 L

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Pipes insulation Fully insulated primary pipework

31.0 Thermal Store None

32.0 Photovoltaic Unit One Dwelling

PV Cells kWp

2.00

Orientation

Horizontal

Elevation

Horizontal

Overshading

None Or Little

Connected to Dwelling

Yes

Recommendations

Lower cost measures

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	£102	B 87	