2 Britannia Street
London
WCIX 9JE

Mechanical, Electrical and Public Health Engineering Services

Energy Strategy Report

Document Reference: 5105/01/06/PCR Rev B

Cooper Homewood Limited
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London
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Audit Sheet

Rev.	Description	Prepared and checked by	Reviewed by	Date
A	First Issue	LB	JC/GC	14.10.14
B	Updated to reflect design team comment	LB	JC	20.10.14

Contents

Executive Summary

Cooper Homewood (CH) have been appointed by Little Venice Developments ("Client") to undertake the design of the Mechanical, Electrical and Public Health (MEP) Services with an overseeing role during the site works to ensure the MEP installation proceeds in line with the design intent. It is CH's responsibility to develop the energy strategy for the development and implement the use of low/zero carbon (LZC) technologies in line with the recommendations set out in the Syntegra Consulting Energy Strategy Report dated 14th November 2013 submitted with the planning application and referred to in the London Borough of Camden's Section 106 agreement. This report identifies inconsistencies with the Syntegra Consulting Energy Strategy Report and demonstrates how these issues have been addressed during the detailed development of the energy strategy.

This report has been prepared to document the data used to inform the Part L1A 2013 assessment for the new residential development at 2 Britannia Street, London. The assessment has been carried out using Elmhurst Energy Design SAP software 2012 to demonstrate the suitability of the proposed passive design measures and to determine the requirement for renewable technologies in line with the previously submitted Energy Strategy Report.

This assessment has demonstrated that the reduction in carbon emission set out in the Syntegra Energy Strategy submitted for planning is achievable through the implementation of the following strategy:

- 'Be Lean' measures; enhanced passive design measures such as improved U values and air tightness.
- 'Be Clean' measures; including highly efficient engineering services such as gas condensing boilers, whole house ventilation with heat recovery and low energy lighting.
- 'Be Green' measures, the incorporation of a complimentary renewable energy source via roof mounted photovoltaic panels.

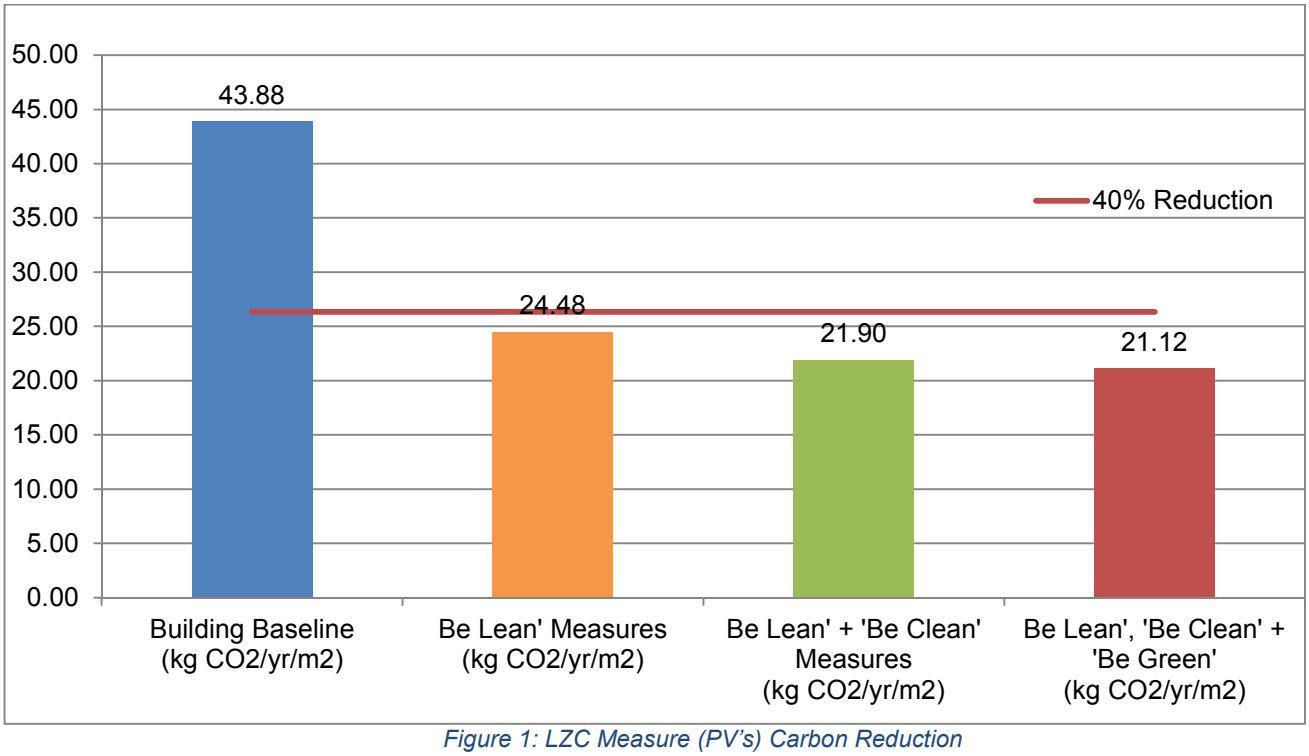

Figure 1: LZC Measure (PV's) Carbon Reduction

Figure 1 illustrates a CO_2 reduction of more than 40% from the original Baseline development and therefore complies with the London Borough of Camden's requirements as set out in the Section 106 agreement.

The report has identified a number of inconsistencies with the Syntegra Consulting Energy Strategy Report submitted for planning, which can be summarised as follows:

- The existing Baseline building emissions as calculated by CH is estimated to be higher than the emissions predicted by Syntegra.
- The CO_2 emissions reductions as a result of 'Be Lean' passive design measures are estimated to be higher than Syntegra have estimated.
- The stated peak PV power of 7.85kW is not achievable with 6.52m^2 of roof area and it has been determined that 38m^2 would be required, which is not considered to be feasible. It is therefore proposed to provide the 6.5m^2 of PV array, which provides a reduced peak output of 1.31kW.
- Taking into consideration these inconsistencies and through the use of approved SAP software it is still predicted that the buildings CO_2 emissions will be reduced by at least 40% as per the original intent.

1.0 Introduction

Cooper Homewood (CH) have been appointed by Little Venice Developments ("Client") to undertake the design of the Mechanical, Electrical and Public Health Engineering Services with an overseeing role during the site works to ensure the installation proceeds in line with the design intent. It is CH's responsibility to develop the energy strategy for the development and implement the use of low/zero carbon (LZC) technologies in line with the recommendations set out in the Syntegra Consulting Energy Strategy Report dated 14th November 2013 submitted with the planning application and referred to in the London Borough of Camden's Section 106 agreement.

This report has been prepared to document the data used to inform the Part L1A 2013 assessment for the new residential development at 2 Britannia Street, London.

The preliminary Part L assessment informs the main part of the energy strategy and determines the extent of the CO_2 emissions reductions for the development. The assessments have been carried out using Elmhurst Energy Design SAP software 2012 to demonstrate the suitability of the proposed passive design measures and to determine the requirement for renewable technologies in line with the previously submitted Energy Strategy Report.

The report addresses carbon reduction measures only and does not develop further on the BREEAM Domestic Refurbishment requirements, which will be developed in line with the Energy Strategy submitted for planning by the respective members of the design team.

This report identifies inconsistencies with the Syntegra Consulting Energy Strategy Report and demonstrates how these issues have been addressed during the detailed development of the energy strategy.

Ω End of Section

2.0 Planning Agreement

The London Borough of Camden's section 106 agreement dated 6th October 2014 identifies the requirements for demonstrating that the development carbon emissions will target a minimum 40% reduction from the existing development using a combination of complimentary low and zero carbon technologies in line with the Syntegra Consulting Energy Strategy Report.

During the detailed development of the energy strategy a number of inconstancies have been found with the previously submitted Syntegra report, which are summarised as follows:

- The report proposes 7.85kW of peak photovoltaic (PV) power as part of the 'Be Green' measures. The report states that this is to be provided by 24 No. panels, which equates to 6.52m^2 of total required roof area. 7.85kWp actually equates to 38m^2 of PV panels, which is not feasible for the following reasons:
  - Access is required around the PV panels for maintenance purposes and space is required for roof terminations for soil vent pipes. Therefore even with both flat roof sections being covered the stated 38m^2 of roof area is not achievable.
  - The site is located in a conservation area and therefore it is the Client's intension to limit the visible impact of the PV panels.

- In order to demonstrate the extent of the CO_2 reductions as a result of enhanced passive design measures and low/zero carbon technologies the existing building Baseline emissions must be calculated. The Syntegra report identities the standard case minimum space and water heating services as well as the existing envelope specification. CH have taken the same input data and entered this into an approved SAP calculation software package (Elmhurst Energy Design SAP software) but have determined higher emission rates for the Baseline building, which is illustrated in figure 2:

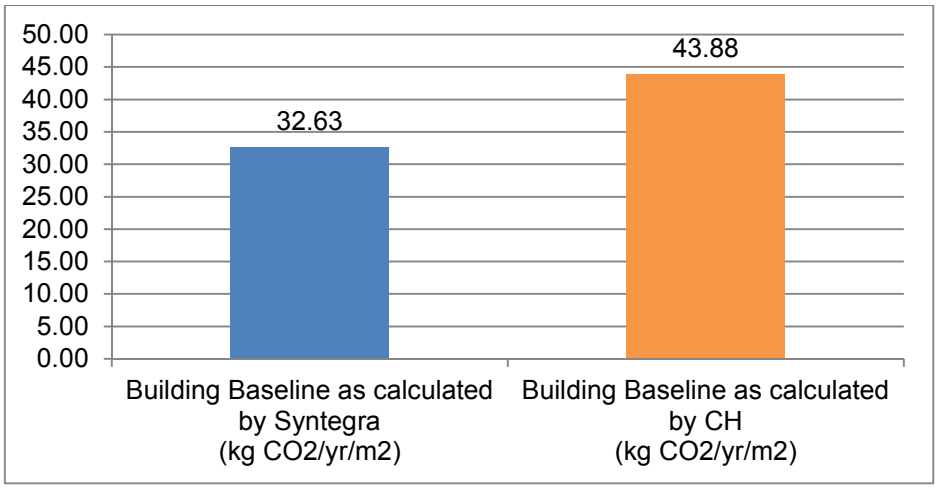

Figure 2: Baseline Emissions Comparison

- The Syntegra report identifies the CO_2 emissions reductions as a result of passive design measures, which include enhanced U values and air permeability. CH have used the same data and found that the emissions rate is lower than the figure estimated by Syntegra as illustrated in figure 3:

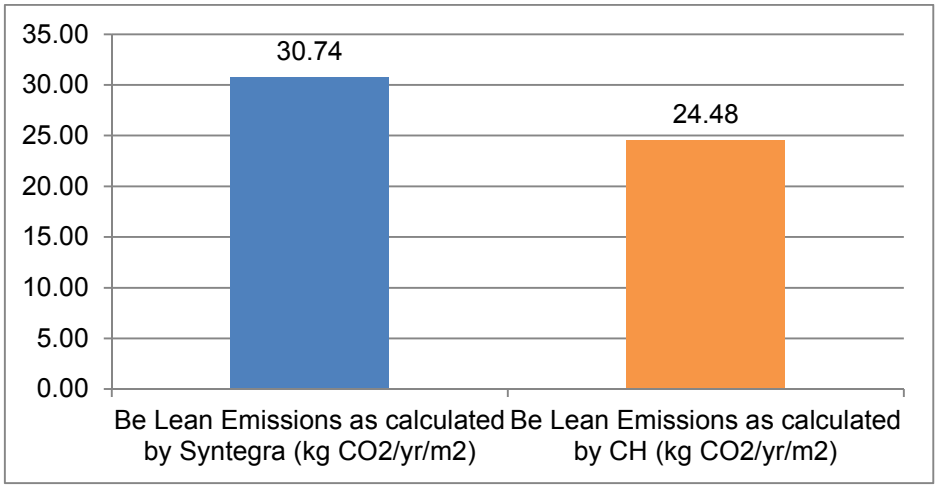

Figure 3: 'Be Lean' Emissions Comparison

Ω End of Section

3.0 Existing Baseline Building

This section details the information used to define the existing building carbon emissions. The purpose of this exercise is to establish the 'Baseline' carbon emissions for the development to enable the new passive and LZC technologies to be assessed. The data used is extracted from the Syntegra Energy Strategy Report submitted for planning.

3.1 Existing Fabric Details

The following construction details have been used in CH's baseline SAP calculations.

Passive Item	Values
External Wall U-Value	0.56 W/m^{2}K
Roof U-Value	0.16 W/m^{2}K
Ground Floor U-Value	1.6 W/m^{2}K
Front Door U-Value	2.0 W/m^{2}K
Windows U-value	4.8 W/m^{2}K
Glazing Type	Single glazed with a wooden frame
Thermal Bridging (Y Value)	0.15 Default within SAP 2012
Air Permeability	15 m3/h.m2 at 50 Pa

3.2 Existing Services Details

The following services details have been used in CH's baseline SAP calculations.

Services Item	Values
Main Heating Fuel:	Mains gas
Main Heating System:	Boilers and radiator
Boiler	SEDBUK (2009) 88% efficient. On/off burner control
Heating System Controls:	Programmer, room thermostat, TVRs, boiler interlock
Hot Water System:	Stored hot water, heated by boiler only. Separate time control for space and water heating
Hot Water Storage:	150 Litre cylinder insulted with 35mm of factory applied foam.
Primary water heating losses:	Primary pipework insulted, cylinder temperature controlled by thermostat.
% Low Energy Light Fittings:	0
LZC Technologies:	None

3.3 Baseline Carbon Emissions

Based upon the above data the existing carbon emissions for the development is as follows;

Overall: 43.88 kgCO_2/yr/m^2

Full calculations for the base case devlopment are provided in the appendices of this report. A summary of anticipated energy usage and carbon emissions is as follows:

Services	Existing Building Energy Use (kWh/m^2/yr)	Existing Building CO_2 Emissions (kgCO_2/yr/m^2)
Heating:	148.92	32.17
Hot Water:	29.12	6.29
Lighting:	1.80	0.94
Auxiliary:	8.64	4.49
Total:	**188.49**	**43.88**

Ω End of Section

4.0 Proposed Passive Design Measures (Be Lean)

The following improved passive design measures are as per the stated measures detailed within Syntegra Energy Strategy under 'Be Lean' measures:

Passive Item	Values	Notes
External Wall U Value	0.2 W/m²K	Enhanced to meet Syntegra requirements.
External Wall (Extension)	0.25 W/m²K	Stated within Syntegra Report.
External Roof U Value	0.16 W/m²K	Same as existing value stated within the report.
Ground Floor U-Value	0.2 W/m²K	Enhanced to meet Syntegra requirements.
Front Door U Value	2.0 W/m²K	Based upon Part L.
Windows U value	1.4 W/m²K	Secondary glazing to be applied on all existing single glazed windows.
Secondary and New Glazing Type	Double glazed	As stated within Syntegra report.
Thermal Bridging (Y Value)	0.15	Default within SAP 2012.
Air Permeability	11 m3/h.m2 at 50 Pa	Enhanced air permeability from existing.

4.1 Be Lean Carbon Emission Reductions

Figure 4 illustrates the Baseline CO_2 emissions for the development and compares this against the 'Be Lean' scheme which incorporates improved passive design measures. It can be seen that through enhanced fabric details the proposed building CO_2 emissions are reduced by more than 40%.

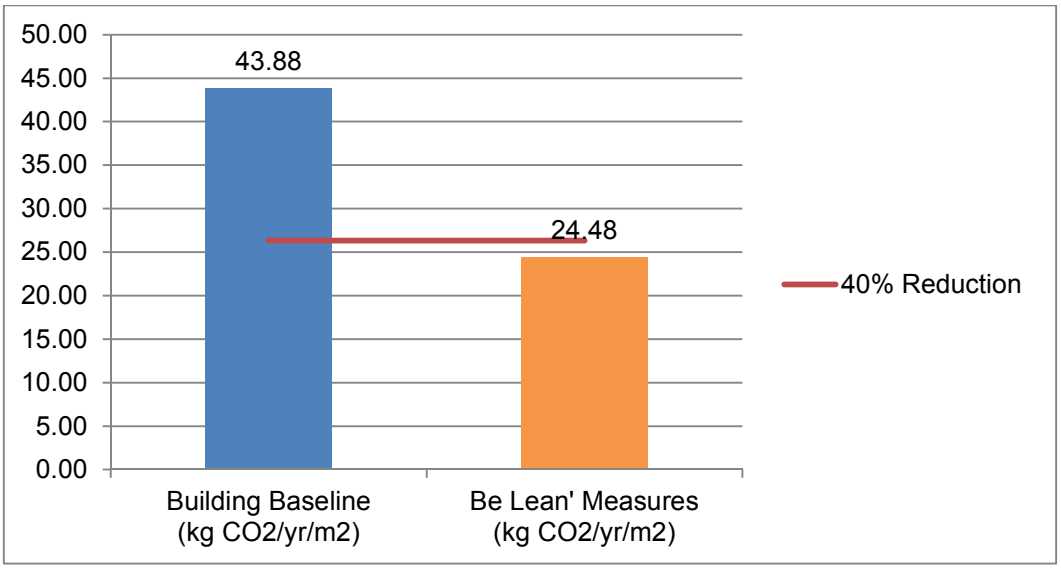

Figure 4: Be Lean Carbon Emission Reduction

Ω End of Section

5.0 Energy Efficient Measures (Be Clean)

The following services details (stated within Syntegra Energy Strategy under 'Be Clean' measures) have been modelled and consider the use of highly efficient lighting, boilers, hot water storage, ventilation and controls:

Items	Values	Notes
Boiler	91%	91% is the highest efficiency on the SEDBUK database for gas condensing boilers.
Hot Water Storage	Cylinder insulation increased to 80mm	
Ventilation Specific Fan Power	0.8	This is based on a small residential type MVHR unit.
Ventilation Heat Recovery Efficiency	90%	
% Low Energy Light Fittings	100	As stated within Syntegra report.

5.1 Be Lean Carbon Emission Reductions

Figure 5 shows the Baseline carbon emissions and the reductions as a result of the 'Be Lean' and 'Be Clean' measures. It can been seen through enhancing these systems the overall carbon emission figure for the development reduces by a further 6%, a 50% improvement over the Baseline figure.

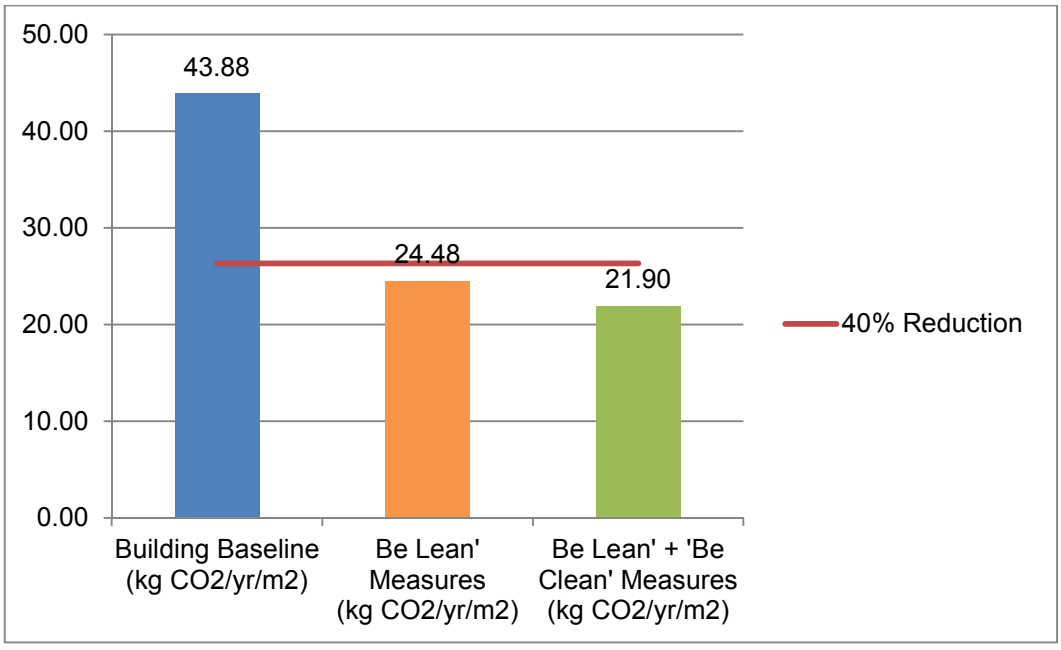

Figure 5: Be Clean Carbon Emission Reduction

Ω End of Section

6.0 Be Green Technologies (Photovoltaic Panels)

It is proposed to introduce renewable technologies to further reduce the overall carbon emission levels of the development. This will be achieved by using photovoltaic (PV) panels on the roof. The proposal is to use 6.5m^2 of PV panels on the main buildings new roof. This equates to four panels with a peak load of 1.308kW.

Figure 6 shows the reduction in carbon emissions through 'Be lean' and 'Be Clean' measures with further improvement with the inclusion of 6.5m^2 PV panels. It can be seen through the use of PV panels the total carbon emission rate is reduced by 51% from the Baseline development.

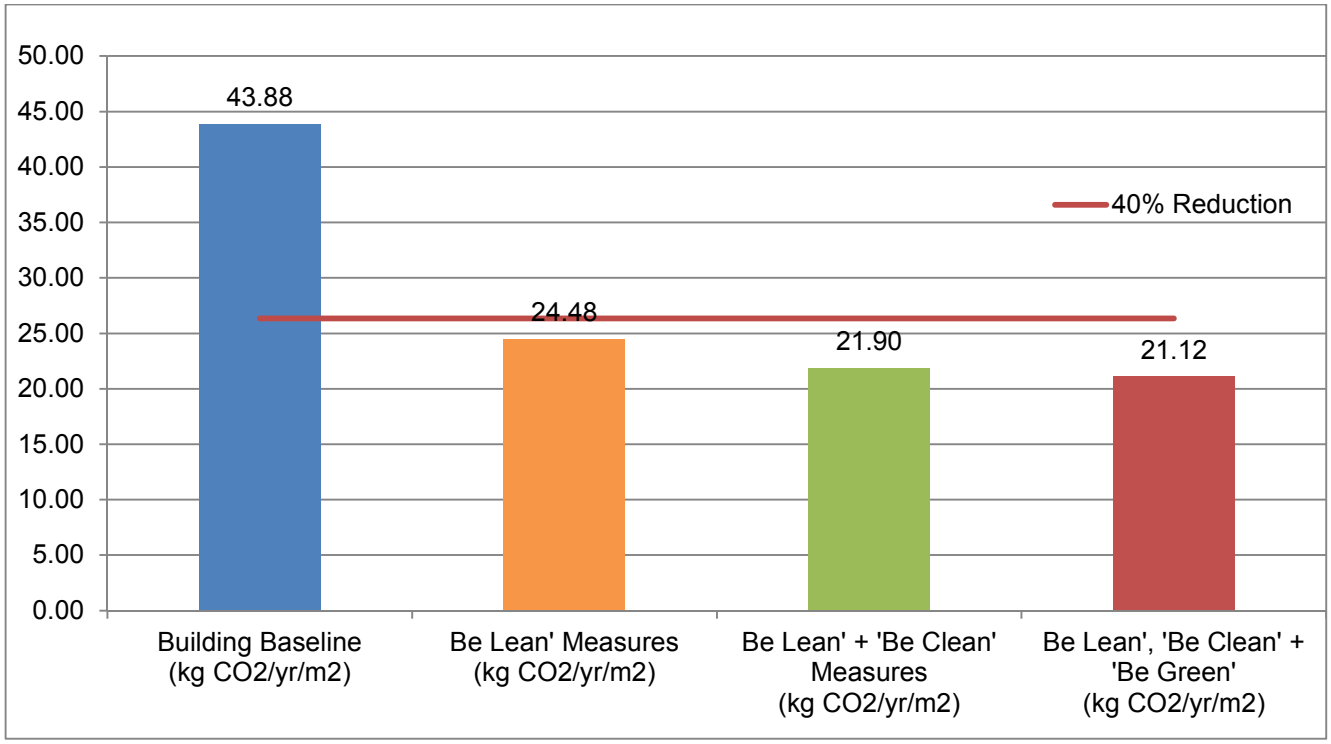

Figure 6: LZC Measure (PV's) Carbon Reduction

Ω End of Section

7.0 Conclusion

This assessment has demonstrated that the 40% reduction in carbon emissions as requested by The London Borough of Camden is achievable through the implementation of the following strategy:

- 'Be Lean' measures; enhanced passive design measures such as improved U values and air tightness.
- 'Be Clean' measures; including highly efficient engineering services such as gas condensing boilers, whole house ventilation with heat recovery and low energy lighting.
- 'Be Green' measures, the incorporation of a complimentary renewable energy source via roof mounted photovoltaic panels.

The report has identified the inconsistencies with the Syntegra report submitted for planning, which can be summarised as follows:

- The existing Baseline building emissions as calculated by CH is estimated to be higher than the emissions predicted by Syntegra.
- The CO_2 emissions reductions as a result of 'Be Lean' passive design measures are estimated to be higher than Syntegra have estimated.
- The peak PV power of 7.85kW is not achievable with 6.52m^2 of roof area and it has been determined that 38m^2 would be required, which is not considered to be feasible. It is therefore proposed to provide the 6.5m^2 of PV array, which provides a reduced peak output of 1.31kW.
- Taking into consideration these inconsistencies and through the use of approved SAP software it is still predicted that the buildings CO_2 emissions will be reduced by at least 40% as per the original intent.

Ω End of Section

Appendix A – Preliminary 'As Designed' SAP Calculations

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

Summary Information

Property Reference: Apartment 1 **Issued on Date:** 14.Oct.2014
Survey Reference: Be Green Assessment **Prop Type Ref:** Flat
Property: Britannia Street, Kings Cross, London, WC1X 9EJ

SAP Rating: 80 C **CO2 Emissions (t/year):** 2.15 **DER:** 21.99 Fail **TER:** 15.89 **Percentage DER<TER:** -38.40 %
Environmental: 80 C **General Requirements Compliance:** Fail **DFEE:** 72.20 Fail **TFEE:** 52.20 **Percentage DFEE<TFEE:** -38.30 %

CfSH Results **Version:** **ENE1 Credits:** N/A **ENE2 Credits:** N/A **ENE7 Credits:** N/A **CfSH Level:** N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	South
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	3
3.0 Date Built	2014
3.0 Property Age Band	
4.0 Sheltered Sides	4
5.0 Sunlight/Shade	More than average

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Basement:	18.60	59.30	2.80
1st Storey:	14.95	33.80	3.60
2nd Storey:	12.30	38.74	3.00

7.0 Living Area 36.00

8.0 Thermal Mass Parameter Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Wall	Other	0.20		61.67	48.29
Extension Wall	Other	0.25		81.13	81.13

9.1 Party walls

Description	Construction	Kappa	Area
Party Wall	Other		99.00

10.1 Party Ceilings

Description	Construction	Kappa	Area
Party Ceilings	Concrete floor slab, carpeted		38.74

11.0 HeatLoss Floors

Description	Construction	U-Value	Kappa	Area
Heat Loss Floor	Suspended concrete floor, carpeted	0.20		59.30

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Front Door	Manufacturer	Solid Door							2.00
New Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
South Glazing New	Window	[1] External Wall	South	None	0.00					8.32	
Front Door	Solid Door	[1] External Wall	South							1.80	
Glazing	Window	[1] External Wall	South	None	0.00					3.26	

14.0 Conservatory None

15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.150
Description	
18.0 Pressure Testing	Yes
Designed q50	11.00
Property Tested ?	
As Built q50	
Same As Designed ?	
19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows half open
Cross ventilation possible	No
Night Ventilation	Yes
Air change rate	2.50
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	5
Brand, Model	TBC

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 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	12
Total number of L.E.L. fittings	12
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Gas Fired Boiler
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Sedbuk 2009) %	91.0
Efficiency (Sedbuk 2009) %	
In Winter	
In Summer	
Model Name	TBC

Manufacturer	TBC
Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	

27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	

28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	

31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	

Pump electrically powered
Combined Cylinder

32.0 Thermal Store: None
Thermal Store Pipework

33.0 Photovoltaic Unit: One Dwelling
Apportioned KWh/Year

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines
Terrain Type: Urban
Wind Turbines
Count
Apportioned Kwh/year
Rotor Diameter
Hub Height

35.0 Small-scale Hydro
Electricity Generated
Description
Apportioned kWh/Year

Recommendations
None

Further measures to achieve even higher standards
None

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

Summary Information

Property Reference: Apartment 2
Survey Reference: Be Green Assessment
Property: Britannia Street, Kings Cross, London, WC1X 9EJ

Issued on Date: 14.Oct.2014
Prop Type Ref: Flat

SAP Rating: 82 B **CO2 Emissions (t/year):** 2.10 **DER:** 20.09 Fail **TER:** 14.90 **Percentage DER<TER:** -34.83 %
Environmental: 82 B **General Requirements Compliance:** Fail **DFEE:** 65.65 Fail **TFEE:** 49.02 **Percentage DFEE<TFEE:** -33.93 %

CfSH Results **Version:** **ENE1 Credits:** N/A **ENE2 Credits:** N/A **ENE7 Credits:** N/A **CfSH Level:** N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	South
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2014
3.0 Property Age Band	
4.0 Sheltered Sides	4
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Basement:	19.50	74.69	3.00
1st Storey:	10.81	67.74	3.20

7.0 Living Area	54.13
8.0 Thermal Mass Parameter	Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Wall	Other	0.20		93.09	78.78

9.1 Party walls

Description	Construction	Kappa	Area
Existing Party Wall	Other		162.69

10.1 Party Ceilings

Description	Construction	Kappa	Area
Existing Party Ceilings	Concrete floor slab, carpeted		67.74

11.0 HeatLoss Floors

Description	Construction	U-Value	Kappa	Area
Heat Loss Floor	Suspended concrete floor, carpeted	0.20		74.69

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Front Door	Manufacturer	Solid Door							2.00
Existing Glazing	SAP table	Window	Single glazed				Wood		4.80
New Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
Front Door	Solid Door	[1] External Wall	South							2.34	
North East Glazing	Window	[1] External Wall	North East	None	0.00					8.41	
South Glazing	Window	[1] External Wall	South	None	0.00					3.56	

14.0 Conservatory	None

15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.150
Description	
18.0 Pressure Testing	Yes
Designed q50	11.00
Property Tested ?	
As Built q50	
Same As Designed ?	
19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows half open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	4.00
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	5
Brand, Model	TBC

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 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	14
Total number of L.E.L. fittings	14
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Boilers
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Sedbuk 2009) %	91.0
Efficiency (Sedbuk 2009) %	
In Winter	
In Summer	
Model Name	TBC

Manufacturer	TBC
Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	

27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	

28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	

31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	

Pump electrically powered
Combined Cylinder

32.0 Thermal Store: None
Thermal Store Pipework

33.0 Photovoltaic Unit: One Dwelling
Apportioned KWh/Year

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines
Terrain Type: Urban
Wind Turbines
Count
Apportioned Kwh/year
Rotor Diameter
Hub Height

35.0 Small-scale Hydro
Electricity Generated
Description
Apportioned kWh/Year

Recommendations
None

Further measures to achieve even higher standards
None

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

Summary Information

Property Reference: Apartment 3 **Issued on Date:** 14.Oct.2014
Survey Reference: Be Green Assessment **Prop Type Ref:** Flat
Property: Britannia Street, Kings Cross, London, WC1X 9EJ

SAP Rating: 79 C **CO2 Emissions (t/year):** 1.72 **DER:** 25.46 Fail **TER:** 18.51 **Percentage DER<TER:** -37.56 %
Environmental: 79 C **General Requirements Compliance:** Fail **DFEE:** 77.41 Fail **TFEE:** 58.13 **Percentage DFEE<TFEE:** -33.17 %

CfSH Results **Version:** **ENE1 Credits:** N/A **ENE2 Credits:** N/A **ENE7 Credits:** N/A **CfSH Level:** N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	North East
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2014
3.0 Property Age Band	
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Basement:	21.53	48.45	3.00
1st Storey:	17.59	41.77	3.20

7.0 Living Area	38.54
8.0 Thermal Mass Parameter	Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Wall	Other	0.20		120.88	97.12

9.1 Party walls

Description	Construction	Kappa	Area
Existing Party Wall	Other		59.45

10.1 Party Ceilings

Description	Construction	Kappa	Area
Existing Party Ceilings	Concrete floor slab, carpeted		41.77

11.0 HeatLoss Floors

Description	Construction	U-Value	Kappa	Area
Heat Loss Floor	Suspended concrete floor, carpeted	0.20		48.45

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Front Door	Manufacturer	Solid Door							2.00
Double Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
Front Door	Solid Door	[1] External Wall	North East							2.53	
North East Existing	Window	[1] External Wall	North East	None	0.00					8.18	
South Existing	Window	[1] External Wall	South	None	0.00					5.92	
East Existing	Window	[1] External Wall	East	None	0.00					7.13	

14.0 Conservatory	None
15.0 Draught Proofing	100

16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.150
Description	
18.0 Pressure Testing	Yes
Designed q50	11.00
Property Tested ?	
As Built q50	
Same As Designed ?	
19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows half open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	4.00
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	4
Brand, Model	TBC

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 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	12
Total number of L.E.L. fittings	12
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Gas Fired Boilers
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Sedbuk 2009) %	91.0
Efficiency (Sedbuk 2009) %	
In Winter	
In Summer	
Model Name	TBC
Manufacturer	TBC

Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	

27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	

28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	

31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	
Pump electrically powered	

Combined Cylinder

32.0 Thermal Store: None
Thermal Store Pipework

33.0 Photovoltaic Unit: One Dwelling
Apportioned KWh/Year

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines
Terrain Type: Urban
Wind Turbines
Count
Apportioned Kwh/year
Rotor Diameter
Hub Height

35.0 Small-scale Hydro
Electricity Generated
Description
Apportioned kWh/Year

Recommendations
None

Further measures to achieve even higher standards
None

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

Summary Information

Property Reference: Apartment 4 **Issued on Date:** 14.Oct.2014
Survey Reference: Be Green Assessment **Prop Type Ref:** Flat

Property: 2, Britannia Street, Kings Cross, London, WC1X 9EJ

SAP Rating: 84 B **CO2 Emissions (t/year):** 0.70 **DER:** 17.66 Fail **TER:** 16.46 **Percentage DER<TER:** -7.26 %
Environmental: 89 B **General Requirements Compliance:** Fail **DFEE:** 42.43 Fail **TFEE:** 31.46 **Percentage DFEE<TFEE:** -34.88 %

CfSH Results **Version:** **ENE1 Credits:** N/A **ENE2 Credits:** N/A **ENE7 Credits:** N/A **CfSH Level:** N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	North East
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2014
3.0 Property Age Band	
4.0 Sheltered Sides	4
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	9.80	51.72	3.20

7.0 Living Area	32.22
8.0 Thermal Mass Parameter	Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
Existing Wall	Other	0.20		31.36	25.31

9.1 Party walls

Description	Construction	Kappa	Area
Party Wall 1	Other		79.33

10.1 Party Ceilings

Description	Construction	Kappa	Area
Party Ceilings	Concrete floor slab, carpeted		51.72

11.1 Party Floors

Description	Construction	Kappa	Area
Party Floor	Concrete floor slab, carpeted		51.72

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
New Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
South Glazing	Window	[1] Existing Wall	South	None	0.00					6.05	

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.150
Description	
18.0 Pressure Testing	Yes
Designed q50	11.00
Property Tested ?	

As Built q50	
Same As Designed ?	

19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows fully open
Cross ventilation possible	No
Night Ventilation	Yes
Air change rate	4.00
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	2
Brand, Model	TBC

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 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	7
Total number of L.E.L. fittings	7
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Gas Fired Boiler
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Manufacturer) %	91.0
Efficiency (Manufacturer) %	
In Winter	
In Summer	
Model Name	TBC
Manufacturer	TBC
Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	

Oil Pump Inside	
FI Case	
FI Water	
Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	

27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	

28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	

31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	
Pump electrically powered	
Combined Cylinder	

32.0 Thermal Store	None
Thermal Store Pipework	
33.0 Photovoltaic Unit	One Dwelling
Apportioned KWh/Year	

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines

Terrain Type	Urban
Wind Turbines	
Count	
Apportioned Kwh/year	
Rotor Diameter	
Hub Height	

35.0 Small-scale Hydro

Electricity Generated	
Description	
Apportioned kWh/Year	

Recommendations

None

Further measures to achieve even higher standards

None

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

COOPERHOMEWOOD
ENGINEERING CONSULTANCY

Summary Information

Property Reference: Apartment 5 **Issued on Date:** 14.Oct.2014
Survey Reference: Be Green Assessment **Prop Type Ref:** Flat
Property: Britannia Street, Kings Cross, London, WC1X 9EJ

SAP Rating:	81 B	**CO2 Emissions (t/year):**	1.01	**DER:**	22.37 Fail	**TER:**	18.27	**Percentage DER<TER:**	-22.47 %
Environmental:	85 B	**General Requirements Compliance:**	Fail	**DFEE:**	57.67 Fail	**TFEE:**	46.28	**Percentage DFEE<TFEE:**	-24.61 %

CfSH Results **Version:** **ENE1 Credits:** N/A **ENE2 Credits:** N/A **ENE7 Credits:** N/A **CfSH Level:** N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	West
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2014
3.0 Property Age Band	
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:	19.90	59.47	3.20

7.0 Living Area 33.12

8.0 Thermal Mass Parameter Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Wall	Other	0.20		63.68	48.23

10.1 Party Ceilings

Description	Construction	Kappa	Area
Existing Party Ceilings	Concrete floor slab, carpeted		59.47

11.1 Party Floors

Description	Construction	Kappa	Area
Existing Party Floor	Concrete floor slab, carpeted		59.47

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Double Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
South Existing	Window	[1] External Wall	South	None	0.00					5.82	
East Existing	Window	[1] External Wall	East	None	0.00					2.21	
North East	Window	[1] External Wall	North East	None	0.00					7.42	

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.150
Description	
18.0 Pressure Testing	Yes
Designed q50	11.00
Property Tested ?	
As Built q50	
Same As Designed ?	

19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	2
Brand, Model	TBC

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 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	6
Total number of L.E.L. fittings	6
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	10 Hour Off Peak
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Gas Fired Boiler
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Sedbuk 2009) %	91.0
Efficiency (Sedbuk 2009) %	
In Winter	
In Summer	
Model Name	TBC
Manufacturer	TBC
Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	

Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	
29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	
31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	
Pump electrically powered	
Combined Cylinder	
32.0 Thermal Store	None
Thermal Store Pipework	
33.0 Photovoltaic Unit	One Dwelling
Apportioned KWh/Year	

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines

Terrain Type	Urban
Wind Turbines	
Count	
Apportioned Kwh/year	
Rotor Diameter	
Hub Height	

35.0 Small-scale Hydro

Electricity Generated	
Description	
Apportioned kWh/Year	

Recommendations

None

Further measures to achieve even higher standards

None

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

Summary Information

Property Reference: Apartment 6
Survey Reference: Be Green Assessment
Property: Britannia Street, Kings Cross, London, WC1X 9EJ

Issued on Date: 14.Oct.2014
Prop Type Ref: Flat

SAP Rating:	84 B	**CO2 Emissions (t/year):**	1.21	**DER:**	17.87 Fail	**TER:**	12.79	**Percentage DER<TER:**	-39.73 %
Environmental:	86 B	**General Requirements Compliance:**	Fail	**DFEE:**	48.15 Fail	**TFEE:**	29.13	**Percentage DFEE<TFEE:**	-65.28 %

CfSH Results	**Version:**	**ENE1 Credits:**	N/A	**ENE2 Credits:**	N/A	**ENE7 Credits:**	N/A	**CfSH Level:**	N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	North
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2014
3.0 Property Age Band	
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	22.55	91.88	2.45

7.0 Living Area	36.54
8.0 Thermal Mass Parameter	Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Wall	Other	0.20		24.67	7.39
New Extension Wall	Other	0.25		30.58	30.58

9.1 Party walls

Description	Construction	Kappa	Area
Existing Party Wall	Other		45.94

10.0 External Roofs

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Roof	Other	0.16		36.54	36.54

10.1 Party Ceilings

Description	Construction	Kappa	Area
Existing Party Ceilings	Concrete floor slab, carpeted		55.34

11.1 Party Floors

Description	Construction	Kappa	Area
Existing Party Floor	Concrete floor slab, carpeted		91.88

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
New Glazing	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.40
Double Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
South New Glazing	Window	[1] External Wall	South	None	0.00					12.10	

Existing Glazing	Window	[1] External Wall	South	None	0.00	5.18

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.150
Description	
18.0 Pressure Testing	No
Designed q50	15.00
Property Tested ?	
As Built q50	
Same As Designed ?	
19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows fully open
Cross ventilation possible	No
Night Ventilation	Yes
Air change rate	4.00
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	3
Brand, Model	TBC

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 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	10
Total number of L.E.L. fittings	10
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Gas Fired Boilers
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102

Efficiency (Sedbuk 2009) %	91.0
Efficiency (Sedbuk 2009) %	
In Winter	
In Summer	
Model Name	TBC
Manufacturer	TBC
Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	

27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	

28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	

31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	

n0, a1, a2, A/G ratio
Orientation
Elevation
Overshading
Solar Storage Volume
Pump electrically powered
Combined Cylinder

32.0 Thermal Store — None
Thermal Store Pipework
33.0 Photovoltaic Unit — One Dwelling
Apportioned KWh/Year

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines
Terrain Type — Urban
Wind Turbines
Count
Apportioned Kwh/year
Rotor Diameter
Hub Height
35.0 Small-scale Hydro
Electricity Generated
Description
Apportioned kWh/Year

Recommendations
None

Further measures to achieve even higher standards
None

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

Summary Information

Property Reference: Apartment 7 **Issued on Date:** 14.Oct.2014
Survey Reference: Be Green Assessment **Prop Type Ref:** Flat
Property: Britannia Street, Kings Cross, London, WC1X 9EJ

SAP Rating: 84 B **CO2 Emissions (t/year):** 0.86 **DER:** 18.14 Fail **TER:** 15.52 **Percentage DER<TER:** -16.85 %
Environmental: 88 B **General Requirements Compliance:** Fail **DFEE:** 41.74 Fail **TFEE:** 32.44 **Percentage DFEE<TFEE:** -28.65 %

CfSH Results **Version:** **ENE1 Credits:** N/A **ENE2 Credits:** N/A **ENE7 Credits:** N/A **CfSH Level:** N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	West
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2014
3.0 Property Age Band	
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:	19.87	61.94	2.45

7.0 Living Area 33.20

8.0 Thermal Mass Parameter Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
New External Wall	Other	0.20		48.68	37.24

9.1 Party walls

Description	Construction	Kappa	Area
Party Wall 1	Other		33.40

10.1 Party Ceilings

Description	Construction	Kappa	Area
Existing Party Ceilings	Concrete floor slab, carpeted		61.94

11.1 Party Floors

Description	Construction	Kappa	Area
Existing Party Floor	Concrete floor slab, carpeted		61.94

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
New Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
South Glazing	Window	[1] New External Wall	South	None	0.00					3.42	
East Glazing	Window	[1] New External Wall	East	None	0.00					1.60	
North East Glazing	Window	[1] New External Wall	North East	None	0.00					6.42	

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default

Y-value	0.150
Description	
18.0 Pressure Testing	Yes
Designed q50	11.00
Property Tested ?	
As Built q50	
Same As Designed ?	

19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	2
Brand, Model	TBC

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 Cooling System	No

22.0 Lighting	
Internal	
Total number of light fittings	10
Total number of L.E.L. fittings	10
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard

24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Gas Fired Boiler
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No

25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Sedbuk 2009) %	91.0
Efficiency (Sedbuk 2009) %	
In Winter	
In Summer	
Model Name	TBC
Manufacturer	TBC
Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0

Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	

27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	

28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	

31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	
Pump electrically powered	
Combined Cylinder	

32.0 Thermal Store	None

Thermal Store Pipework

33.0 Photovoltaic Unit — One Dwelling

Apportioned KWh/Year

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines

Terrain Type — Urban

Wind Turbines Count

Apportioned Kwh/year

Rotor Diameter

Hub Height

35.0 Small-scale Hydro

Electricity Generated

Description

Apportioned kWh/Year

Recommendations

None

Further measures to achieve even higher standards

None

Cooper Homewood Ltd
7-9 Mill Court
The Sawmills
Southampton
SO32 2EJ

Summary Information

Property Reference: Apartment 8 **Issued on Date:** 14.Oct.2014
Survey Reference: Be Green Assessment **Prop Type Ref:** Flat
Property: Britannia Street, Kings Cross, London, WC1X 9EJ

SAP Rating: 80 C **CO2 Emissions (t/year):** 1.74 **DER:** 23.34 Fail **TER:** 16.78 **Percentage DER<TER:** -39.07 %
Environmental: 80 C **General Requirements Compliance:** Fail **DFEE:** 66.78 Fail **TFEE:** 48.92 **Percentage DFEE<TFEE:** -36.52 %

CfSH Results **Version:** **ENE1 Credits:** N/A **ENE2 Credits:** N/A **ENE7 Credits:** N/A **CfSH Level:** N/A

Surveyor: admin Admin (Unaccredited), Tel: 4, Fax: s@l.f Surveyor ID: Admin
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r06
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	North
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2014
3.0 Property Age Band	
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:	21.91	101.95	3.00

7.0 Living Area	39.30
8.0 Thermal Mass Parameter	Simple calculation - High

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
New External Wall	Other	0.20		65.73	54.75

9.1 Party walls

Description	Construction	Kappa	Area
Existing Party Wall	Other		23.34

10.0 External Roofs

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
Existing External Roof	Other	0.16		101.95	101.95

11.1 Party Floors

Description	Construction	Kappa	Area
Existing Party Floor	Concrete floor slab, carpeted		101.95

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
New Glazing	Manufacturer	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	Height	Count	Area	Curtain Closed
North East	Window	[1] New External Wall	North East	None	0.00					4.32	
East	Window	[1] New External Wall	East	None	0.00					1.26	
South	Window	[1] New External Wall	South	None	0.00					5.40	

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default

Y-value	0.150
Description	
18.0 Pressure Testing	Yes
Designed q50	11.00
Property Tested ?	
As Built q50	
Same As Designed ?	

19.0 Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	6.00
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	
Configuration	
MVHR Duct Insulated	Yes
Manufacturer SFP	0.80
Duct Type	Semi rigid
MVHR Efficiency	90.00
Wet Rooms	3
Brand, Model	TBC

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 Cooling System	No

22.0 Lighting	
Internal	
Total number of light fittings	12
Total number of L.E.L. fittings	12
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard

24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	Gas Fired Boiler
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage System	No
Solar Panel	No

25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Sedbuk 2009) %	91.0
Efficiency (Sedbuk 2009) %	
In Winter	
In Summer	
Model Name	TBC
Manufacturer	TBC
Controls	CBE Programmer, room thermostat and TRVs
PCDF Controls	0

Delayed Start Stat	Yes
Sap Code	2106
Burner Control	On/Off
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	None or Unknown
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	

27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	

28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heating 1
Water use <= 125 litres/person/day	Yes
SAP Code	901
Immersion Heater	
Summer Immersion	
Suplementary Immersion	
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
Details	
29.2 Waste Water Heat Recovery System	
Total rooms with shower and/or bath	
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	
Cylinder Volume	150.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	

31.0 Solar Panel	
Solar Panel Area	
Area Type	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	
Pump electrically powered	
Combined Cylinder	

32.0 Thermal Store	None

Thermal Store Pipework

33.0 Photovoltaic Unit — One Dwelling

Apportioned KWh/Year

PV Cells kW Peak	Orientation	Elevation	Overshading
0.16	South	30°	None Or Little

34.0 Wind Turbines

Terrain Type — Urban

Wind Turbines Count

Apportioned Kwh/year

Rotor Diameter

Hub Height

35.0 Small-scale Hydro

Electricity Generated

Description

Apportioned kWh/Year

Recommendations

None

Further measures to achieve even higher standards

None