

59 Maresfield Gardens London NW3 5TE

SAP Assessment Report

Mechanical, Electrical and Public Health Engineering Services

5145/01/06/SAR Rev D

info@cooperhomewood.com

cooperhomewood.com

Fareham Office

1600 Parkway Solent Business Park Whiteley, Fareham P015 7AH

T: 01489 346 700

London Office

The Foundry Business Centre 156 Blackfriars Road Southwark, London SE1 8EN

T: 02071 990 359

59 Maresfield Gardens, London

SAP Assessment Report



Audit Sheet

Rev.	Description	Prepared and checked by	Reviewed by	Date
Α	First Issue	LB	ТН	17.11.15
В	First Issue	LB	ТН	08.01.16
С	Changes to Planning Requirements	LB	ТН	15.02.19
D	Minor Amendments to Planning Conditions	LB	ТН	21.02.19



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1.0 Introduction

This report has been prepared to document the data used to inform the Part L1A 2013 assessment for the new residential development at 59 Maresfield Gardens.

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 planning application 2015/3506/P, condition 14 that states the development must achieve a 19% reduction beyond Part L 2013 Building Regulation compliance.

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.

 Ω End of Section



2.0 Planning Permission

Condition 14 of the decision notice relating to application 2015/3506/P, dated 26th August 2016, states the requirements for demonstrating that the development's carbon emissions will target a minimum 19% reduction beyond Part L 2013 Building Regulations, in line with the energy hierarchy.

 Ω End of Section



3.0 Building Proposed Carbon Reduction Measures

This section details the measures required to meet the 19% carbon reduction within the planning application whist also complying with Part L1a 2013 regulations.

3.1 Proposed Fabric Details

The following construction details have been applied in CH's preliminary As Designed SAP calculation in order to achieve a Target Fabric Energy Efficiency TFEE) of 60.75 kWh/m².

Passive Item	Values
External Wall U-Value	0.13 W/m²K
Roof U-Value	0.1 W/m ² K
Ground Floor U-Value	0.1 W/m ² K
Front Door U-Value	1.4 W/m²K
Windows U-value	1.4 W/m²K
Glazing Type	Doubled glazed
Thermal Bridging (Y Value)	0.15 Default within SAP 2012
Air Permeability	4 m3/h.m2 at 50 Pa

By the use of these measure the Dwelling Fabric Energy Efficiency (DFEE) is 64.19 kWh/m^2 , -5.66% below building regulations requirements.

3.2 Proposed Services Details

The following services details have been applied in CH's preliminary As Designed SAP calculation in order to achieve a Target Carbon Dioxide Emission Rate (TER) of 21.18kg/m².

Services Item	Values
Main Heating Fuel:	Electricity (1.55 fuel
	factor)
Main Heating System:	Ground Source Heat
	Pump with Underfloor
	Heating.
Ground Source Heat Pump (GSHP)	SAP Table with an
	efficiency of 224.4%
Heating System Controls:	Time and temperature
	zone control.
Hot Water System:	Stored hot water, heated
	by GSHP only. Separate
	time control for space
	and water heating.
Hot Water Storage:	500 Litre cylinder
	insulted with 80mm of
	factory applied foam.
Primary water heating losses:	Primary pipework
	insulted, cylinder
	temperature controlled
	by thermostat.
% Low Energy Light Fittings:	100
LZC Technologies:	Photovoltaic, 8 panels
	with a kWp of 2.61.
	South facing and
	elevated at 30°



By the use of these measure the Dwelling Carbon Dioxide Emission Rate (DER) is 14.20 kg/m², 32.95% over the building regulation requirements.



4.0 Conclusion

This assessment has demonstrated that the 19% LZC reduction in carbon emissions as requested by The London Borough of Camden is achievable through the implementation of the following strategy:

- The use of Ground Source Heat Pump as the main heating source for the dwelling.
- An array of 8 Photovoltaic panels on the roof with a peak kW load of 2.61.

4.1 Further Measures to be considered

- Details of proposed thermal bridging for building junction. Will these bridges be designed in-line with 'Accredited Construction Details' (ACD). This will help to achieve a more comfortable Dwelling Fabric Energy Efficiency (DFEE).
- Further U value reductions on the external glazing.
- Reduction in the air permeability.

Ω End of Section



Appendix A – Preliminary 'As Designed' SAP Calculations





SAP Calculations

Client:

Project: 59, Maresfield Gardens LONDON, NW3 5TE

Contact: Luke Brehaut Cooper Homewood Limited Ibrehaut@cooperhomewood.com





Buildir	ng Regu	lation (Com	npliar	nce			Page	e 2 of 8
Property Reference: 59 Maresfield C Survey Reference: As Designed GS Property: 59, Maresfield Gardens, LONDON, NW	Gardens SHP with	PV				Issued or Prop Typ	n Date: De Ref:	17.Nov.2	2015
SAP Rating: 84 B CO2 Emissions (t/year): Environmental:85 B General Requirements Complia	3.75 DI ance: Pass DI	E R: 13.38 P F EE: 60.64 P	ass ass	TER: TFEE:	21.18 60.75	Perce Perce	ntage DE ntage DF	ER <ter: EE<tfee< td=""><td>36.83 % : 0.18 %</td></tfee<></ter: 	36.83 % : 0.18 %
CfSH Results Version:	ENE1 C	redits: N/A	ENE2	Credits:	N/A EN	E7 Credits:	N/A	CfSH Level	:: N/A
Surveyor: Luke Brehaut, Tel: 014898614 Address: The Sawmills, Durley, Southam Client:	81 ipton, Hamps	shire, SO32	2 2EJ		<u> </u>	S	urveyor	ID: E85	4-0002
Software Version: Elmhurst Energy Systems S SAP version: SAP 2012, Regs Region: Englan	AP2012 Cal d (Part L1A 2	culator (De 2013), Calo	sign : culatio	System) versio e: New [n 3.02r10 Dwelling A	s Desię	gned	
SUMMARY FOR INPUT DATA FOR New Bu	iild (As Desig	ned)							
1a TER and DER Fuel for main heating: Fuel factor: Target Carbon Dioxide Emission Rate Dwelling Carbon Dioxide Emission Rate	(TER) te (DER)	Electric 1.55 (el 21.18 k 13.38 k	ity ectri g/m ² g/m ²	city)					ОК
Target Fabric Energy Efficiency (TFEE Dwelling Fabric Energy Efficiency (DF	E) EE)	60.75 k 60.64 k	Wh/r Wh/r	m² m²					OK
2 Fabric O-values	A	_		المام م	1				
Element External wall Party wall Floor Roof	Averag 0.13 (m 0.00 (m 0.10 (m 0.10 (m	e nax. 0.30 nax. 0.20 nax. 0.25 nax. 0.20)))	Highe 0.13 (- 0.10 (0.10 (est (max. ((max. ((max. (0.70) 0.70) 0.35)			OK OK OK OK
Openings	1.40 (m	nax. 2.00)	1.40	(max. :	3.30)			OK
Thermal bridging calculated using defa	ault v-value	e of 0.15							
3 Air permeability Air permeability at 50 pascals: Maximum		4.00 (de 10.0	esigr	n value	e)				ОК
4 Heating efficiency Main heating system:		Heat pu Electric Ground	ımp -to-v	with ra vater h	adiator neat pu	s or und Imp	lerfloo	r -	
Secondary heating system:		None							
Hot water storage		Nomina Permitte	l cyli ed by	inder I y DBS	oss: 3 CG 3.	.59 kWł 92	n/day		OK
6 Controls		res							
Space heating controls: Hot water controls:		Time ar Cylinde Indeper	nd te rstat nden	mpera t time	ature z r for Di	one cor HW	itrol		OK OK OK
7 Low energy lights Percentage of fixed lights with low-energy fittings:	ergy	100%							
Minimum 8 Mechanical ventilation		75%							OK
Not applicable 9 Summertime temperature									

Building Regulation Compliance Page 3 of							
Overheating risk (Thames Valle	y):	Not significant	OK				
Based On:							
Overshading:		More than average					
Windows facing North:		6.78 m ² , No overhang					
Windows facing East:		46.18 m ² , No overhang					
Windows facing West:		44.77 m ² , No overhang					
Air change rate:		8.00 ach					
Blinds/curtains:		None					
10 Key features							
External wa	all U-value	0.13 W/m ² K					
Party wall I	J-value	0.00 W/m ² K					
Roof U-val	ue	0.10 W/m ² K					
Floor U-val	ue	0.10 W/m ² K					
Photovoltai	c array						

59, Maresfield Gardens, LONDON, NW3 5TE Dwelling type: Date of assessment: Produced by: Total floor area: House, Semi-Detached 17.Nov.2015 Cooper Homewood Limited 351.8 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.



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



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



Issued on Date: 17.Nov.2015

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Prop Type Ref:

Summary Information

Property Reference: 59 Maresfield Gardens **Survey Reference:** As Designed GSHP with PV

Property: 59, Maresfield Gardens, LONDON, NW3 5TE

SAP Rating: Environmental	84 B CO2 Emissions (t/year): 85 B General Requirements Compliance:	3.75 Pass	DER: 1 DFEE:6	3.38 0.64	Pass Pass	TER: TFEE:	21.18 60.75	Percer Percer	ntage [ntage [DER <ter: DFEE<tfee< th=""><th>36.83 % : 0.18 %</th></tfee<></ter: 	36.83 % : 0.18 %
CfSH Results	Version:	ENE	1 Credits:	N/A	ENE2	2 Credits:	N/A ENE7	Credits:	N/A	CfSH Leve	: N/A
Surveyor: Address: Client:	Luke Brehaut, Tel: 01489861481 The Sawmills, Durley, Southamptor	n, Han	npshire,	SO3	32 2E.	J		Sı	urveyo	or ID: E85	4-0002
Software Ver	sion: Elmhurst Energy Systems SAP2	2012 (Calculate	or (D	esign	System) version	3.02r10			

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	House, Semi-Detached									
2.0 Number of Storeys	5									
3.0 Date Built	2015									
3.0 Property Age Band										
4.0 Sheltered Sides	2									
5.0 Sunlight/Shade	More than aver	age								
6.0 Measurements										
	Heat Loss Perimeter	Internal Floor Area	Average Sto	rey Height						
Basement:	44.29	84.09	2.5	0						
1st Storey:	39.88	64.07	2.8	0						
2nd Storey:	27.85	73.36	2.7	0						
3rd Storey:	28.39	68.90	2.7	0						
4th Storey:	32.35	61.38	2.7	0						
7.0 Living Area	44.27									
8.0 Thermal Mass Parameter	Precise calcula	tion								
9.0 External Walls										
Description	Construction		U-Value	Kappa	Gross Area	Nett Area				
External Wall	Cavity wall : pla block, filled cav	asterboard on dabs, AAC ity, any outside structure	0.13 60		461.58	356.36				
9.1 Party walls										
Description	Construction		Кар	pa A	Area					
Party Wall	Single plasterbo dense blocks, o	oard on dabs on both sides, avity or cavity fill	['] 70 39.83							
9.2 Internal Walls										
Description	Construction	Construction		Kappa Area						
Internal Wall	Dense block, de	ense plaster	10	D 5'	18.52					
10.0 External Roofs Description	Construction		U-Value	Карра	Gross Area	Nett Area				
External Roof	Plasterboard, ir	Plasterboard, insulated flat roof		9	84.09	58.66				
10.2 Internal Ceilings										
Description	Construction		Кар	pa A	Area					
Lower Basement Int Ceiling	Other	Other		6	4.08					
Upper Basement Int Ceiling	Plasterboard ce	eiling, carpeted chipboard floo	or 9	5	5.65					
Lower Grd Internal Ceiling	Plasterboard ce	eiling, carpeted chipboard floo	or 9	5	7.00					
Upper Grd Internal Ceiling	or 9	6	1.38							

11.0 HeatLoss Floors

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

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Description			Constru	ction			U-Val	ue	Kappa		Area		
Heat Loss Flo	oor		Slab on	ground, scr	eed over i	nsulation	0.10	D	110		84.09		
11.2 Internal Description	Floors		Constru	ction				Kappa		Area			
Upper Basem	nent Internal F	loor	Plasterb	oard ceiling	, carpeted	l chipboard flo	or	18		64.08			
Lower Groun	d Internal Floo	or	Plasterb	oard ceiling	, carpeted	l chipboard flo	or	18		55.65			
Upper Groun	d Internal Floo	or	Plasterb	oard ceiling	, carpeted	d chipboard flo	or	18		57.00			
First Floor Int	ernal Floor		Plasterb	oard ceiling	, carpeted	l chipboard flo	or	18		61.38			
12.0 Opening	Types												
Description	Data Source	Туре	Glazing	G	lazing Gap	Argon Filled	Sola	r Trans F	rame T	ype	Frame F	actor	U value
Window	Manufacturer	Window	Double L 0.05	ow-E Soft			(0.63			0.7	0	1.40
Roof Lights	Manufacturer	Roof Window	Double Lo 0.05	ow-E Soft			().63			0.7	0	1.40
Door	Manufacturer	Solid Door											1.40
13.0 Opening	IS							NA (* 1					0.1.1
Name	Opening Type	Location	1	Orientation	Curtain T	ype	verhang Ratio	Wide Overhang	Width	Height	Count	Area	Closed
Rooflights	Roof Window	[1] Exter	rnal Roof	Horizontal	None							25.43	
West Glazing	Window	[1] Exter	rnal Wall	West	None		0.00					44.77	
East Glazing	Window	[1] Exter	rnal Wall	East	None		0.00					46.18	
North Glazing	Window	[1] Exte	rnal Wall	North	None		0.00					6.78	
Front Door	Solid Door	[1] Exte	rnal Wall	East								3.17	
Lower Grd Door	Solid Door	[1] Exte	rnal Wall	East								2.16	
Rear Door	Solid Door	[1] Exte	rnal Wall	West								2.16	
14.0 Conserv	ratory		None										
15.0 Draught	Proofing		100										
16.0 Draught	Lobby		NO										
17.0 Thermal Y-value	Bridging		Default 0.150										
Descriptio	on Teating		Vee										
18.0 Pressure	a resting		1 es 4 00										
Property	Tested ?		4.00										
As Built q	50												
Same As	Designed ?												
19.0 Mechan	ical Ventilatior	1											
Mechanic	al Ventilation	System	NO										
Approved	Installation												
Windows	open in hot w	eather	Window	s fully open									
Cross ver	ntilation possib	ble	Yes										
Night Ver	ntilation		No										
Air chang Mechanic	e rate al Ventilation	data Type	8.00										
Type													
MV Refer	ence Number												
MVHR Di	uct Insulated												
Manufact	urer SFP												
Duct Type	e												
MVHR Ef	ficiency												
Wet Roor	ns odol												
20.0 Fans. O	pen Fireplace	s. Flues											
		M	IS SH	S Other	Total								
Number of Cl	himneys	()	0	0								
Number of or	en flues	()	0	0								
Number of in	termittent fans			-	8								
Number of pa	assive vents				0								
Number of flu	leless nas fire	s			ñ								
	Custor	-	Vac		0								
Cooled A	rea		100.00										

SUMMARY FOR INPUT DATA FOR New Build (As Designed) Page 7 of 8					
Data Source	SAP table				
Cooling Type	Packaged				
Energy Class	A				
Energy Efficiency Ratio					
System Control	Modulating				
22.0 Lighting					
Total number of light fittings	50				
Total number of L.E.L. fittings	50				
Percentage of L.E.L. fittings	100.00				
External					
External lights fitted	Yes				
23.0 Electricity Tariff	Standard				
24.0 Heating Systems					
Main Heating 1	SAP table				
Description	GSHP				
Percentage of Heat	100 %				
Description	None				
Percentage of Heat	%				
Community Heating					
Secondary Heating	None				
Water Heating	Main Heating 1				
Waste Water Heat Recovery	No				
Instantaneous System 1					
Waste Water Heat Recovery	No				
Instantaneous System 2					
Waste Water Heat Recovery Storage	No				
Solar Panel	Νο				
25.0 Main Heating 1					
Database Ref. No.					
Fuel Type					
Main Heating	PER				
SAP Code	221				
Efficiency (SAP Table) %	224.4				
Efficiency (SAP Table) %					
In Winter					
In Summer Model Name					
Manufacturer					
Controls	CHD Time and temperature zone control				
PCDF Controls	0				
Delayed Start Stat	2207				
Sap Code Burner Control	2207				
Boiler Compensator					
HETAS approved System					
Oil Pump Inside					
FI Case FI Water					
Smoke Control Area					
Fan Assisted Flue					
Is MHS Pumped	Pump in heated space				
Heat Emitter	Undemoor Yes - Pines in thin screed				
Flow Temperature	Yes - Pipes in thin screed				
Electric CPSU Temperature					
Combi boiler type					
Combi keep hot type					
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	
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 Dual
Summer Immersion	Duai
Suplementary Immersion	Yes
Immersion Only Heating Hot Water	
29.1 Flue Gas Heat Recovery System	
Database ID	
Brand Model	
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
	Tes Foam
Insulation Thickness	i Jam
Cylinder Volume	500.00
Loss (kwh/day)	
Pipes insulation	Fully insulated primary pipework
In Airing Cupboard	
31.0 Solar Panel	
Solar Panel Area	
Panel Type	
n0, a1, a2, A/G ratio	
Orientation	
Elevation	
Overshading	
Solar Storage Volume	
Combined Cylinder	
32.0 Thermal Store	None
Thermal Store Pipework	None
33.0 Photovoltaic Unit	One Dwelling
Apportioned KWh/Year	
PV Cells kW Peak Orientation Elevati	on Overshading
2.61 South 20°	Medact
	Widdest
34.0 Wind Turbines	
I errain Type	Urban
Count	
Apportioned Kwh/vear	
Rotor Diameter	
Hub Height	
35.0 Small-scale Hydro	
Electricity Generated	
Apportioned kWh/Year	
Recommendations	
None	
Further measures to achieve even higher	
Standards	