



THAKEHAM

CORNFIELD CLOSE - LITTLEHAMPTON

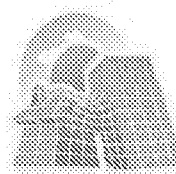


ENERGY STATEMENT

24th November 2020

SECA/PS-3603/B

ARUN DISTRICT COUNCIL LU/320/20/DOC



Southern Energy
Consultants
Energy & Sustainability Solutions

About Southern Energy Consultants Ltd

Southern Energy Consultants Ltd are a construction consultancy specialising in sustainability, energy conservation, the application of renewable technologies and statutory utilities infrastructure design and management. As a consultancy we do not sell or have financial interest in any products so are able to take an objective view of developments to assist developers with incorporating cost effective and practical solutions.

Our services include Planning Energy Statements, energy calculations for Building Regulation compliance, Code for Sustainable Homes assessments and utilities design and management. Our team of consultants include registered SAP, SBEM and Code for Sustainable Homes assessors, Planning Specialists, Renewable Energy Specialists, CAD Specialist, Utilities Specialists and Civil Engineers.

Within SEC Ltd we have over 25 years experience working with and for National Developers, Construction and Design and Build Contractors we apply our expertise not only to assist with developers understanding of new energy and sustainability obligations but also in a way that ensures that the needs and responsibilities of all stakeholders are wholly respected.

Report prepared by:
QA:

David Cook
Steve Smith

24th November 2020

Report type:

Planning Condition Discharge - Supporting Document

Revisions:

A - Minor wording revisions in accordance with Client request

B - Revised allocation of PV Panels in accordance with request from Client

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1.0 Introduction and Planning Policy Requirements

1.1 This Energy Statement has been commissioned by Thakeham Client (hereafter referred to as 'the Applicant') and carried out by Southern Energy Consultants as part of a comprehensive analysis of available opportunities to reduce carbon dioxide emissions and maximise the sustainability credentials of the proposed development on land south of Cornfield Close, Littlehampton. The proposals for the development relate to the construction of 77 dwellings of mixed type and tenure, as well as provision of access points, cycle storage and car parking infrastructure, landscaping, earthworks and drainage provision.

1.2 This Statement will provide the Applicant's response pertaining to the energy requirements of Condition 4 of the planning consent (Ref: LU/330/18/PL). This is worded by Arun District Council as follows:

"At least 10% of the energy supply of the development shall be secured from decentralised and renewable or low-carbon energy sources or equivalent fabric first standards that would secure a 10% reduction in energy use. Details and a timetable of how this is to be achieved, including details of physical works on site, shall be submitted to and approved in writing by the local planning authority. The approved details shall be implemented in accordance with the approved timetable and permanently retained as operational thereafter, unless otherwise agreed in writing by the Local Planning Authority."

1.3 Condition 4 is justified through Policy ECC SP2 (Energy and Climate Change Mitigation) of Arun District Council's Local Plan (2014). This policy requires all major developments of 10 or more dwellings to incorporate decentralised, renewable and low carbon energy supply systems, which must be responsible for producing at least 10% of the total predicted energy requirements from renewable or low carbon energy generation on site.

- 1.4 This Statement will provide the Applicant's response to Condition 4 and the underpinning Policy ECC SP2, paying specific attention to the energy proposals for the site, which will endeavour to utilise best practice energy efficiency techniques to minimise carbon dioxide emissions across the lifetime of the new development, then install sufficient renewable energy capacity to deliver at least a 10% reduction in carbon dioxide emissions and corresponding energy demand across the site.
- 1.5 Section 2 of this Statement calculates the baseline emissions for the development. These are the carbon dioxide emissions equivalent to the regulatory standard set by Part L1a of 2013 Building Regulations, encompassing the sources of space heating, hot water and fixed electrical items. Section 2 outlines the Applicant's best practice energy efficiency measures that will meet, and for most dwellings, exceed the emissions standard set by Part L1a. In Section 3, the outcome from a brief feasibility study concerning the most suitable renewable energy technology for the site is outlined, before the Applicant's proposals for meeting the 10% emissions reduction target are asserted.

2.0 Carbon Dioxide Emissions – Energy Efficiency Proposals

Baseline Carbon Dioxide Emissions

- 2.1 This section models the regulated (Part L1a, 2013 version) carbon dioxide emissions for proposed dwelling types using SAP (2012) methodology. These calculations have been carried out by an Elmhurst Accredited Assessor. SAP calculates the regulated carbon dioxide emissions associated with space heating, hot water and fixed electrical items. The baseline regulated annual carbon dioxide emissions for the 77 proposed dwellings at Cornfield Close are calculated to be **114,537 kgCO₂/year**. A plot-by-plot breakdown of this calculation is provided in the Appendix to this Statement.
- 2.2 In order to deliver a 10% reduction in carbon dioxide emissions across the Cornfield Close development, the Applicant must reduce emissions by at least **11,454 kgCO₂/year**.

Measures to comply with and better the baseline scenario

- 2.3 The build specification will incorporate enhanced insulation standards throughout the building envelope (walls, roofs, floors and glazing), for example, in the case of Linden Homes, by fully filling cavity walls with 140mm of Knauf 38 insulation (houses), fully filling and sealing all party walls, incorporating 100mm Xtratherm (0.022 W/m²K thermal conductivity) or equivalent insulation under screed in the ground floor and using enhanced double glazing to achieve average U-values considerably better than those insisted upon by Part L1A of 2013 Building Regulations.
- 2.4 Table 1 below sets out the fabric performance standards attained by the specification of the Applicant:

Table 1: Fabric Performance Standards – Land south of Cornfield Close, Littlehampton

Thermal Element	Maximum Area-Weighted U-value (W/m ² K) Allowable Under 2013 Building Regulations	Applicant's Proposed U-value (W/m ² K) required to Meet 2013 Building Regulations Baseline	% Improvement on 2013 Allowable U-Value Standard
Main external walls (houses)	0.30	0.23-0.24	20.00-23.33
Main external walls (apartments)	0.30	0.26-0.27	10.00-13.33
Roof (joists)	0.20	0.11	45.00
Ground floor	0.25	0.15-0.18	28.00-40.00
Windows	2.00	1.40	30.00

- 2.5 The space heating demand of the development will be reduced by the fabric measures detailed above and the considerable passive gains associated with the appropriate sizing of window openings in cases where an optimal southerly orientation applies for main living areas. All dwellings will also benefit from efficient heating controls, to include single zone controls, programmers, room thermostats (delayed start) and thermostatic radiator valves.

- 2.6 Air tightness standards will be improved by the Applicant adopting an array of details for non-repeating thermal bridges with linear heat transmission considerably lower than Accredited Construction Details. These details will incorporate an improvement over Building Regulations (2013) requirements by reducing air leakage loss and convective bypass of insulation. The Applicant will aim to reduce the design air permeability for all buildings from 10 m³/hm² to 5 m³/hm² to further reduce space heating requirements.
- 2.7 All of the internal lighting throughout the development will be of the dedicated low energy type. Although not assessed within the Building Regulations calculation, external lighting will also be low energy and some will be controlled through PIR sensors or daylight cut-off devices to minimise use and promote the security of the development.
- 2.8 All of the proposed gas boilers for the development will have a SEDBUK (2009) efficiency of at least 88.5%. In addition, boilers will be Class 5 for Nitrous Oxide emissions. This ensures they will not only be highly efficient in terms of energy use, but also have the lowest possible impact on local air pollution levels.
- 2.9 Ventilations to the dwellings will be either through highly energy efficient decentralised extract fans (Vent Axia Response).
- 2.10 It is not proposed to provide any mechanical cooling to the proposed dwellings in the form of air conditioning. Instead it is the intention of the Applicant to reduce the need for active cooling as far as possible. This will be achieved through the specification of mainly non-mechanical measures such as good thermal insulation and an air tight build. In addition, and although these issues are not calculated within a Building Regulations Assessment, the development proposals incorporate extensive areas of landscaped space. These measures facilitate localised cooling through evapotranspiration – energy which would otherwise heat the local atmosphere is instead used evaporating water, thus helping to reduce the urban heat island effect. Deciduous trees provide shading in the summer and facilitate solar gains in the winter. Openable windows will be installed as necessary to facilitate natural ventilation. These will help facilitate cross-ventilation, convective-ventilation and night purging.

Effects of energy efficiency measures

- 2.11 Further SAP calculations have been undertaken to model the impacts of the Applicant's proposed energy efficiency measures set out in paragraphs 2.2 to 2.9. Overall, across the site, carbon dioxide emissions are projected to reduce from **114,537 kgCO₂/year** to **111,932 kgCO₂/year**, a reduction of **2,605 kgCO₂/year**, or **2.27%** in proportional terms. A plot-by-plot breakdown of this calculation is provided in the Appendix to this Statement.
- 2.12 In order to deliver an overall reduction in carbon dioxide emissions of at least 10% across the Cornfield Close development, the Applicant must deliver a further reduction of at least **8,848 kgCO₂/year** through the incorporation of an appropriate renewable energy technology.

3.0 Renewable Energy Installations

- 3.1 As part of an early feasibility study for the site, it was determined that solar photovoltaic (PV) panels were the most suitable technology for delivering reductions in carbon dioxide emissions beyond those facilitated by best practice energy efficiency measures. Large areas of roof-space, of either optimal or close-to-optimal orientation, is available across the Cornfield Close development, with very limited overshadowing from surrounding trees and tall buildings.
- 3.2 In order to deliver a reduction in emissions of at least **8,848 kgCO₂/year**, further SAP calculations have verified that the Applicant must install at least **17.1 kWp** of solar photovoltaic capacity. This will generate a reduction of **9,054 kgCO₂/year** in carbon dioxide emissions. The Applicant's preference is to maximise opportunities to install solar PV panels to dwellings of optimal orientation, possessing large areas of roof-space. Thus the Solar PV Layout Plan and MCS Schedule in the Appendix to this Statement show that allocations are maximised to the two apartment blocks, including plots 60-65 and 66-77. A 7.2 kWp allocation is specified to plots 60-65, orientated almost due south, and a 9.9 kWp allocation is provided to plots 66-77, orientated due south and due west.

- 3.3 Table 2 below summarises the impacts of the Applicant's best practice energy efficiency measures and introduction of 17.1 kWp of solar photovoltaic output, comparing the eventual projected carbon dioxide emissions with the regulatory baseline standard.

Table 2: Emissions Reduction from Energy Efficiency Measures and Solar PV Installations – Land south of Cornfield Close, Littlehampton

	Emissions (kgCO ₂ /year)
Baseline	114,537
Reduction from energy efficiency measures	(2,605)
Reduction from 17.10 kWp solar PV output	(9,054)
Total reduction	(11,659)
Emissions after reductions	102,878
Overall percentage reduction from baseline	10.17

4.0 Conclusion

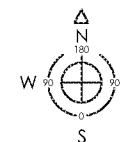
- 4.1 This Statement has set out the Applicant's energy strategy to the various sustainability requirements set by Condition 4 and underpinning Policy ECC SP2 (Energy and Climate Change Mitigation) of Arun District Council's Local Plan (2014). These required the Applicant to deliver a 10% reduction in carbon dioxide emissions compared to the current standard set by Part L1a of Building Regulations
- 4.2 The Applicant's first priority has been to minimise energy consumption at the point of demand. This will be achieved through the installation of highly efficient fabric, ventilation and heating systems, together with the benefits of passive solar gains and an air-tight build, all features which will help to lower the fuel bills of future occupants. Further reductions in carbon dioxide emissions and energy demand will then be secured through the installation of **17.1 kWp** of solar PV output, with priority given to maximising allocations on plots of optimal and close-to-optimal orientation. Overall, the Applicant's strategy of best practice energy efficiency measures and strategically located renewable energy installations will reduce carbon dioxide emissions by **10.17%** across the Cornfield Close development.

APPENDIX

Solar PV Layout Plan

MCS Schedule Calculations

Design SAP Summary



General Notes:

1. All Dimensions are in mm.
2. All Dimensions in abeyance and subject to confirmation by HBS Group Southern following design.
3. Images are for general information only.
4. HBS Group Southern reserve the right to revise this drawing in the interests of system development.
5. Inverters are to be located adjacent to the loft hatch in the loft space to minimise D.C cable runs and therefore minimise D.C losses.
6. Refer to manufacturers details for further product information.
7. This drawing layout does not account for any mansafe, plant, penetrations or miscellaneous equipment not shown.
8. It is the clients responsibility to notify HBS Group Southern of anything which may restrict the area available to the system or adjacent structures which would shade the system.
9. This drawing remains the intellectual property of HBS Group Southern and may be distributed only with permission expressed in writing.

Site Name:
Thakeham Homes - Cornfield Close

Drawing Title:
HBS PV - Indicative Site Layout

Drawing No:
PV-THA-COR-500

Revision:
C

Scale:
NTS

Paper size:
A3

Drawn By / Date:
EF - 19/12/19

Checked By:
RW

Status:
DES

Sheet:
001

C	Total Number of plots with PV indicated as per client comments	19/12/19	EF	RW
B	Total Number of plots with PV indicated	20/1/19	EF	RW



Thakeham Homes - Cornfield Close, Littlehampton - MCS Zone 2

PLOT NO	ROOF INCLINE	VARIATION° FROM SOUTH	OVERSHADING FACTOR	kWp	kWh	CO ₂ EQUIVALENT
060-65	35	20	1	7.2	8035.20	4170.27
066-77	35	45	1	9.9	9408.60	4883.06
Totals				17.1	17443.80	9053.33

The Performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate, based upon the MCS procedure, is given as guidance only. It should not be considered as a guarantee of performance.

This system performance calculation has been undertaken using estimated values for array orientation, inclination or shading. Actual performance may be significantly lower or higher if the characteristics of the installed system vary from the estimated results.

Appendix A

Cornfield Close, Littlehampton - SAP Performance Calculations

House Name	House Number	DER	TER	Total floor area	Total kg/year	Multiplier	Total DER	Total TER
Type E	Plot 1	18.35	19.37	94.16	1728	1	1728	1824
Type B	Plot 2	17.71	18.01	93.75	1660	1	1660	1688
Type B	Plot 22	17.78	18.14	93.75	1667	1	1667	1701
Type B	Plot 56	17.50	17.77	93.75	1640	1	1640	1666
Type B1	Plot 4	17.71	18.01	93.75	1660	1	1660	1688
Type B1	Plot 52,54	17.50	17.77	93.75	1640	2	3280	3332
Type B1	Plot 7	17.80	18.12	93.75	1668	1	1668	1699
Type B	Plot 17,37	17.55	17.82	93.75	1646	2	3291	3341
Type B	Plot 43	17.83	18.14	93.75	1672	1	1672	1701
Type B	Plot 51	17.50	17.77	93.75	1640	1	1640	1666
Type B	Plot 3	17.86	18.23	93.75	1674	1	1674	1709
Type B1	Plot 5	17.91	18.23	93.75	1679	1	1679	1709
Type B	Plot 23	17.50	17.82	93.75	1641	1	1641	1671
Type B1	Plot 53,55	17.53	17.80	93.75	1644	2	3288	3338
Type B	Plot 57	17.51	17.84	93.75	1642	1	1642	1673
Type B1	Plot 6	17.80	18.12	93.75	1669	1	1669	1699
Type B	Plot 16,36	18.08	18.14	93.75	1695	2	3390	3401
Type B	Plot 42	17.50	17.82	93.75	1641	1	1641	1671
Type B	Plot 50	17.32	17.62	93.75	1624	1	1624	1652
Type B2	Plot 18,20,38,40	17.78	18.14	93.75	1666	4	6666	6803
Type B2	Plot 19,21,39,41	17.50	17.82	93.75	1640	4	6562	6683
Type D	Plot 44,46,47,49	18.39	18.67	79.97	1471	4	5884	5972
Type D	Plot 45,48	16.38	17.41	79.97	1310	2	2620	2785
Type C3	Plot 8	18.87	19.20	79.72	1504	1	1504	1531
Type C3	Plot 15	18.87	19.20	79.72	1504	1	1504	1531
Type C2	Plot 9,14	17.35	18.06	79.72	1383	2	2767	2879
Type C2	Plot 11,12	18.92	19.27	79.72	1509	2	3017	3072
Type C2	Plot 10,13	17.34	18.06	79.72	1382	2	2764	2879
Type C	Plot 24,32	18.70	19.01	79.72	1491	2	2982	3031
Type C	Plot 27,35	18.81	19.13	79.72	1499	2	2999	3050
Type C1	Plot 25,26,,33,34	17.11	17.87	79.72	1364	4	5456	5698
Type C1	Plot 29,30	17.09	17.87	79.72	1363	2	2725	2849
Type C	Plot 28,31	18.75	19.05	79.72	1495	2	2990	3037
Type C4	Plot 58	18.40	18.65	79.72	1466	1	1466	1487
Type A	Plot 59	17.89	18.11	94.45	1690	1	1690	1710
2B4P GFF	Plot 60	19.34	19.41	70.00	1354	1	1354	1359
2B4P MFF	Plot 62	16.51	16.91	70.00	1156	1	1156	1184
2B4P TFF	Plot 64	18.10	18.53	70.00	1267	1	1267	1297
2B3P GFF	Plot 61	19.73	19.89	60.99	1203	1	1203	1213
2B3P MFF	Plot 63	17.11	17.61	60.99	1043	1	1043	1074
2B3P TFF	Plot 65	18.68	19.21	60.99	1139	1	1139	1172
1B2P GFF	Plot 67	19.65	20.14	49.75	978	1	978	1002
2B4P GFF	Plot 66	17.62	18.04	69.93	1232	1	1232	1262
2B4P FFF	Plot 70	15.10	15.77	69.93	1056	1	1056	1103
2B4P SFF	Plot 73	15.10	15.77	69.93	1056	1	1056	1103
2B4P TFF	Plot 76	16.96	17.52	69.93	1186	1	1186	1225
1B2P GFF	Plot 68	21.89	22.08	50.02	1095	1	1095	1104
1B2P FFF	Plot 71	18.20	18.39	61.32	1116	1	1116	1128
1B2P SFF	Plot 74	17.83	18.15	61.32	1093	1	1093	1113
1B2P TFF	Plot 77	19.42	19.77	61.32	1191	1	1191	1212
1B2P FFF	Plot 69	16.19	16.83	61.12	990	1	990	1029
1B2P SFF	Plot 72	15.83	16.62	61.12	968	1	968	1016
1B2P TFF	Plot 75	17.34	18.30	61.12	1060	1	1060	1118
							111,932	114,537

10% KgCO ₂ Target TER Reduction	Fabric Gains KgCO ₂ /yr	Residual KgCO ₂ Emissions Reduction from PV
11,454	2,605	8,848

Seaton Berg
Executive
Director, American

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Seaton Street
Exhibition

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Director, American

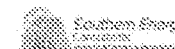
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Executive
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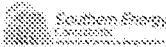
Floor	Type	Density kg/m ³	U-VALUE W/(m ² .K)	V-VALUE mm/sec	VENTILATION	MATERIALS LIST	PIN VALUES (%)	IF-WHITE W/(m ² .K) (0.67 W/m ² .K)	BLOCK INSULATION (%)	I-VARIABLE W/(m ² .K)	R-VALUES (%)	U-VALUE W/(m ² .K)	HOTTER	CORRECTION VENTILATION	WEATHERISED COMPENSATOR	ACCUMULATED HEATING	CHILLER	LIGHTING EFFICIENCY	REMARKS	
61	GFF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	N/A	N/A	a) 95mm Screed 100mm Xtratherm XT/UF Dense Block infilled Beam Flooring b) 100mm @ 0.022 W/m.k under PCC Plank	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC	
62	MFF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	N/A	N/A	N/A	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC	
63	MFF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	N/A	N/A	N/A	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC	
64	TTF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	a) Plank ceiling; 400mm Ø 0.044 W/m.k mineral wool insulation - 100mm between joists and 300mm over	A@ 0.11	N/A	N/A	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC
65	TTF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	a) Plank ceiling; 400mm Ø 0.044 W/m.k mineral wool insulation - 100mm between joists and 300mm over	A@ 0.11	N/A	N/A	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC
66	GFF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	N/A	N/A	a) 95mm Screed 100mm Xtratherm XT/UF Dense Block infilled Beam Flooring b) 100mm @ 0.022 W/m.k under PCC Plank	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC	
67	GFF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	N/A	N/A	a) 95mm Screed 100mm Xtratherm XT/UF Dense Block infilled Beam Flooring b) 100mm @ 0.022 W/m.k under PCC Plank	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC	
68	GFF	5.00	1.40	1.40	System 3: Vent Area Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K. Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 3: Tile on battens 100mm ≤ 0.45 W/m.k Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m ² .K. Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.k Medium Density Block 100mm Supawall Roll 36 100mm ≤ 0.45 W/m.k Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m ² .K.	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	N/A	N/A	a) 95mm Screed 100mm Xtratherm XT/UF Dense Block infilled Beam Flooring b) 100mm @ 0.022 W/m.k under PCC Plank	Valiant EcoRT Sustain B85 Combil	Delay Start Programmer Single Zone Control Radiators and TRVs	None	None	N/A	100%	TBC	

LITTLEHAMPTON - L1A 2013 COMPLIANCE SPECIFICATION

[illegible]



LITTLEHAMPTON - L1A 2013 COMPLIANCE SPECIFICATION



PLOT	TYPE	DESIGN PRESSURE TEST (N/MSQ)	U-VALUE EXT DOORS W/M ² K (2)	U-VALUE WINDOWS W/M ² K (2)	VENTILATION	WALL MAKE UP (3)	RAU VALUES (3)	PARTY WALLS (3)	U-VALUE W/M ² K (SAP2013)	ROOF INSULATION (3)	U-VALUE W/M ² K	FLOORS (3)	U-VALUE W/M ² K	BOILER	CONTROL / METERING	WEATHER/LOAD COMPENSATION	SECONDARY HEATING	CYLINDER	LOW ENERGY LIGHTING	REMARKS
77	TFF	5.00	1.40	1.40	System 3: Vent Axia Response	Type 1: 100mm Brick 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.K Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m²K . Type 2: Weatherboard on battens 100mm ≤ 0.45 W/m.K Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.K Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m²K . Type 3: Tile on battens 100mm ≤ 0.45 W/m.K Medium Density Block 50mm Cavity 50mm Xtratherm XT/CW 100mm ≤ 0.45 W/m.K Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.26 W/m²K . Type 4: 12.50mm Plasterboard on Dabs 100mm ≤ 0.45 W/m.K Medium Density Block 100mm Superwall Roll 36 100mm ≤ 0.45 W/m.K Medium Density Block 12.50mm Plasterboard on Dabs returning U-value 0.27 W/m²K .	NHBC, ACD, SAP K Default	Fully filled and sealed	0.00	a) Plane ceilings: 400mm 0.044 W/m.K mineral wool insulation - 100mm between joists and 300mm over.	a) 0.11	N/A	N/A	Valiant EcoFIT S60401-825 20196	Delay Start Programmer Single Zone Control Submains and TRVs.	None	None	N/A	100%	TSC

(1) For full list of details refer the Thermal Bridge Schedule within Design SAP Calculation Folders.
(2) Low-Emissivity Coating: 0.072
(3) Not all specification types apply to every plot refer to construction drawings for clarification

ISSUE DATE	REVISION	COMMENTS
13/09/2019	Design Issue	

ABNORMALS TO THAKEHAM STANDARD SPECIFICATION
Dual Zone Heating To Plot 1 Only

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