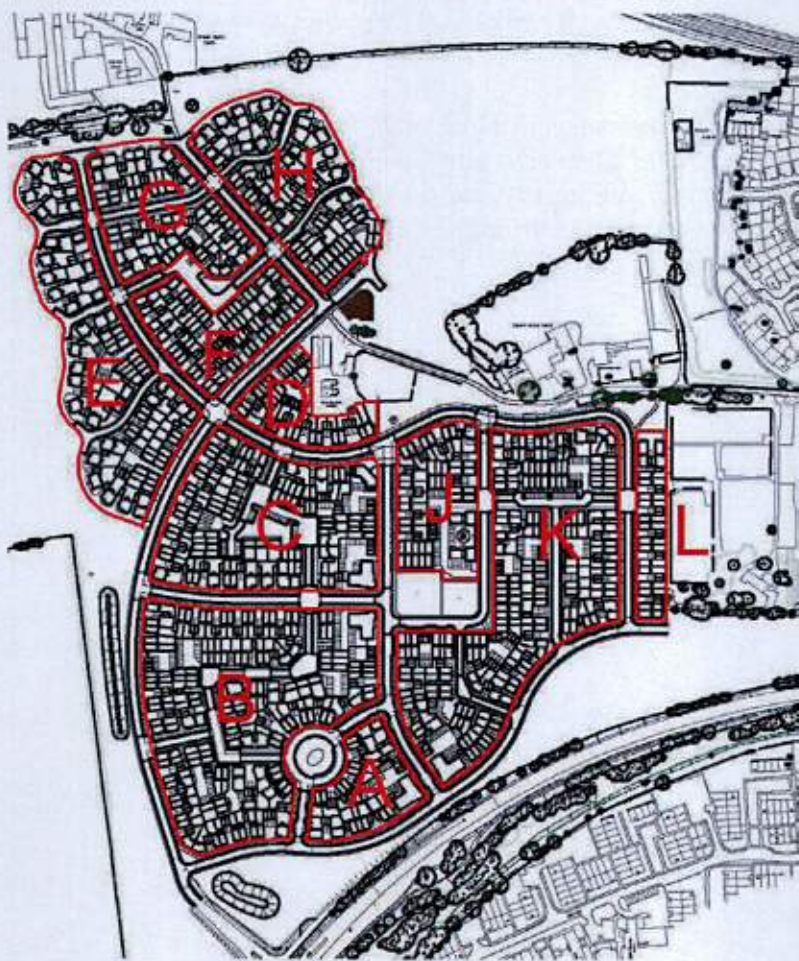




COURTWICK LANE - LITTLEHAMPTON



Energy Strategy to deliver compliance
with Arun Planning Condition 26 of Consent
Notice LU/355/10 dated 23/03/2012 for Bellway
Homes Wessex Phase 1B2

Date: 28th April 2014

SEC/cs/ES-3213_Rev_A



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:

Dave Cook/Steve Smith

28th April 2014

Report type:

Condition Discharge Supporting Document

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1.0 Introduction

- 1.1 This Energy Statement has been commissioned by Bellway Homes (hereafter referred to as 'the Client') and carried out by Southern Energy Consultants as part of a comprehensive analysis of available opportunities to reduce carbon dioxide emissions and energy consumption at the proposed Courtwick Lane, Littlehampton development (Outline Planning Application Reference: LU/355/10).
- 1.2 The development is located within the Arun District Council Local Authority and represents the construction of 600 residential dwellings (180 affordable), up to 4,000 m² of Class B1a and B1b employment floor-space, up to 235 m² of Class A1/A2/A3 local facilities, together with landscaping, green infrastructure provision, open space allocation, surface water attenuation and on-site pedestrian/cycle/bus access. Out of the total of 600 residential dwellings, half (300) will be delivered by Barratt Homes, and the remaining provision will be constructed by the Client. This Statement relates to the Client's energy proposals for Phase 1B2, which include a total of 70 dwellings of mixed type and tenure. Additional Energy Statements will be prepared by Southern Energy Consultants in relation to all other phases of residential development across the site.
- 1.3 This Statement will outline compliant proposals with regards to Planning Condition 26, as set out in the Decision Notice dated 23rd March 2013. Planning Condition 26 states:

"At least 10% of the energy supply of the development shall be secured from decentralised and renewable or low carbon energy sources (as described in the glossary of Planning Policy Statement: Planning and Climate Change, December 2007). Details and a timetable of how this is to be achieved for each phase or sub phase of development, including details of physical works on site, shall be submitted to and approved in writing by the local planning authority. The development shall be implemented in accordance with the approved details and timetable and retained as operational thereafter, unless otherwise agreed in writing by the local planning authority."

- 1.4 The reason given for the imposition of Condition 26 is as follows: *“in order to secure on site renewable energy in accordance with national planning policy”*. At a national level, guidance is stimulated by the Climate Change Act (2008) and fully espoused within the National Planning Policy Framework (2012) (NPPF). The Climate Change Act requires the UK Government to *“ensure that the net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline”*. This legal commitment sets the overriding objective for sustainable energy provision in the UK: the reduction of carbon dioxide emissions. It is therefore the minimisation of carbon dioxide emissions that must be given primacy over the maximisation of low carbon and renewable energy generation: a focus on the latter can restrict the strategies to most effectively meet the former. In 2012, the NPPF was published. This document asserts that:

“At the heart of the NPPF is a presumption in favour of sustainable development which should be seen as a golden thread running through both plan-making and decision-taking. For decision-taking this means:

- *Approving development proposals that accord with the development plan without delay; and*
- *Where the development plan is absent, silent or relevant, policies are out-of-date granting permission unless*
 - *Any adverse impacts of doing so would significantly and demonstrably outweigh the benefits when assessed against the policies in this Framework taken as a whole; or*
 - *Specific policies in this Framework indicate development should be restricted.”*

- 1.5 Paragraph 95 of the NPPF proceeds to state that:

“To support the move to a low carbon future, local planning authorities should:

- *Plan for new development in locations and ways which reduce greenhouse gas emissions;*
- *Actively support energy efficiency improvements to existing buildings; and*

- *When setting any local requirement for a building's sustainability, do so in a way consistent with the Government's zero carbon buildings policy and adopt nationally described standards."*

1.6 In the light of the requirements set by Planning Condition 26 and the NPPF, this Statement will set out an array of energy efficiency proposals, sufficient for the 70 proposed dwellings across Phase 1B2 at Courtwick Lane to deliver at least a 10% reduction in regulated carbon dioxide emissions. This approach is preferable to meeting the 10% standard via the introduction of bolt-on rooftop technologies, such as solar photovoltaic panels, which have a lifespan of approximately 25 years. In contrast, meeting the challenging requirements of Planning Condition 26 through energy efficiency measures enables these carbon dioxide emissions savings to persist over the lifetime of the development. Furthermore, and of equal importance, the focus on enhanced insulation standards and exceptional energy efficiency will result in reduced energy consumption for future occupants. This is especially important for future homeowners due to the recent upward escalation in domestic fuel bills across the UK.

1.7 In the first instance, this Statement will model the regulated carbon dioxide emissions associated with the dwelling types proposed in Phase 1B2. Subsequently, the Statement outlines the energy efficiency proposals that will be sufficient to deliver an average carbon dioxide reduction of at least 10% for the 70 dwellings. In order to demonstrate a compliant approach with Planning Condition 26, Standard Assessment Procedure (SAP) calculations based upon the current working drawings and construction specification, using Government approved Elmhurst software.

2.0 Baseline Calculation and Energy Efficiency Proposals

Energy Strategy

- 2.1 The formation of the energy strategy for the Courtwick Lane development takes into account several important concerns and priorities, all of which hark back to a need to incorporate measures to mitigate and adapt to the anticipated impacts deriving from climate change. The main objectives are a) to achieve at least a 10% reduction regulated carbon dioxide emissions through the application of an energy efficient approach and via an affordable and deliverable strategy, and b) to minimise the negative impact of the proposed development on the local and wider climate; in particular, to minimise to the lowest possible extent emissions of pollutants such as particulate matter, thereby minimising the effects on local air quality.

Building Regulations (2010) Baseline

- 2.2 In order that an energy assessment can be conducted, a Building Regulation (2010) Part L1A baseline for carbon dioxide emissions first has to be calculated for the seventy proposed dwellings in Phase 1B2 at Courtwick Lane. The estimated regulated carbon dioxide emissions for the dwelling have been calculated using SAP (2009) methodology and 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 heating fuel used to ascertain the baseline emissions for all dwellings is gas.
- 2.3 The baseline figure will then be used as a standard to demonstrate the reductions in predicted carbon dioxide emissions that will result from the proposed energy efficiency measures. Part (1) of the Appendix to this Statement (see column T x F x M) provides detailed examples of the breakdown of the regulated annual carbon dioxide emissions for the proposed dwellings, with the total figure for predicted annual carbon dioxide emissions being **106,973 kgCO₂**. The associated area-weighted average Target Emission Rate (kg/m²/yr) is 18.13 and is calculated using the following formulae:

$$\text{Area-Weighted TER} = \frac{\sum \text{TER} * F}{\sum F}$$

Where TER is Target Emission Rate; F is plot floor area in m²

- 2.4 Based upon the actual design proposals, the area-weighted average DER for the 70 plots is 16.09 kg/m²/yr, calculated using the following formulae:

$$\text{Area-Weighted DER} = \frac{\sum \text{DER} * F}{\sum F}$$

Where DER is Dwelling Emission Rate; and F is plot floor area in m²

- 2.5 The percentage difference between the two expressions is calculated as follows and summarised in Table 1 below:

$$\frac{\text{Area-Weighted TER} - \text{Area-Weighted DER}}{\text{Area-Weighted TER}} * 100$$

Table 1: Carbon Dioxide Emissions Reduction at Phase 1B2, Courtwick Lane

Area-Weighted TER (Kg/m ² /yr)	Area-Weighted DER (Kg/m ² /yr)	Percentage Reduction from Area-Weighted TER (%)
18.13	16.09	11.25

Energy Efficiency Proposals to Deliver the Area-Weighted DER Scenario

- 2.6 The proposed dwellings will incorporate enhanced insulation standards in the building envelope (walls, roofs, floors and glazing) to achieve average U-values considerably better than the limiting standards demanded by Part L1a of 2010 Building Regulations. Table 2 overleaf illustrates the proposed U-values and the limiting area-weighted values set by Part L1a of 2010 Building Regulations.

Table 2: Insulation Enhancement Proposals for Main Thermal Elements

Thermal Element	Maximum Area-Weighted U-value (W/m ² K) Allowable Under 2010 Building Regulations	Client's Proposed U-value (W/m ² K) Required To Meet 2010 Building Regulations Baseline	% Improvement On 2010 Allowable U-Value Standard
Main external walls	0.30	0.23	23.33
Roof (joists)	0.20	0.11	45.00
Ground floor	0.25	0.15	40.00
Windows	2.00	1.20	40.00

- 2.7 The Client intends to meet the U-value performance standards detailed in Table 2 through the construction measures set out in detail in Part (2) of the Appendix. A brief summary of the specification for the main thermal elements is provided below in Table 3.

Table 3: Fabric Enhancement Construction Specification

Construction Element	Delivered U-Value	Insulation Specification
Main external walls	0.23	100mm Thermalite blocks and 100mm cavity fully-filled with Knauf 'Supafil' 34 insulation.
Roof (joists)	0.11	One layer of 100mm Isover insulation quilt laid between ceiling joists and one layer of 300mm Isover laid over to provide a total thickness of 400mm.
Ground floor	0.15	Thermalite Floorblock Beam Infil (100mm), 75mm screed and 100mm Kingspan Thermafloor TF70

		rigid insulation.
Windows	1.20	PVCu double-glazed windows to specialist BFRC approved manufacturers design and specification.

- 2.8 The fabric measures detailed in Tables 2 and 3 result in a reduced space heating requirement for the development. The dwellings will also benefit from advanced Time and Temperature Zone controls. As such, it will be possible for future occupants to minimise the energy demand and carbon dioxide emissions associated with the heating operation of their home in two defined localities. The installation of delayed start thermostats will further improve the efficiency of the whole heating system, reducing demand and associated carbon dioxide emissions.
- 2.9 The specified boilers will be either the Ideal ICOS HE24 or Ideal Logic ES 30 Combi. These both have SEDBUK energy efficiency of greater than 88.5%. Where the Ideal ICOS HE24 boiler is installed, these dwellings will benefit from highly efficient hot water cylinders, with a daily heat loss of only 1.85 kWh.
- 2.10 Air tightness standards will be improved by the Client adopting Accredited Construction Details (predominantly Aircrete Product Association Methodology) for non-repeating thermal bridges. These details incorporate an improvement over Building Regulations (2010) requirements by reducing air leakage loss and convective bypass of insulation. The Client will reduce the dwelling's design air permeability from $10\text{m}^3/\text{hm}^2$ to $5\text{m}^3/\text{hm}^2$ to further reduce space heating requirements.
- 2.11 It is not proposed to provide any mechanical cooling to the proposed dwellings. Instead it is the intention of the Client 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. Ventilation to the dwellings will be facilitated via the installation of Greenwood CV2 GIP fans. These are very low energy and continuously operating extract fans, incorporating SMART Technology to reduce heat loss and

automatically sense humidity levels in kitchens, bathrooms and WCs. Each fan only uses 1.1 W of energy during operation. In addition, the development will adopt a range of passive ventilation measures. Openable windows will be installed as a necessary fixture to facilitate natural ventilation. These will help facilitate cross-ventilation, convective-ventilation and night purging.

- 2.12 100% of internal lighting throughout the development will be of the dedicated low energy type. Although not assessed under Building Regulations Part L1a, external lighting will also be low energy and some will be controlled through PIR sensors or daylight cut-off devices.

Summary

- 2.13 SAP calculations have demonstrated that the adoption of the robust design measures set out in Paragraphs 2.6 to 2.12 of this Statement results in an area-weighted DER figure of 16.09 kg/m²/yr, an 11.25% reduction on the area-weighted TER standard for the first 70 dwellings at Courtwick Lane.

3.0 Conclusion

- 3.1 This Energy Statement has set out the Client's Phase 1B2 energy strategy in response to Planning Condition 26 pertaining to their initial development of 70 dwellings at Courtwick Lane, Littlehampton. The strategy's focus has been to reduce energy consumption and carbon dioxide emissions at the point of demand. By introducing a robust fabric specification and efficient heating systems, the Client will ensure that, on average, the proposed dwellings exceed the Part L1a of 2010 Building Regulations standard for regulated carbon dioxide emissions by **11.25%**. This performance exceeds the 10% reduction requirement set by Condition 26, and is also over and above the mandatory energy performance standard set by Level 3 of the Code for Sustainable Homes.
- 3.2 The proposed strategy will be adopted on-site and its installation confirmed through the eventual production of an Energy Performance Certificate and 'as built' Building Compliance Report. Further Energy Statements will be submitted for future phases of the development to again demonstrate compliance with the terms of Condition 26.

APPENDIX

- 1) Carbon Dioxide Emissions, Weighted Average Summary
- 2) Plot Specific SAP Specification

Block Compliance

Page 1 of 2

Property Reference: SECCOU001

Issued on Date: 16.Feb.2014

Survey Reference: 001

Prop Type Ref: Semi

Property: T324A, Plots 101 & 102, Littlehampton

SAP Rating: 85 B	CO2 Emissions (t/year): 1.55	DER: 14.80 Pass	Reduction: 11.2%	FEE: 43.9	ZC8: 0.00
Environmental: 87 B	General Requirements Compliance: Pass	TER: 16.66		HLP: 1.06	Energy cost: £ 445

CfSH Results	Version: CfSH November 2010	ENE1 Credits: 1.4	ENE2 Credits: 7.5	ENE7 Credits: 0	CfSH Level: 3
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Surveyor: Steve Smith, Tel: 01635 36095, Fax: 01635 36095

Surveyor ID: D168-0001

Address: SEC House , 28 Grove Road, Newbury, Berkshire, RG14 1UL

Client: Bellway Wessex Bellway Wessex

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 4.02r03

SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Block Compliance Report

Property-Survey Reference	Multiplier (M)	Floor Area (F)	DER (D)	TER (T)	F x M	D x F x M	T x F x M
SECCOU001-001	2	116	14.80	16.66	232.00	3,433.60	3,865.12
SECCOU001a-001	1	116	14.83	16.66	116.00	1,720.28	1,932.56
SECCOU001ab-001	1	116	14.95	16.66	116.00	1,734.20	1,932.56
SECCOU001b-001	1	116	14.83	16.66	116.00	1,720.28	1,932.56
SECCOU001ba-001	1	116	14.95	16.66	116.00	1,734.20	1,932.56
SECCOU001c-001	1	116	14.91	16.66	116.00	1,729.56	1,932.56
SECCOU001ca-001	1	116	15.11	16.66	116.00	1,752.76	1,932.56
SECCOU002-001	2	116	15.10	16.66	232.00	3,503.20	3,865.12
SECCOU003-001	1	86.2	15.98	20.06	86.20	1,377.48	1,729.17
SECCOU004-001	1	89.4	15.50	18.41	89.40	1,385.70	1,645.85
SECCOU004a-001	1	89.4	16.08	18.41	89.40	1,437.55	1,645.85
SECCOU004b-001	1	89.4	15.88	18.41	89.40	1,419.67	1,645.85
SECCOU004c-001	1	89.4	15.84	18.41	89.40	1,416.10	1,645.85
SECCOU004d-001	3	89.4	15.86	18.41	268.20	4,253.65	4,937.56
SECCOU005-001	1	89.4	15.55	18.41	89.40	1,390.17	1,645.85
SECCOU005a-001	1	89.4	16.12	18.41	89.40	1,441.13	1,645.85
SECCOU005b-001	1	89.4	15.93	18.41	89.40	1,424.14	1,645.85
SECCOU006-001	1	89.4	16.14	18.41	89.40	1,442.92	1,645.85
SECCOU007-001	2	123	15.91	17.95	246.00	3,913.86	4,415.70
SECCOU008-001	1	150.5	14.56	16.69	150.50	2,191.28	2,511.85
SECCOU009-001	1	85.8	17.07	18.56	85.80	1,464.61	1,592.45
SECCOU010-001	1	112.75	16.12	18.33	112.75	1,817.53	2,066.71
SECCOU011-001	1	112.6	15.25	16.82	112.60	1,717.15	1,893.93
SECCOU011a-001	1	112.6	15.25	16.82	112.60	1,717.15	1,893.93
SECCOU012-001	1	111.7	15.19	17.01	111.70	1,696.72	1,900.02
SECCOU012a-001	1	111.7	15.19	17.01	111.70	1,696.72	1,900.02
SECCOU012b-001	2	111.7	13.70	14.71	223.40	3,060.58	3,286.21
SECCOU013-001	1	75	16.45	19.14	75.00	1,233.75	1,435.50
SECCOU013a-001	1	75	14.92	16.80	75.00	1,119.00	1,260.00
SECCOU014-001	1	80.8	17.15	18.97	80.80	1,385.72	1,532.78
SECCOU014a-001	1	80.8	17.01	18.97	80.80	1,374.41	1,532.78
SECCOU014b-001	2	80.8	17.01	18.97	161.60	2,748.82	3,065.55
SECCOU014c-001	2	80.8	16.98	18.97	161.60	2,743.97	3,065.55
SECCOU015-001	1	103.6	15.45	17.26	103.60	1,600.62	1,788.14
SECCOU016-001	1	60.5	18.08	20.18	60.50	1,093.84	1,220.89
SECCOU016a-001	1	60.5	17.91	20.18	60.50	1,083.56	1,220.89

SECCOU017-001	1	60.5	16.22	17.10	60.50	981.31	1,034.55
SECCOU017a-001	1	60.5	16.05	17.10	60.50	971.03	1,034.55
SECCOU018-001	1	61	18.25	20.08	61.00	1,113.25	1,224.88
SECCOU018a-001	1	61	17.46	20.08	61.00	1,065.06	1,224.88
SECCOU019-001	1	61	16.16	16.98	61.00	985.76	1,035.78
SECCOU019a-001	1	61	15.41	16.98	61.00	940.01	1,035.78
SECCOU020-001	1	61	17.32	19.00	61.00	1,056.52	1,159.00
SECCOU020a-001	1	61	16.55	19.00	61.00	1,009.55	1,159.00
SECCOU021-001	1	48.25	18.43	21.14	48.25	889.25	1,020.01
SECCOU021a-001	1	48.25	18.43	21.14	48.25	889.25	1,020.01
SECCOU022-001	1	48.25	16.15	18.01	48.25	779.24	868.98
SECCOU022a-001	1	48.25	16.52	18.01	48.25	797.09	868.98
SECCOU023-001	1	48.25	17.72	20.36	48.25	854.99	982.37
SECCOU023a-001	1	48.25	17.72	20.36	48.25	854.99	982.37
SECCOU024-001	1	60.75	18.03	20.03	60.75	1,095.32	1,216.82
SECCOU024a-001	1	60.75	18.03	20.03	60.75	1,095.32	1,216.82
SECCOU025-001	1	60.75	16.00	16.99	60.75	972.00	1,032.14
SECCOU025a-001	1	60.75	16.00	16.99	60.75	972.00	1,032.14
SECCOU026-001	1	56.1	17.58	19.43	56.10	986.24	1,090.02
SECCOU026a-001	1	56.1	17.58	19.43	56.10	986.24	1,090.02
SECCOU027-001	1	56.1	17.58	19.43	56.10	986.24	1,090.02
SECCOU027a-001	1	56.1	17.58	19.43	56.10	986.24	1,090.02
SECCOU028-001	1	75.4	18.63	21.74	75.40	1,404.70	1,639.20
SECCOU028a-001	1	75.4	19.07	22.47	75.40	1,437.88	1,694.24
SECCOU028b-001	1	75.4	19.07	22.47	75.40	1,437.88	1,694.24
SECCOU028c-001	1	75.4	19.13	22.47	75.40	1,442.40	1,694.24
Totals:	70	5094.45	1,020.23	1,148.62	5,901.55	94,965.61	106,973.12
Average DER = 16.09				PASS			
Average TER = 18.13							

PLOT	TYPE	OSGN GAP VIBRANT	SPH	% TER REDUCTION	FEE (W/M ² /YR)	DESIGN PRESSURE TEST (W/M ² /Hr @1)	U-VALUE (W/M ² /K)	WINDOWS W/M ²	VENTILATION	WALL MADE-UPS (J)	THERMAL BRIDGES	PARTY WALLS (W/M ² /K)	U-VALUE (W/M ² /K)	U-VALUE (W/M ² /K)	ROOF INSULATION (W/M ² /K)	U-VALUE WINDOWS	SLAB	U-VALUE W/M ² /K	ROLLER	CONTENTS / EXTERIOR	WEATHERING / CORROSION	CYLINDER	LOW ENERGY CERTIFICATE
302	T32AA	001	SECCDA001	31.16	43.90	5.00	1.10	1.20	System 1 Grounded C/S G/F	102 Brick 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 10 Central Boarding 25 Battens 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k 102 Brick 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 10 Central Boarding 25 Battens 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APN/AC27 Default	Fully Filled & Edge Sealed	0.00	U-Value Wind (W/M ² /K)	14.400 G100 W/M ² K Mineral Wool (10) 15 TWS Between rafters 150 TWS Under (1) 200mm Mineral Wool Ceiling Batts West Corner Batts	14.011 14.025 14.024 14.024	75 Scored 120 TFS 300mm Thermolite Hemelite Hemelite Beams Jamb	0.15	Red 125 182.5	Temp & Temperature Zone control Delay Start Prog warmer	Y	2100 L15 1000 L15	200%
302	T32AA	001	SECCDA001	31.16	43.90	5.00	1.10	1.20	System 1 Grounded C/S G/F	102 Brick 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 10 Central Boarding 25 Battens 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APN/AC27 Default	Fully Filled & Edge Sealed	0.00	U-Value Wind (W/M ² /K)	14.400 G100 W/M ² K Mineral Wool (10) 15 TWS Between rafters 150 TWS Under (1) 200mm Mineral Wool Ceiling Batts West Corner Batts	14.011 14.025 14.024 14.024	75 Scored 120 TFS 300mm Thermolite Hemelite Hemelite Beams Jamb	0.15	Red 125 182.5	Temp & Temperature Zone control Delay Start Prog warmer	Y	2100 L15 1000 L15	200%
304	T32AA	002	SECCDA002	30.20	44.90	5.00	1.10	1.20	System 1 Grounded C/S G/F	102 Brick 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 10 Central Boarding 25 Battens 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APN/AC27 Default	Fully Filled & Edge Sealed	0.00	U-Value Wind (W/M ² /K)	14.400 G100 W/M ² K Mineral Wool (10) 15 TWS Between rafters 150 TWS Under (1) 200mm Mineral Wool Ceiling Batts West Corner Batts	14.011 14.025 14.024 14.024	75 Scored 120 TFS 300mm Thermolite Hemelite Hemelite Beams Jamb	0.15	Red 125 182.5	Temp & Temperature Zone control Delay Start Prog warmer	Y	2100 L15 1000 L15	200%
306	T32AA	003	SECCDA003	31.24	44.90	5.00	1.10	1.20	System 1 Grounded C/S G/F	102 Brick 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 10 Central Boarding 25 Battens 100 Hemelite 100 Suppl 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APN/AC27 Default	Fully Filled & Edge Sealed	0.00	U-Value Wind (W/M ² /K)	14.400 G100 W/M ² K Mineral Wool (10) 15 TWS Between rafters 150 TWS Under (1) 200mm Mineral Wool Ceiling Batts West Corner Batts	14.011 14.025 14.024 14.024	75 Scored 120 TFS 300mm Thermolite Hemelite Hemelite Beams Jamb	0.15	Red 125 182.5	Temp & Temperature Zone control Delay Start Prog warmer	Y	2100 L15 1000 L15	200%

PLAT.	TYPE	DESIGN GAP VARIANT	% TOB REDUCTION	FEE (RM/KW/24 HRS)	ON-SET PROVISION TEST (kW/24HRS)	U-VALUE EXIST DOORS W/m ² K	U-VALUES WINDOWS W/m ² K	VENTILATION	WALL GABLE UPS (2)	THERMAL MASS (kg/m ²)	FAÇADE WALLS (Where Applicable)	U-VALUE WALLS (W/m ² K)	ROOF INSULATION (R-Value)	U-VALUE ROOF (W/m ² K)	SLAB	U-VALUE FLOOR (W/m ² K)	CELLAR	CONTROLS / SENSORS	HEATING/COOLING COMPARTMENT	CYLINDER	LOAN FINANCE INTEREST
307	V12AA	001	34.50	44.50	5.00	1.10	1.20	System 3 Greenwood CV2 GP	102 Brick 1200 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AN/CZ/ Default	Fully Filled & Edge Sealed	0.00	U-Value of 0.00 W/m ² K Mixed Wood 100 100 1000 Between rafters 100 1000 10000 Insulation 100 10000 Insulation Mixed Dampers Both	G10.13 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	75 Scored 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	Red Insulation 25 Cavity	Time & Temperature Zone control 1 Delay Start Programmer	Y	2.00% (1.00% Loan Rep. 1.00%)	3.00%	
308	V12AA	001	34.50	44.50	5.00	1.10	1.20	System 3 Greenwood CV2 GP	102 Brick 1200 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AN/CZ/ Default	Fully Filled & Edge Sealed	0.00	U-Value of 0.00 W/m ² K Mixed Wood 100 100 1000 Between rafters 100 1000 10000 Insulation 100 10000 Insulation Mixed Dampers Both	G10.13 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	75 Scored 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	Red Insulation 25 Cavity	Time & Temperature Zone control 1 Delay Start Programmer	Y	2.00% (1.00% Loan Rep. 1.00%)	3.00%	
309	H12A V1	003	20.48	48.20	5.00	1.10	1.20	System 3 Greenwood CV2 GP	102 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AN/CZ/ Default	Fully Filled & Edge Sealed	0.00	U-Value of 0.00 W/m ² K Mixed Wood 100 100 1000 Between rafters 100 1000 10000 Insulation 100 10000 Insulation Mixed Dampers Both	G10.13 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	75 Scored 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	Red Insulation 25 Cavity	Time & Temperature Zone control 1 Delay Start Programmer	Y	N/A	3.00%	
310	H12B	004	15.41	44.10	5.00	1.10	1.20	System 3 Greenwood CV2 GP	102 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AN/CZ/ Default	Fully Filled & Edge Sealed	0.00	U-Value of 0.00 W/m ² K Mixed Wood 100 100 1000 Between rafters 100 1000 10000 Insulation 100 10000 Insulation Mixed Dampers Both	G10.13 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	75 Scored 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	Red Insulation 25 Cavity	Time & Temperature Zone control 1 Delay Start Programmer	Y	N/A	3.00%	
311	H12B	005	15.41	44.10	5.00	1.10	1.20	System 3 Greenwood CV2 GP	102 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AN/CZ/ Default	Fully Filled & Edge Sealed	0.00	U-Value of 0.00 W/m ² K Mixed Wood 100 100 1000 Between rafters 100 1000 10000 Insulation 100 10000 Insulation Mixed Dampers Both	G10.13 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	75 Scored 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000 100 10000	Red Insulation 25 Cavity	Time & Temperature Zone control 1 Delay Start Programmer	Y	N/A	3.00%	
312	H12C	006	14.31	51.30	5.00	1.10	1.20	System 3 Greenwood CV2 GP	102 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Henselite 100 Supafix 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K 10 Central Boarding 125 Batton 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.2												

PLF#	TYPE	DESIGN CAP VARIANT	SER#	% RISE REDUCTION	AIR INH/1000/yr	DESIGN PRESSURE TEST (psi/hr psi)	U-VALUE BT DOORS W/m ² K	U-VALUER WINDOW W/m ² K	VENTILATION	WIND MASS-SP (2)	THERMAL BRIDGING	PAVY WALLS (Define Applicable)	U-VALUES W/DOOR (W/m ² K)	U-VALUES W/DOOR (W/m ² K)	REFR. INSULATION IN	U-VALUE W/DOOR W/m ² K	SLAB U-VALUE W/m ² K	U-VALUE W/DOOR W/m ² K	ROLLER	CONTRAST / MATTERS	WEATHER/LOAD COMPENSATION	COLLEGE	LOW ENERGY LIGHTING
113	OFF	016	SECC040816	10.41	45.35	5.10	1.30	1.30	System 1 Greenwood 0.12 GPa	102 Brick 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hemelite 100 Suppli 141 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 15 Batten 100 Hemelite 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K 102 Brick 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hemelite 100 Suppli 141 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 15 Batten 100 Hemelite 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	N/A	N/A	75 Screen 100 100 Thermalite Plasterboard on Dabs	0.13	Delay Start Programmer Thermocouple 100% 1 Solenoid	Y	N/A	300%		
115	OFF	016	SECC040816	9.11	48.30	5.10	1.30	1.30	System 1 Greenwood 0.12 GPa	102 Brick 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hemelite 100 Suppli 141 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 15 Batten 100 Hemelite 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	N/A	N/A	75 Screen 100 100 Thermalite Plasterboard on Dabs	0.13	Delay Start Programmer Thermocouple 100% 1 Solenoid	Y	N/A	300%		
116	OFF	016	SECC040816	9.99	45.10	5.10	1.30	1.30	System 1 Greenwood 0.12 GPa	102 Brick 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hemelite 100 Suppli 141 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 15 Batten 100 Hemelite 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	N/A	N/A	75 Screen 100 100 Thermalite Plasterboard on Dabs	0.13	Delay Start Programmer Thermocouple 100% 1 Solenoid	Y	N/A	300%		
117	OFF	017	SECC040817	5.15	39.40	5.00	1.30	1.30	System 1 Greenwood 0.12 GPa	102 Brick 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hemelite 100 Suppli 141 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 15 Batten 100 Hemelite 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	N/A	N/A	N/A	N/A	Delay Start Programmer Thermocouple 100% 1 Solenoid	Y	N/A	300%		
118	OFF	015	SECC040815	4.88	39.80	5.10	1.30	1.30	System 1 Greenwood 0.12 GPa	102 Brick 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hemelite 100 Suppli 141 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 15 Batten 100 Hemelite 100 Suppli 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	N/A	N/A	N/A	N/A	Delay Start Programmer Thermocouple 100% 1 Solenoid	Y	N/A	300%		

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FLOOR	TYPE	DECKED JAP VARIANT	U-VAL	N.TER. REDUCTION	FILE INFO/yr	DESIGN PRESSURE TEST (N/m ²)	U-VALUE EXT DOORS W/m ² K	U-VALUES WINDOWS W/m ² K	VENTILATION	WALL MASS (J/m ²)	THERMAL INSULATION	PARTY WALLS (Where Applicable)	U-VALUE W/m ² K	SLAB	U-VALUE W/m ² K	ROOF INSULATION	U-VALUE W/m ² K	U-VALUE W/m ² K	SOLEIL	CONTROLS / SENSORS	WARNING/LAND COMPLIANCE	COLUMNS	LOW ENERGY LIGHTING
131	GFP	016	SECC000024	11.25	44.30	5.00	1.10	1.20	Screen 1 Dimensional C/C/G/P	102 Brick 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Rensler 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 25 Butten 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K 102 Brick 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Rensler 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 25 Butten 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AC20 Default	Fully Filled & Edge Sealed	0.00	N/A	TS Scribed 100 100/100mm Thermalite Plasterboard Fluorescent Beams Jab	0.11	Red Logo 15.05 C/C/G/P	Delay Start Programmer Thermistat 1 100% / 1000000	Y	N/A	100%		
132	GFP	018	SECC000024	11.05	42.80	5.00	1.10	1.20	Screen 1 Dimensional C/C/G/P	102 Brick 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Rensler 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 25 Butten 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AC20 Default	Fully Filled & Edge Sealed	0.00	N/A	TS Scribed 100 100/100mm Thermalite Plasterboard Fluorescent Beams Jab	0.11	Red Logo 15.05 C/C/G/P	Delay Start Programmer Thermistat 1 100% / 1000000	Y	N/A	100%		
133	GFP	021	SECC000024	12.82	42.30	5.00	1.10	1.20	Screen 1 Dimensional C/C/G/P	102 Brick 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Rensler 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 25 Butten 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AC20 Default	Fully Filled & Edge Sealed	0.00	N/A	TS Scribed 100 100/100mm Thermalite Plasterboard Fluorescent Beams Jab	0.11	Red Logo 15.05 C/C/G/P	Delay Start Programmer Thermistat 1 100% / 1000000	Y	N/A	100%		
134	GFP	014	SECC000024	9.99	45.30	5.00	1.10	1.20	Screen 1 Dimensional C/C/G/P	102 Brick 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Rensler 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 25 Butten 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AC20 Default	Fully Filled & Edge Sealed	0.00	N/A	TS Scribed 100 100/100mm Thermalite Plasterboard Fluorescent Beams Jab	0.11	Red Logo 15.05 C/C/G/P	Delay Start Programmer Thermistat 1 100% / 1000000	Y	N/A	100%		
135	MFP	017	SECC000024	9.14	35.80	3.00	1.10	1.20	Screen 1 Dimensional C/C/G/P	102 Brick 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Rensler 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 25 Butten 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AC20 Default	Fully Filled & Edge Sealed	0.00	N/A	N/A	N/A	Red Logo 15.05 C/C/G/P	Delay Start Programmer Thermistat 1 100% / 1000000	Y	N/A	100%		
136	MFP	015	SECC000024	9.28	33.80	3.00	1.10	1.20	Screen 1 Dimensional C/C/G/P	102 Brick 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Rensler 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 25 Butten 100 Henselite 100 Supali 34 100 Thermalite Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	AP/AC20 Default	Fully Filled & Edge Sealed	0.00	N/A	N/A	N/A	Red Logo 15.05 C/C/G/P	Delay Start Programmer Thermistat 1 100% / 1000000	Y	N/A	100%		

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PUY	TYPE	DESIGN GAP VARIANT	SHR	% THE REDUCTION	EST kWh/m ² /year	DESIGN PRESSURE TEST m.kg/cm ²	U-VALUE EXT DOORS W/m ² K	U-VALUES WINDOWS W/m ² K	VENTILATION	WALL MASS CAPS (J)	THERMAL INSULATION	FAULTY WALLS (Where Applicable)	U-VALUES WALLS (W/m ² K)	ROOF INSULATION (W/m ² K)	U-VALUE SLAB W/m ² K	GLAZ	U-VALUE W/m ² K	COLL	CONTROLS / SENSITIV	WEATHER/LOAD COMPENSATION	CLAUDE	LOW ENERGY LIGHTING
143	FCU	02B	SECC0409A	19.11	69.92	6.00	1.10	1.20	System 1 Greenwood C13 GEP	102 Brick 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batten 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	U-400 G400 W/m ² K Mineral Wool 100 50 1500 Between rafters 100 1500 100 200mm Mineral Wool Slotted Batten Raft	U-0.11 U-0.12 U-0.13 U-0.14	75 Screed 100 T750 200mm Thermalize Plasterboard Beams (40)	0.15	Initial Logic E1.33 Control	Time & Temperature Zone control Delay Start Programmer	Y	N/A	100%
144	FCU	00A	SECC0409A	13.66	46.80	6.00	1.10	1.20	System 1 Greenwood C13 GEP	102 Brick 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batten 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	U-400 G400 W/m ² K Mineral Wool 100 50 1500 Between rafters 100 1500 100 200mm Mineral Wool Slotted Batten Raft	U-0.11 U-0.12 U-0.13 U-0.14	75 Screed 100 T750 200mm Thermalize Plasterboard Beams (40)	0.15	Initial Logic E1.33 Control	Time & Temperature Zone control Delay Start Programmer	Y	N/A	100%
145	FCU	00A	SECC0409A	12.46	47.00	6.00	1.10	1.20	System 1 Greenwood C13 GEP	102 Brick 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K 10 Central Boarding 125 Batten 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	U-400 G400 W/m ² K Mineral Wool 100 50 1500 Between rafters 100 1500 100 200mm Mineral Wool Slotted Batten Raft	U-0.11 U-0.12 U-0.13 U-0.14	75 Screed 100 T750 200mm Thermalize Plasterboard Beams (40)	0.15	Initial Logic E1.33 Control	Time & Temperature Zone control Delay Start Programmer	Y	N/A	100%
146	FCU	02B	SECC0409B	25.13	55.70	5.00	1.20	1.20	System 1 Greenwood C13 GEP	102 Brick 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batten 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	U-400 G400 W/m ² K Mineral Wool 100 50 1500 Between rafters 100 1500 100 200mm Mineral Wool Slotted Batten Raft	U-0.11 U-0.12 U-0.13 U-0.14	75 Screed 100 T750 200mm Thermalize Plasterboard Beams (40)	0.15	Initial Logic E1.33 Control	Programmer / Temperature Zone control Delay Start Programmer	Y	N/A	100%
147	FCU	002	SECC0409C	9.16	45.90	8.00	1.10	1.20	System 2 Greenwood C13 GEP	102 Brick 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batten 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	U-400 G400 W/m ² K Mineral Wool 100 50 1500 Between rafters 100 1500 100 200mm Mineral Wool Slotted Batten Raft	U-0.11 U-0.12 U-0.13 U-0.14	75 Screed 100 T750 200mm Thermalize Plasterboard Beams (40)	0.15	Initial Logic E1.33 Control	Time & Temperature Zone control Delay Start Programmer	Y	2700/1.35 W/m ² /day 100%	100%
148	FCU	002	SECC0409C	9.16	45.90	5.00	1.10	1.10	System 2 Greenwood C13 GEP	102 Brick 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding 125 Batten 100 Hermitee 100 Supali 34 100 Thermalize Turbo 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APN/AC2/ Default	Fully Filled & Edge Sealed	0.00	U-400 G400 W/m ² K Mineral Wool 100 50 1500 Between rafters 100 1500 100 200mm Mineral Wool Slotted Batten Raft	U-0.11 U-0.12 U-0.13 U-0.14	75 Screed 100 T750 200mm Thermalize Plasterboard Beams (40)	0.15	Initial Logic E1.33 Control	Time & Temperature Zone control Delay Start Programmer	Y	2700/1.35 W/m ² /day 100%	100%

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Plot	Type	Design SAP Variant	SAP	N.T.R. Reduction	Rise m/y/yr/year	Design Pressure Test m/(hr.m ²)	U-Value Ext Doors W/m ² K	U-Values Windows W/m ² K	Ventilation	Wall Mass U-P/S	Thermal Bridging	Fairly Walls (Where Applicable)	U-Value W/M ² K (WIP2009)	Roof insulation (m)	U-Value W/m ² K	SLAB	U-Value W/m ² K	Battler	Controls / Switches	Weather/Land Compensation	Chairs	Low Energy Lighting
108	T3T7	0126	SECCO00126	10.30	44.20	5.00	1.30	1.20	System 1 Unventilated CO2 CP	100 Bricks [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render [100 Henestie] 100 Suppl 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding [25 Butten] 100 Henestie [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APACALY Default	Fully Filled & Edge Sealed	0.00	J4 400 0.040 w/m ² K Mineral Wool J4 140 0.040 w/m ² K J4 140 0.040 w/m ² K Between rafters [50 100mm] Under J4 200mm Mineral Wool Downer Beams	J4 0.11 J4 0.25 J4 0.25 J4 0.24	T5 Screed [100 TFFS 300mm Thermalite Heatbreak Beams]	0.15	Time & Temperature Zone control Safety Start Prog Planner	Yes	2.00x1.80 600/1000 mm	100%	
109	T3T7	0126	SECCO00126	9.87	44.40	5.00	1.30	1.20	System 1 Unventilated CO2 CP	100 Bricks [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render [100 Henestie] 100 Suppl 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding [25 Butten] 100 Henestie [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APACALY Default	Fully Filled & Edge Sealed	0.00	J4 400 0.040 w/m ² K Mineral Wool J4 140 0.040 w/m ² K J4 140 0.040 w/m ² K Between rafters [50 100mm] Under J4 200mm Mineral Wool Downer Beams	J4 0.11 J4 0.25 J4 0.25 J4 0.24	T5 Screed [100 TFFS 300mm Thermalite Heatbreak Beams]	0.15	Time & Temperature Zone control Safety Start Prog Planner	Yes	2.00x1.80 600/1000 mm	100%	
109	T3T7	0114	MEED00114	9.39	46.10	5.00	1.30	1.20	System 1 Unventilated CO2 CP	100 Bricks [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render [100 Henestie] 100 Suppl 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding [25 Butten] 100 Henestie [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	APACALY Default	Fully Filled & Edge Sealed	0.00	J4 400 0.040 w/m ² K Mineral Wool J4 140 0.040 w/m ² K J4 140 0.040 w/m ² K Between rafters [50 100mm] Under J4 200mm Mineral Wool Downer Beams	J4 0.11 J4 0.25 J4 0.25 J4 0.24	T5 Screed [100 TFFS 300mm Thermalite Heatbreak Beams]	0.15	Time & Temperature Zone control Safety Start Prog Planner	Yes	2.00x1.80 600/1000 mm	100%	
108	H3B8	006	SECCO0006	13.36	40.00	5.00	1.30	1.20	System 1 Unventilated CO2 CP	100 Bricks [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render [100 Henestie] 100 Suppl 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding [25 Butten] 100 Henestie [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	ANACALY Default	Fully Filled & Edge Sealed	0.00	J4 400 0.040 w/m ² K Mineral Wool J4 140 0.040 w/m ² K J4 140 0.040 w/m ² K Between rafters [50 100mm] Under J4 200mm Mineral Wool Downer Beams	J4 0.11 J4 0.25 J4 0.25 J4 0.24	T5 Screed [100 TFFS 300mm Thermalite Heatbreak Beams]	0.15	Time & Temperature Zone control Safety Start Prog Planner	Yes	N/A	100%	
109	H3B8	006	SECCO0006	11.85	46.30	5.00	1.30	1.20	System 1 Unventilated CO2 CP	100 Bricks [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render [100 Henestie] 100 Suppl 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding [25 Butten] 100 Henestie [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	ANACALY Default	Fully Filled & Edge Sealed	0.00	J4 400 0.040 w/m ² K Mineral Wool J4 140 0.040 w/m ² K J4 140 0.040 w/m ² K Between rafters [50 100mm] Under J4 200mm Mineral Wool Downer Beams	J4 0.11 J4 0.25 J4 0.25 J4 0.24	T5 Screed [100 TFFS 300mm Thermalite Heatbreak Beams]	0.15	Time & Temperature Zone control Safety Start Prog Planner	Yes	N/A	100%	
100	H3B8	006	SECCO0006	11.85	46.10	5.00	1.30	1.20	System 1 Unventilated CO2 CP	100 Bricks [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 15 Render [100 Henestie] 100 Suppl 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² K 10 Central Boarding [25 Butten] 100 Henestie [100 Suppl] 34 [100 Thermallite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² K	ANACALY Default	Fully Filled & Edge Sealed	0.00	J4 400 0.040 w/m ² K Mineral Wool J4 140 0.040 w/m ² K J4 140 0.040 w/m ² K Between rafters [50 100mm] Under J4 200mm Mineral Wool Downer Beams	J4 0.11 J4 0.25 J4 0.25 J4 0.24	T5 Screed [100 TFFS 300mm Thermalite Heatbreak Beams]	0.15	Time & Temperature Zone control Safety Start Prog Planner	Yes	N/A	100%	

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PAGE	TYPE	DRAWING NO.	N.E.E. REDUCTION	FRI kWh/m ² /year	SOLAR PRESURE TEST m(N/a)	U-VALUE EXT DOORS W/m ² K	U-VALUES WINDOWS W/m ² K	VENTILATION	WALL MASS OPS (J)	THERMAL INERTIA (kJ/m ² °C)	PARTY WALLS (Thermal Approach)	U-VALUES W/M ² K (Party Walls)	ROOF INSULATION U	U-VALUE W/M ² K	SLAB	U-VALUE W/M ² K	BOILER	CONTROLS / BATTERIES	MATERIALS/CLAD COMPATIBILITY	CORROSION	LOW ENERGY LIGHTING
187	Type 20	014	RECCO0654b	47.40	5.00	1.10	1.20	Scenario 1 Overheated CIV G/F	102 Brick [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render [100 Hemelite] 100 Supafix 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k ; 10 Central Boarding [25 Butten] 100 Hemelite [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APV/ACCV Default	Full Flood & High Sward	0.00	0.11 0.15 0.25 0.24	TS Sealed 100 TTT0 20kwh Thermatite Electric Boats etc	0.15	Red Logic ES 10 Core	Time 6 Temperature Zone control Boiler Start Programmer	Y	N/A	300%	
188	Type 20	014	RECCO0654b	47.40	5.00	1.10	1.20	Scenario 1 Overheated CIV G/F	102 Brick [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render [100 Hemelite] 100 Supafix 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k ; 10 Central Boarding [25 Butten] 100 Hemelite [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APV/ACCV Default	Full Flood & High Sward	0.00	0.11 0.15 0.25 0.24	TS Sealed 100 TTT0 20kwh Thermatite Electric Boats etc	0.15	Red Logic ES 10 Core	Time 6 Temperature Zone control Boiler Start Programmer	Y	N/A	300%	
189	Type 20	014	RECCO0654c	47.20	5.00	1.10	1.20	Scenario 1 Overheated CIV G/F	102 Brick [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render [100 Hemelite] 100 Supafix 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k ; 10 Central Boarding [25 Butten] 100 Hemelite [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APV/ACCV Default	Full Flood & High Sward	0.00	0.11 0.15 0.25 0.24	TS Sealed 100 TTT0 20kwh Thermatite Electric Boats etc	0.15	Red Logic ES 10 Core	Time 6 Temperature Zone control Boiler Start Programmer	Y	N/A	300%	
190	Type 20	014	RECCO0654d	47.20	5.00	1.10	1.20	Scenario 1 Overheated CIV G/F	102 Brick [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k 15 Render [100 Hemelite] 100 Supafix 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.24 w/m ² k ; 10 Central Boarding [25 Butten] 100 Hemelite [100 Supafix] 34 [100 Thermatite Turbo] 12.5 Plasterboard on Dabs returning U-Value of 0.22 w/m ² k	APV/ACCV Default	Full Flood & High Sward	0.00	0.11 0.15 0.25 0.24	TS Sealed 100 TTT0 20kwh Thermatite Electric Boats etc	0.15	Red Logic ES 10 Core	Time 6 Temperature Zone control Boiler Start Programmer	Y	N/A	300%	

Issue Date	Revision
Feb-14	Design Issue

[1] Refer to Thermal Design Requirements within Design Sub for detailed considerations.

Items in red text to be confirmed by Setway Walesa

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