



Energy Statement

Gleeson Homes

6 Europa Court
Sheffield Business Park
Sheffield
S9 1XE

14th May 2013

1. Executive Summary

Stroma Technology has been commissioned by Gleeson Homes to prepare an Energy Statement for planning submissions based on their existing house types. The house type specification has been designed to achieve compliance with Building Regulations 2010 Part L1a from a fabric first approach.

In accordance with sustainable design principles, energy demand should first be minimised. Proposed good practice U-values, use of enhanced construction details (Aircrete Product Association – Constructive Details) and low air permeability will minimise heat loss through the building envelope and the resulting load on the heating system. Similarly, large windows and high performance glass will encourage beneficial solar gain and minimise the risk of summertime overheating. Excellent natural daylight levels will reduce the use of artificial lighting. All these principles have been considered within the house type specification.

Key energy efficiency design measures include improved thermal conductivity in the form of reduced U-values to the roof, walls, windows and doors. This combined with a high airtightness level; utilising a high efficiency gas boiler has achieved a reduction of CO₂ Dwelling Emission Rate (DER) over the CO₂ Target Emission Rate (TER; Building Regulations threshold) between 1 and 12% (depending on house type). All calculations were performed for the worst case orientation of the dwelling. Summary of the SAP performance for all the house types can be found in the Appendix A.

2. Energy Statement

Gleeson's specification consists of traditional construction techniques with the following U-values for the principal elements:

- Ground floor – 110mm polyurethane insulation with 25mm vertical edge insulation – U-value 0.14 W/m²K
- External walls – Traditional construction, 100mm facing bricks, 100mm full fill cavity (polystyrene bonded beads or mineral wool insulation , k-value 0.034), 100mm inner leaf blockwork (k-value 0.15) – U-value 0.25 W/m²K
- Party walls – Two leaves of 100mm aggregate blocks, full fill cavity, party wall roll – U-value 0.00 W/m²K
- Windows – Double glazed Upvc, 4mm Pilkington glass, 16mm argon filled gap sealed – U-value 1.4 W/m²K
- Front door – U-value 0.8 W/m²K
- Rear doors – U-value 1.2 W/m²K
- Roof – 400mm glass fibre mineral wool – U-value 0.1 W/m²K
- Enhanced construction details (APA Constructive Details) – average Y-value 0.04

In order to further achieve Building Regulation compliance, the following were also incorporated into the design:

- Baxi Netatec Combi boiler – 88% efficiency
- Time and temperature zone control
- Air permeability value of 5
- Natural ventilation



Mark Sullivan
Head of Residential Services

3. Appendix A – SAP Results Summary

SAP Results Summary												
Property Type	Plot	Built Form	TER	DER	Percentage Improvement Over Building Regulations	Total Floor Area	FEE	Air permeability	ENE1 Credits	ENE2 Credits	ENE7 Credits	Building Regulations Results
House	Option D Type 101	Enclosed end	20.37	19.8	2.8	44.73	43.92	5	0.4	7.5	0	Yes
House	Option D Type 201 Mid	Mid-terrace	18.08	17.83	1.4	60.48	43.64	5	0.2	4.7	0	Yes
House	Option D Type 201 End	End-terrace	20.23	18.94	6.4	60.48	49.31	5	0.8	5.9	0	Yes
House	Option D Type 202 Mid (Porches isolated)	Mid-terrace	18.38	18.09	1.6	61.49	45.72	5	0.2	3.8	0	Yes
House	Option D Type 202 Mid (Porches adjoining)	Mid-terrace	18.13	17.93	1.1	61.49	44.9	5	0.1	4.1	0	Yes
House	Option D Type 202 End (Porches adjoining)	End-terrace	20.31	19.89	2.1	61.49	52.81	5	0.3	4.7	0	Yes
House	Option D Type 202 End (Porches isolated)	End-terrace	20.49	19.99	2.4	61.49	53.28	5	0.3	4.6	0	Yes
House	Option D Type 301 Mid	Mid-terrace	16.97	16.81	0.9	70.82	42.69	5	0.1	5.2	0	Yes
House	Option D Type 301 End	End-terrace	19.13	18.09	5.4	70.82	49.69	5	0.7	5.8	0	Yes
House	Option D Type 301 adjoining 201	Semi-detached	19.43	18.22	6.2	70.82	49.66	5	0.8	5.8	0	Yes
House	Option D Type 301 adjoining 309	Semi-detached	20.63	18.9	8.4	70.82	53.18	5	1	4.6	0	Yes
House	Option D Type 301 Det	Detached	21.23	19.16	9.8	70.82	54.66	5	1.2	4.1	0	Yes
House	Option D Type 302 adjoining 201	Semi-detached	19.55	18.73	4.2	70.56	53.17	5	0.5	4.6	0	Yes
House	Option D Type 302 adjoining 309	End-terrace	20.69	19.35	6.5	70.56	56.54	5	0.8	3.7	0	Yes
House	Option D Type 302 Det	Detached	21.36	19.66	8.0	70.56	57.91	5	1	3.4	0	Yes
House	Option D Type 303 Mid	Mid-terrace	17.67	17.28	2.2	71.65	44.31	5	0.3	4.3	0	Yes
House	Option D Type 303 Semi (Porched adjoining)	Semi-detached	19.44	18.29	5.9	71.65	49.28	5	0.7	5.9	0	Yes
House	Option D Type 303 Semi (Porched isolated)	Semi-detached	19.77	18.49	6.5	71.65	49.76	5	0.8	5.7	0	Yes
House	Option D Type 304 Det	Detached	21.3	19.91	6.5	71.7	56.79	5	0.8	3.6	0	Yes
House	Option D Type 305 Det	Detached	21.05	18.98	9.8	74.31	55.49	5	1.2	3.9	0	Yes
House	Option D Type 306 Det	Detached	20.46	18.03	11.9	86.78	53.56	5	1.5	4.5	0	Yes
House	Option D Type 307 Det	Detached	20.95	18.84	10.1	75.56	54.78	5	1.3	4.1	0	Yes
House	Option D Type 308 Det updated	Detached	20.41	18.51	9.3	90.65	56.51	5	1.2	3.7	0	Yes
House	Option D Type 309 End	End-terrace	19.93	18.28	8.3	74.95	51.82	5	1	5.1	0	Yes
House	Option D Type 309 adjoining 309	End-terrace	18.97	17.91	5.6	74.95	50.57	5	0.7	5.5	0	Yes
House	Option D Type 309 Mid (bw 301 and 309)	Mid-terrace	18.39	17.57	4.5	74.95	48.83	5	0.6	0.0	0	Yes
House	Option D Type 310 Det	Detached	20.44	18.54	9.3	74.95	53.21	5	1.2	4.6	0	Yes
House	Option D Type 400 Det	Detached	19.41	17.91	7.7	89.64	52.92	5	1	4.7	0	Yes
House	Option D Type 401 Semi	Semi-detached	17.2	15.97	7.2	99	46	5	0.9	7.0	0	Yes
House	Option D Type 401 Det	Detached	18.81	16.89	10.2	99	50.65	5	1.3	5.4	0	Yes
House	Option D Type 403 Det	Detached	19.28	18.25	5.3	97.38	54.19	5	0.7	4.3	0	Yes
House	Option D Type 404 Det	Detached	19.28	18.67	3.2	97.38	56.87	5	0.4	3.6	0	Yes
House	Option D Type 405 Det	Detached	18.85	16.76	11.1	105.63	51.72	5	1.4	5.1	0	Yes
House	Option D Type 406 Det	Detached	19.53	17.87	8.5	101.86	56.57	5	1.1	3.7	0	Yes

4. Appendix B – SAP Specification

Project Name	Gleeson Standard House Types - Option D
Project Number	02-10-18227
Revision	Revision E
SAP Assessor	Jerzy Golinski
Assessor Reference	STR000093

Design SAP Input Data Table				
Description		Reference/Source		Comments
Fabric U-values W/m ² K	Roof - horizontal ceiling	Specification	0.10	
	Roof - sloping ceiling	Specification	0.20	
	Roof - dormer	Specification	0.30	
	Wall external	Specification	0.25	
	Wall dormer	Specification	0.27	
	Wall dwelling/garage	Specification	0.23	
	Party Wall	Specification	0.00	Fully filled cavity (RD E-WM-20)
	Exposed Floor	Specification	0.20	
	Ground Floor	Specification	0.14	
	Windows	Specification	1.40	
	Doors - Front	Specification	0.80	
	Doors - Rear	Specification	1.20	
	y-value	Specification	APA details	Thermalite Shield block
Ventilation	Airtightness m3/(hr.m ²)	Specification	5.0	
	Mechanical Ventilation	Specification	Natural ventilation with extractor fans in wet rooms	Type 202 - No extract fan to the ground floor WC
Heating	Primary Heating System	Specification	Baxi Neta-Tec Combi 33GA	
	Controls	Specification	Time and temperature zone control	Type 202 Mid - delayed start thermostat and weather compensator
	Water Heating	Specification	From the primary heating source	
	Secondary Heating System	Specification	None	
Renewables		Specification	None	
Low energy lighting		Specification	100%	

REVISION	DESCRIPTION OF AMENDMENTS	DATE
I	First issue	14/12/2011
A	Thermal mass calculated (Types 202,304,400,403,404) and set to low (TMP<175kJ/m2K) (outstanding units). Boiler changed to Ideal Code Combi 33	06/02/2012
B	Boiler Baxi Neta-tec 33GA, No weather compensator and delayed start thermostat	20/06/2012
C	Aircrete Product Association Psi values used to calculate thermal bridging (Y-value), change to the garage wall construction (as RD E-WM-20)	22/10/2012
D	Garage Wall U-value - 0.23	25/01/2013
E	Update to Psi values based on new details from Aircrete Product Association, type 202 Mid - additional provision of delayed start thermostat and weather compensator	25/03/2013