Cairns Consulting NI
26 Silverwood Court
Lurgan
Craigavon BT66 6RP
07887541427

Project Information

Building type	Detached house		
Reference	Plot 235 type SR18.3		
Date	17 August 2025		
Client	Lagan Homes (Millmount) Ltd 19 Claredon Road Belfast BT1 3BG	Project	14 Millmount Village Green DUNDONALD BT16 1AW

SAP 2009 worksheet for New dwelling as built - calculation of energy ratings

1. Overall dwelling dimensions

	Area (m^2)	Av. Storey height (m)	Volume (m^3)	
Ground floor (1)	67.64	2.60	175.86	(3a)
First floor	55.03	2.72	149.68	(3b)
	122.67			**(4)**
			325.55	**(5)**

2. Ventilation rate

	main + seondary + other heating		m^3 per hour	
Number of chimneys	0 + 0 + 0	x 40	0.00	(6a)
Number of open flues	0 + 0 + 0	x 20	0.00	(6b)
Number of intermittent fans	4	x 10	40.00	(7a)
Number of passive vents	0	x 10	0.00	(7b)
Number of flueless gas fires	0	x 40	0.00	(7c)

		Air changes per hour	
		0.12	**(8)**
Pressure test, result q50	5.30		(17)
Air permeability		0.39	(18)
		2.00	**(19)**
		0.85	**(20)**
Infiltration rate incorporating shelter factor		0.33	(21)

Infiltration rate modified for monthly wind speed

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly average wind speed from Table 7											
5.40	5.10	5.10	4.50	4.10	3.90	3.70	3.70	4.20	4.50	4.80	5.10

54.10 (22)

Wind Factor

1.35	1.27	1.27	1.13	1.02	0.97	0.93	0.93	1.05	1.13	1.20	1.27

13.53 (22a)

Adjusted infiltration rate (allowing for shelter and wind speed)

0.45	0.42	0.42	0.37	0.34	0.32	0.30	0.30	0.35	0.37	0.40	0.42

4.46 (22b)

Ventilation : natural ventilation, intermittent extract fans

Effective air change rate

0.60	0.59	0.59	0.57	0.56	0.55	0.55	0.55	0.56	0.57	0.58	0.59

(25)

3. Heat losses and heat loss parameter

Element	Gross area, m²	Openings m²	Net area A, m²	U-value W/m²K	A x U W/K	kappa-value kJ/m²K	A x K kJ/K	
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W12			**1.260**	**1.15 (1.20)**	1.44			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W11			**1.260**	**1.15 (1.20)**	1.44			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (North) W10			**1.460**	**1.15 (1.20)**	1.67			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W17			**1.460**	**1.15 (1.20)**	1.67			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W13			**1.170**	**1.15 (1.20)**	1.34			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W12			**5.070**	**1.15 (1.20)**	5.81			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (North) W11			**1.460**	**1.15 (1.20)**	1.67			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W1			**0.270**	**1.15 (1.20)**	0.31			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W2			**1.990**	**1.15 (1.20)**	2.28			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W3			**1.990**	**1.15 (1.20)**	2.28			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W4			**1.460**	**1.15 (1.20)**	1.67			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W5			**1.460**	**1.15 (1.20)**	1.67			(27)
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W6			**1.460**	**1.15 (1.20)**	1.67			(27)

4. Water heating energy requirements **kWh/year**

Assumed occupancy, N 2.87 (42)

Annual average hot water usage in litres per day Vd,average 107.83 (43)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hot water usage in litres per day for each month											
118.61	114.30	109.98	105.67	101.36	97.04	97.04	101.36	105.67	109.98	114.30	118.61 (44)
Energy content of hot water used											
176.32	154.21	159.13	138.73	133.12	114.87	106.44	122.14	123.60	144.05	157.24	170.75

Energy content (annual) 1700.59 (45)

Distribution loss

26.45	23.13	23.87	20.81	19.97	17.23	15.97	18.32	18.54	21.61	23.59	25.61 (46)

store loss determined from EN 13203-2 tests, taken from boiler data record

0.00 (50)

Hot water cylinder loss factor (kWh/day) 0.0000 (51)

Volume factor 0.0000 (52)

Temperature factor 0.0000 (53)

Energy lost from store (kWh/day) 0.00 (55)

Total storage loss

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 (56)

Net storage loss

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 (57)

Primary circuit loss (annual) 0.00 (58)

Primary loss

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 (59)

Combi loss calculated for each month

28.46	25.70	28.45	27.53	28.44	27.52	28.43	28.44	27.52	28.45	27.54	28.46 (61)

Total heat required for water heating calculated for each month

204.77	179.91	187.58	166.26	161.56	142.39	134.87	150.58	151.12	172.49	184.77	199.21 (62)

Output from water heater for each month, kWh/month

204.77	179.91	187.58	166.26	161.56	142.39	134.87	150.58	151.12	172.49	184.77	199.21 (64)

2035.51 (64)

Heat gains from water heating, kWh/month

65.74	57.70	60.02	53.01	51.37	45.07	42.50	47.72	47.98	55.01	59.17	63.89 (65)

5. Internal gains

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Metabolic gains, Watts												
172.38	172.38	172.38	172.38	172.38	172.38	172.38	172.38	172.38	172.38	172.38	172.38	(66)
Lighting gains												
64.33	57.14	46.47	35.18	26.30	22.20	23.99	31.18	41.85	53.14	62.03	66.12	(67)
Appliances gains												
430.82	435.29	424.03	400.04	369.77	341.31	322.30	317.83	329.10	353.08	383.36	411.81	(68)
Cooking gains												
55.11	55.11	55.11	55.11	55.11	55.11	55.11	55.11	55.11	55.11	55.11	55.11	(69)
Pumps and fans gains												
10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	(70)
Losses e.g. evaporation (negative values)												
-114.92	-114.92	-114.92	-114.92	-114.92	-114.92	-114.92	-114.92	-114.92	-114.92	-114.92	-114.92	(71)
Water heating gains												
88.36	85.86	80.68	73.62	69.05	62.60	57.12	64.14	66.64	73.93	82.17	85.87	(72)
Total internal gains												
706.09	700.87	673.74	631.42	587.69	548.69	525.99	535.73	560.16	602.73	650.13	686.38	(73)

6. Solar gains (calculation for January)

	Area & Flux	g & FF	Shading	Gains
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W12	1.260 19.87	0.63 --	0.77	12.1466
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W11	1.260 19.87	0.63 --	0.77	12.1466
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (North) W10	1.460 10.73	0.63 --	0.77	7.5969
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W17	1.460 19.87	0.63 --	0.77	14.0747
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W13	1.170 19.87	0.63 --	0.77	11.2790
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W12	5.070 19.87	0.63 --	0.77	48.8757
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (North) W11	1.460 10.73	0.63 --	0.77	7.5969
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W1	0.270 47.32	0.63 --	0.77	6.1983
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W2	1.990 47.32	0.63 --	0.77	45.6835

Lighting calculations

	Area	g	FF x Shading

6. Solar gains (calculation for January)

	Area & Flux	g & FF	Shading	Gains
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W3	1.990 47.32	0.63 --	0.77	45.6835
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W4	1.460 19.87	0.63 --	0.77	14.0747
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W5	1.460 19.87	0.63 --	0.77	14.0747
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W6	1.460 47.32	0.63 --	0.77	33.5166
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (South) W7	1.270 47.32	0.63 --	0.77	29.1548
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (North) W8	1.270 10.73	0.63 --	0.77	6.6083
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W9	5.450 19.87	0.63 --	0.77	52.5390
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W13	1.900 19.87	0.63 --	0.77	18.3163
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W14	1.600 19.87	0.63 --	0.77	15.4243
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W15	1.460 19.87	0.63 --	0.77	14.0747
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (West) W16	1.460 19.87	0.63 --	0.77	14.0747
Window - Double-glazed, argon filled, low-E, En=0.1, soft coat (East) W17	4.370 19.87	0.63 --	0.77	42.1276
Solid door D1	1.910 0.00	0.00 --	0.77	0.0000
Full glazed door - Double-glazed, argon filled, low-E, En=0.1, soft coat (North) D2	3.800 10.73	0.63 --	0.77	19.7729
Total solar gains, January				485.04 (83-1)

Solar gains

485.04	889.23	1325.66	1870.49	2244.2	2348.7	2274.8	1987.58	1546.83	1053.53	593.21	406.76

(83)

Total gains

1191.13	1590.09	1999.41	2501.9	2831.9	2897.3	2800.8	2523.3	2107.0	1656.26	1243.34	1093.14

(84)

Lighting calculations

	Area	g	FF x Shading

7. Mean internal temperature

Temperature during heating periods in the living area, Th1 (°C) 21.00 (85)

Heating system responsiveness 1.00

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau												
59.30	59.64	59.64	60.27	60.66	60.84	61.02	61.02	60.57	60.27	59.97	59.64	
alpha												
4.95	4.98	4.98	5.02	5.04	5.06	5.07	5.07	5.04	5.02	5.00	4.98	
Utilisation factor for gains for living area												
1.00	0.98	0.94	0.82	0.62	0.43	0.28	0.32	0.60	0.90	0.99	1.00	(86)
Mean internal temperature in living area T1												
19.84	20.11	20.48	20.80	20.96	20.99	21.00	21.00	20.97	20.72	20.15	19.84	(87)
Temperature during heating periods in rest of dwelling Th2												
19.59	19.60	19.60	19.61	19.62	19.62	19.63	19.63	19.62	19.61	19.61	19.60	(88)
Utilisation factor for gains for rest of dwelling												
0.99	0.98	0.92	0.77	0.54	0.34	0.19	0.21	0.49	0.85	0.98	1.00	(89)
Mean internal temperature in the rest of dwelling T2												
18.12	18.51	19.02	19.42	19.59	19.62	19.63	19.63	19.61	19.35	18.58	18.12	(90)

Living area fraction (16.28 / 122.67) 0.13 (91)

Mean internal temperature (for the whole dwelling)

18.35	18.72	19.22	19.60	19.77	19.80	19.81	19.81	19.79	19.53	18.79	18.35	(92)

Apply adjustment to the mean internal temperature, where appropriate

18.35	18.72	19.22	19.60	19.77	19.80	19.81	19.81	19.79	19.53	18.79	18.35	(93)

8. Space heating requirement

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation factor for gains												
0.99	0.97	0.91	0.77	0.55	0.35	0.20	0.22	0.50	0.85	0.98	0.99	(94)
Useful gains												
1180.76	1543.50	1814.95	1914.00	1543.74	1013.18	566.46	566.35	1058.57	1407.25	1217.94	1085.65	(95)
Monthly average external temperature												
4.50	5.00	6.80	8.70	11.70	14.60	16.90	16.90	14.30	10.80	7.00	4.90	(96)
Heat loss rate for mean internal temperature												
2775.7	2735.4	2474.6	2150.3	1581.89	1016.49	566.59	566.58	1076.78	1722.09	2337.3	2680.9	(97)
Space heating requirement for each month, kWh/month												
1186.65	800.94	490.82	170.14	28.38	-	-	-	-	234.24	805.95	1186.87	

Total space heating requirement per year (kWh/year) (October to May) 4903.99 (98)

Space heating requirement per m² (kWh/m²/year) 39.98 (99)

8c. Space cooling requirement - not applicable

9a. Energy requirements

kWh/year

No secondary heating system selected

Fraction of space heat from main system(s)	1.0000	(202)
Efficiency of main heating system	90.20%	(206)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement												
1186.65	800.94	490.82	170.14	28.38	-	-	-	-	234.24	805.95	1186.87	(98)
Appendix Q - monthly energy saved (main heating system 1)												
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(210)
Space heating fuel (main heating system 1)												
1315.57	887.96	544.14	188.63	31.46	-	-	-	-	259.69	893.52	1315.82	(211)
Appendix Q - monthly energy saved (main heating system 2)												
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(212)
Space heating fuel (main heating system 2)												
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(213)
Appendix Q - monthly energy saved (secondary heating system)												
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(214)
Space heating fuel (secondary)												
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(215)
Water heating												
Water heating requirement												
204.77	179.91	187.58	166.26	161.56	142.39	134.87	150.58	151.12	172.49	184.77	199.21	(64)
Efficiency of water heater												87.60 (216)
89.81	89.71	89.47	88.90	87.98	87.60	87.60	87.60	87.60	89.08	89.70	89.82	(217)
Water heating fuel												
228.01	200.54	209.67	187.03	183.63	162.54	153.96	171.90	172.52	193.64	205.98	221.79	(219)

Annual totals	kWh/year	
Space heating fuel used, main system 1	5436.80	(211)
Space heating fuel (secondary)	0.00	(215)
Water heating fuel	2291.21	(219)
Electricity for pumps, fans and electric keep-hot		
central heating pump	130.00	(230c)
boiler with a fan-assisted flue	45.00	(230e)
Total electricity for the above, kWh/year	175.00	(231)
Electricity for lighting (100.00% fixed LEL)	454.46	(232)
Energy saving/generation technologies		
Appendix Q -		
Energy saved or generated ():	0.000	(236a)
Energy used ():	0.000	(237a)
Total delivered energy for all uses	8357.47	(238)

10a. Fuel costs using Table 12 prices

	kWh/year	Fuel price p/kWh	£/year	
Space heating - main system 1	5436.799	3.100	168.54	(240)
Space heating - main system 2	0.000	0.000	0.00	(241)
Water heating cost	2291.21	3.100	71.03	(247)
Mech vent fans cost	0.000	11.460	0.00	(249)
Pump/fan energy cost	175.000	11.460	20.05	(249)
Energy for lighting	454.458	11.460	52.08	(250)
Additional standing charges			106.00	(251)
Electricity generated - PVs	0.000	0.000	0.00	(252)
Appendix Q -				
Energy saved or generated ():	0.000	0.000	0.00	(253)
Energy used ():	0.000	0.000	0.00	(254)
Total energy cost			417.70	(255)

11a. SAP rating

	0.47	**(256)**
	1.17	**(257)**
SAP value	83.67	
	84	(258)
SAP band	**B**	

12a. Carbon dioxide emissions

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating, main system 1	5436.80	0.198	1076.49	(261)
Space heating, main system 2	0.00	0.000	0.00	(262)
Space heating, secondary	0.00	0.517	0.00	(263)
Water heating	2291.21	0.198	453.66	(264)
Space and water heating			1530.15	(265)
Electricity for pumps and fans	175.00	0.517	90.48	(267)
Electricity for lighting	454.46	0.517	234.96	(268)
Electricity generated - PVs	0.00	0.529	0.00	(269)
Electricity generated - µCHP	0.00	0.000	0.00	(269)
Appendix Q -				
Energy saved ():	0.00	0.000	0.00	(270)
Energy used ():	0.00	0.000	0.00	(271)
Total CO2, kg/year			1855.58	(272)

	kg/m²/year	
CO2 emissions per m²	**15.13**	(273)
EI value	85.17	(273a)
EI rating	**85**	(274)
EI band	**B**	

13a. Primary energy

	Energy kWh/year	Primary factor	P. Energy (kWh/year)	
Space heating, main	5436.80	1.020	5545.54	(261)
Space heating, main system 2	0.00	0.000	0.00	(262)
Space heating, secondary	0.00	2.920	0.00	(263)
Water heating	2291.21	1.020	2337.04	(264)
Space and water heating			7882.57	(265)
Electricity for pumps/fans	175.00	2.920	511.00	(267)
Electricity for lighting	454.46	2.920	1327.02	(268)
Electricity generated - PV	0.00	2.920	0.00	(269)
Electricity generated - µCHP	0.00	0.000	0.00	(269)
Electricity generated - wind	0.00	2.920	0.00	(269)
New energy-saving technology :				
Energy saved ():	0.00	0.000	0.00	(270)
Energy used ():	0.00	0.000	0.00	(271)
Primary energy kWh/year			**9720.59**	(272)
Primary energy kWh/m²/year			**79.24**	(273)

Project Information

Building type	Detached house		
Reference	Plot 235 type SR18.3		
Date	17 August 2025		
Client	Lagan Homes (Millmount) Ltd 19 Claredon Road Belfast BT1 3BG	Project	14 Millmount Village Green DUNDONALD BT16 1AW

REGULATION COMPLIANCE REPORT - Technical Booklet F1, October 2012
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New dwelling as built

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1 TER and DER

Fuel for main heating system: Gas (mains) (fuel factor = 1.00)

Target Carbon Dioxide Emission Rate	TER = 20.13	
Dwelling Carbon Dioxide Emission Rate	DER = 16.41	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

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4 Fabric U-values

Element	Average	Highest	
Wall	0.20 (max. 0.30)	0.20 (max. 0.70)	OK
Floor	0.11 (max. 0.25)	0.11 (max. 0.70)	OK
Roof	0.11 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.23 (max. 2.00)	1.50 (max. 3.30)	OK

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5 Air permeability

Air permeability at 50 pascals:	5.30	OK

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6 Heating efficiency

Main heating system:

Boiler and radiators, mains gas
Worcester Greenstar 4000

Source of efficiency: from boiler database
Worcester Greenstar 4000 GR4700iW 30 C NG
Efficiency: 90.2% SEDBUK2009
Minimum: 88.0% OK

Secondary heating system:

None -

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7 Cylinder insulation

Hot water storage No cylinder

8 Controls

(Also refer to "Domestic Building Services Compliance Guide" by the DCLG)

Space heating controls	Time and temperature zone control	OK
Hot water controls	No cylinder	
Boiler Interlock	Yes	OK
Hot water controls	No cylinder	

9 Low energy lights

	Percentage of fixed lights with low-energy fittings: 100.0%	
	Minimum: 75.0%	OK

10 Mechanical ventilation

Not applicable

Summertime temperature

Overheating risk (Northern Ireland):		OK
	Not significant	OK

Based on:

Thermal mass parameter :	348.83
Overshading :	Average or unknown (20-60 % sky blocked)

Orientation : South

Ventilation rate :	4.00
Blinds/curtains :	

None with blinds/shutters closed 0.00% of daylight hours

1b Key features

Double-glazed, argon filled, low-E, En=0.1, soft coat U-value 1.20 W/m²K
Ground floors U-value 0.11 W/m²K
Pitched roofs insulated between joists U-value 0.10 W/m²K
Solid door U-value 1.10 W/m²K

Project Information

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Reference	Plot 235 type SR18.3		
Date	17 August 2025		
Client	Lagan Homes (Millmount) Ltd 19 Claredon Road Belfast BT1 3BG	Project	14 Millmount Village Green DUNDONALD BT16 1AW

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14 Millmount Village Green site 235 type SR18.3 test 3.30+2

14 Millmount Village Green
DUNDONALD
BT16 1AW

Located in:	Northern Ireland		
Region:	Northern Ireland		
Postcode:	BT16 1AW		
UPRN:	UPRN-000187711269		
Date of assessment:	2025-08-17		
Date of certificate:	2025-08-18		
Assessment type:	New dwelling as built		
Tenure:	Unknown		
Transaction type:	New dwelling		
Related party disclosure:	No related party		
Property description			
Dwelling type:	Detached house		
Ground floor (1)	area = 67.64m²	storey height = 2.60m	
First floor	area = 55.03m²	storey height = 2.72m	
Living area:	16.28 (fraction 0.133)		
Front of dwelling faces:	South		
Doors			
Solid door	area = 1.91	U = 1.10	
Full glazed door	area = 3.80	U = 1.50	- Double-glazed, argon filled, low-E, En=0.1, soft coat (North)
Windows			
Window	area = 4.37	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (East)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.60	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)

Project Information

Building type Detached house

Reference Plot 235 type SR18.3
Date 17 August 2025
Client Lagan Homes (Millmount) Ltd
19 Claredon Road
Belfast
BT1 3BG

Project 14 Millmount Village Green
DUNDONALD
BT16 1AW

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Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.90	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 5.45	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.27	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (North)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.27	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (South)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (South)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (East)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (East)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.99	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (South)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.99	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (South)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 0.27	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (South)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (North)
Overshading:	Average or unknown (20-60 % sky blocked)		

Project Information

Building type	Detached house		
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Window	area = 5.07	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.17	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (East)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (East)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.46	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (North)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.26	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)
Overshading:	Average or unknown (20-60 % sky blocked)		
Window	area = 1.26	U = 1.20	- Double-glazed, argon filled, low-E, En=0.1, soft coat (West)
Overshading:	Average or unknown (20-60 % sky blocked)		

Rooflights

Opaque Elements

Roofs	area = 55.03	U = 0.10, k = 9.0
Walls	area = 182.85	U = 0.20, k = 190.0
Ground floors	area = 67.64	U = 0.11, k = 110.0
Roofs	area = 12.61	U = 0.18, k = 9.0

Thermal bridges:	Htb = 30.08		
E1 Steel lintel with perforated steel base plate [T] E1	0.500	0.500	28.185
E10 Eaves (insulation at ceiling level) [T] E10	0.060	0.060	28.530
E14 Flat roof [T] E14	0.000	0.000	9.780
E16 Corner (normal) [T] E16	0.090	0.090	34.230

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E17 Corner (inverted – internal area greater than external area) [T] E17	-0.090	-0.090	7.790
E3 Sill [T] E3	0.040	0.040	25.465
E4 Jamb [T] E4	0.050	0.050	48.900
E5 Ground floor (normal) [T] E5	0.160	0.160	39.980
E6 Intermediate floor within a dwelling [T] E6	0.070	0.070	29.110

Thermal mass:	Calculated from k values
Pressure test:	Yes (q50 - 5.30) : measured in this dwelling : No
Ventilation:	Natural ventilation with intermittent extract fans
Number of chimneys:	0
Number of open flues:	0
Number of intermittent fans:	4
Number of passive stacks:	0
Number of sides sheltered:	2.00
Measured/design q50:	3.30
Main heating system:	Central heating systems with radiators or underfloor heating Gas boilers (including LPG) 1998 or later Condensing combi with automatic ignition Index : 18907 Eff 87.60% / 90.20% Worcester Greenstar 4000 GR4700iW 30 C NG Radiators Pump in heated space: Yes Boiler has load or weather compensator: No Boiler Interlock: Yes Design flow temperature : > 45°C Central heating pump pre-2013 Gas (mains)
Main heating controls:	Time and temperature zone control
Boiler has load compensator:	No
Boiler has weather compensator:	No
Boiler has emhanced load compensator:	No

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Boiler interlock:	Yes
Secondary heating system:	None
Water heating:	Combination boiler Combination boiler type : Instantaneous Solar panel: no
Water use <= 125 litres/person/day:	No
Low energy lights:	100.0% of fixed lighting outlets
Total fixed lighting outlets:	13
Electricity tariff:	Standard tariff
Photovoltaics 1:	Peak kW: 0.00
Photovoltaics 2:	Peak kW: 0.00
Photovoltaics 3:	Peak kW: 0.00
Conservatory:	No
Fixed air conditioning:	No
Smoke Control Area:	Not specified

Additional allowable electricity generation : 0.00kg/m²/year

Htb Values

Junction type	Achieved linear thermal transmittance (W/mK)	Detail length (m)	Linear thermal transmittance x Detail length (W/K)
Steel lintel with perforated steel base plate E1 [T]	0.500	28.185	14.092
Eaves (insulation at ceiling level) E10 [T]	0.060	28.530	1.712
Flat roof E14 [T]	0.000	9.780	0.000
Corner (normal) E16 [T]	0.090	34.230	3.081
Corner (inverted – internal area greater than external area) E17 [T]	-0.090	7.790	-0.701
Sill E3 [T]	0.040	25.465	1.019
Jamb E4 [T]	0.050	48.900	2.445
Ground floor (normal) E5 [T]	0.160	39.980	6.397
Intermediate floor within a dwelling E6 [T]	0.070	29.110	2.038
		Running Total:	30.082