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PROPOSED STRATEGIC
HOUSING RESIDENTIAL DEVELOPMENT
AT SION ROAD.
CO. KILKENNY
FOR TORCA DEVELOPMENTS.
LTD.

RESIDENTIAL ENERGY STATEMENT

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1. Introduction

The purpose of this Energy Statement is to provide a report on the energy performance and sustainability of a proposed residential development at SION ROAD. CO. KILKENNY. It outlines how the construction and performance of the proposed development will meet or exceed legislative and planning requirements, with particular emphasis on meeting the upcoming Nearly Zero Energy Buildings standards. The report is intended as part of the Strategic Housing Development Application for the above development.

1.1 Compliance Standards

The report will review the proposed development in terms of:

- The Building Regulations 1997-2017, specifically Part L (Conservation of Fuel and Energy – Dwellings) in terms of Technical Guidance Document L;
- The upcoming changes to Part L, to include the Nearly Zero Energy Buildings standards; and
- Building Energy Rating in terms of the Sustainable Energy Authority of Ireland requirements and the Dwelling Energy Assessment Procedure methodology.

The assessments herein are based on the drawings and design information current at the date of this report and are subject to change pending Planning outcomes and detailed design. Please refer to the drawings and documents accompanying the Strategic Housing Development Application.

1.1.1 Abbreviations and Terms Used in this Report

TGD L	Technical Guidance Document L
NZEB	Nearly Zero Energy Buildings
BER	Building Energy Rating
DEAP	Dwelling Energy Assessment Procedure
CPC	Carbon Performance Coefficient
MPCPC	Maximum Permitted Carbon Performance Coefficient
EPC	Energy Performance Coefficient
MPEPC	Maximum Permitted Energy Performance Coefficient

1.2 Development Summary

The proposed residential development comprises:

	ACCOMMODATION PROVISION	% SPLIT
01 NO.	5 BEDROOM HOUSES	0.83 %
13 NO.	4 BEDROOM HOUSES	10.83 %
22 NO.	3 BEDROOM HOUSES	18.33 %
31 NO.	3 BEDROOM DUPLEX	25.84 %
6 NO.	2 BEDROOM DUPLEX	5.00 %
36 NO.	1 BEDROOM APARTMENTS	30.00 %
11 NO.	2 BEDROOM APARTMENTS	9.17 %
120 NO	TOTAL RESIDENTIAL UNITS	100 %

Please refer to the drawings and documents accompanying the Strategic Housing Development Application for further details, e.g. the area schedule and residential quality audit.

2. Legislative and Planning Requirements

2.1 Part L

In this document, Part L of the Building Regulations will be referred to in terms of TGD L. TGD L stipulates the requirements on:

- Building geometry factors;
- Building fabric performance;
- Air permeability;
- External environment factors;
- Primary energy use;
- Carbon dioxide emissions; and
- The use of renewable energy.

The method for assessing the building's performance in relation to these standards is DEAP, the national standard for domestic Building Energy Rating.

2.1.1 Limits for CO₂ Emissions and Primary Energy Use

Under Part L currently, the limits for CO₂ emissions (MPCPC) and Primary Energy Use (MPEPC) are:

Current Part L		For NZEB	
MPCPC	0.46	MPCPC	0.35
MPEPC	0.40	MPEPC	0.30

Due to the expected timeframe for the proposed construction, and in the interest of sustainability, this report will assess compliance with the anticipated NZEB requirements rather than the current standards for MPCPC and MPEPC.

2.1.2 Building Fabric

The current maximum area-weighted elemental U-values in TGD L are:

Element	U-value (W/m ² .K)
Pitched Roof (insulated on slope or ceiling)	0.16
Flat Roof	0.20
Walls	0.21
Ground Floor	0.21
Ground Floor with Underfloor Heating	0.15
Exposed Floor	0.21
External doors, windows and roof windows	1.60*

* Applies where the combined area equals 25% of the building floor area. Variations up and down are permissible under 1.3.2.4 and Table 2 of TGD L.

New maximum area-weighted elemental U-values anticipated in the upcoming Part L changes are:

Element	U-value (W/m ² .K)
Walls	0.18
Ground Floor	0.18
External doors, windows and roof windows	1.40

In order to achieve the NZEB standards, in most cases the above standards will be exceeded in the proposed development.

New limits for overheating via glazing are anticipated in the upcoming Part L, the details of which are to be ascertained. However, very large glazed areas are avoided in the proposed scheme in order to avoid excessive heat loss and excessive solar gain, with the associated glare and comfort issues.

2.1.3 Building Fabric – Air Permeability

The current requirement is a maximum air permeability of $7\text{m}^3/\text{hr.m}^2$. The expected maximum in the upcoming changes for NZEB is $5\text{m}^3/\text{hr.m}^2$.

In this report, the dwellings will be assessed in relation to a lower rate of $5\text{m}^3/\text{hr.m}^2$, in line with the NZEB requirement and being a realistic target.

2.1.4 Renewable Energy Contribution

Under TGD L currently, the required contributions by renewable energy technologies are:

- 10 kWh/m²/annum contributing to energy use for domestic hot water heating, space heating or cooling; or
- 4 kWh/m²/annum of electrical energy; or
- A combination of these which would have equivalent effect.

The level anticipated in the upcoming TGD L is:

- A minimum of 20% of a dwelling's primary energy use shall come from renewable sources.

Due to the expected timeframe for the proposed construction, and in the interest of sustainability, this report will assess compliance with the anticipated NZEB requirement of 20% in addition to compliance with the current standards.

3. Test Cases

3.1 Methodology

The method of case-testing was as follows:

- A number of typical unit types and scenarios were selected, with best-case scenarios deliberately omitted to avoid misleading results;
- Taking viability and buildability into account, various configurations of fabric and systems were input and assessed through DEAP; and
- Reports were produced summarising optimal configurations.

3.2 Test Case Inputs

3.2.1 Geometry and External Environment

To avoid misleading outputs and ensure compliance throughout, the typical unit types and Configurations were selected avoiding “ideal” conditions, whether they were conditions of the external environment or interior configuration.

The units were designed to allow variation in aspect and orientation, with the apartments for example being predominantly dual-aspect, allowing flexibility in the proportions of glazing.

3.2.2 Ventilation

Considering flexibility for potential occupants, the option of natural ventilation was used in the calculations. Mechanical ventilation with heat recovery, for example, would therefore be an improvement option for an already compliant dwelling.

Mechanical extract fans in the kitchens, utility rooms and sanitary spaces are proposed.

There are no open chimneys proposed.

PLEASE NOTE: if air tightness test results of less than $5\text{m}^3/\text{hr}/\text{m}^2$ are achieved the ventilation requirement must be increased by 40%

3.2.3 Air Permeability

An input of $5\text{m}^3/\text{hr}.\text{m}^2$ was used in anticipation of NZEB.

3.2.4 Building elements

A summary of the typical build-ups and U-values used:

Element	U-value (W/m ² .K)	
Ground Floor	0.12	(NZEB 0.18)
Roof (insulated on slope or ceiling)	0.12	(NZEB 0.16)
Walls	0.15	(NZEB 0.18)
External Doors	0.90	(NZEB 1.40)
External Windows	0.90	(NZEB 1.40)
Roof Windows	1.30	(NZEB 1.40)

These U-values are in anticipation of the upcoming Part L changes and NZEB.

U-value ranges are shown in some instances – please refer to individual reports for specific U-values.

3.2.4.1 Thermal Bridging Factor

The default Thermal Bridging Factor of 0.08 for Acceptable Construction Details under the current TGD L is used. If a lower factor or thermal modelling is required by forthcoming changes, the rating will improve – the results of this assessment would therefore remain valid.

3.2.5 Space and Water Heating

An air-to-water heat pump system is proposed for each dwelling as the optimal balance of practicality, efficiency and contribution of renewable energy. Each heat pump system shall be listed on the HARP database or have IS EN14825, IS EN 16147 or Eco Design test certificates (or otherwise as required by changes to the Regulations).

The hot water storage will form part of the composite heat-pump systems, with certified loss factors. The Season Performance for Hot Water generation must not be less than 250%

Space heat distribution will be via low-temperature radiators generally, and the space and hot water system will have full time and temperature controls. The seasonal performance of the heat pump must not be less than 560%

No secondary heating system, e.g. fireplace or stove, is proposed.

3.2.6 Low Energy Lighting

Each dwelling shall have 100% dedicated low-energy fittings or low-energy bulbs.

3.2.7 Thermal Mass

The construction – block/concrete with some timber or metal stud partitions – is expected to have a medium average thermal mass. Low mass loses heat quickly but high mass is not best suited to the temperate Irish climate with its relatively low variation of day to night temperatures. Therefore, the range of medium-low to medium-high is the most appropriate for this climate.

3.3 Case Study Inputs and Outputs Summaries

3.3.1 Inputs Summary

Ventilation	Natural	
Air Permeability	5m ³ /hr.m ²	
U-values	Ground Floor	0.12 150mm insulation at 0.022 W/mK
	Pitched Roof	0.12 400mm insulation at 0.044 W/mK
	Walls	0.15 110mm part-fill insulation at 0.020 W/mK
	Exposed Floor	0.17 400mm insulation at 0.044 W/mK + 25mm insulation at 0.022 W/mK
	External Doors	0.9
	External Windows	0.9
	Roof Windows	1.3
Thermal Bridging Factor	0.08	
Space and Water Heating	Air-to-water heat pump with low-temperature radiators	
	No secondary heating	
Lighting	100% low-energy	

3.3.2 Outputs Summary

3.3.2.1 Example 1

House	Energy Rating	CPC	EPC	Renewables %
Unit No. 21 Semi-detached	A2 39.10 kWh/m2/yr	0.263	0.275	45%

- Meets anticipated revised Part L/NZEB U-value standards
- Meets anticipated revised Part L/NZEB MPCPC and MPEPC standards
- Meets anticipated revised Part L/NZEB renewables standards

3.3.2.2 Example 2

House	Energy Rating	CPC	EPC	Renewables %
Unit No. 90 Mid Terrace	A2 37.93 kWh/m2/yr	0.264	0.274	42%

- Meets anticipated revised Part L/NZEB U-value standards
- Meets anticipated revised Part L/NZEB MPCPC and MPEPC standards
- Meets anticipated revised Part L/NZEB renewables standards

3.3.2.3 Example 3

House	Energy Rating	CPC	EPC	Renewables %
Unit No. 61 Apartment	A2 46.58 kWh/m ² /yr	0.251	0.260	43%

- Meets anticipated revised Part L/NZEB U-value standards
- Meets anticipated revised Part L/NZEB MPCPC and MPEPC standards
- Meets anticipated revised Part L/NZEB renewables standards

3.3.2.4 Example 4

House	Energy Rating	CPC	EPC	Renewables %
Unit No. 62 Duplex	A2 38.00 kWh/m ² /yr	0.272	0.281	40%

- Meets anticipated revised Part L/NZEB U-value standards
- Meets anticipated revised Part L/NZEB MPCPC and MPEPC standards
- Meets anticipated revised Part L/NZEB renewables standards

4. Conclusions

The proposed dwellings will comply with the existing requirements of Part L and the envisaged changes to Part L including NZEB with sufficient leeway to accommodate changes not detailed at this time, and with opportunities for individual owners to add further energy-saving or renewable-energy measures, e.g. heat-recovery systems and additional photovoltaic or solar thermal panels.

5. Appendix – Case Study Reports

5.1 Example 1- Unit 21

Property Details			
Dwelling Type	Semi-detached house	Type Of BER Rating	New Dwelling - Provisional
Address line 1	SION ROAD	Year of Construction	2019
Address line 2		Date of Assessment	28/05/2019
Address line 3		Date of Plans	28/05/2019
County	Co. Kilkenny	Planning Reference	
Post Code		Building Regulations	2011 TGD L
Has a rating been previously submitted?	No	Is MPRN shared with another dwelling?	No
BER Number		MPRN No.	
Purpose of rating	New dwelling for owner occupation		
Comment	Unit 21 SEMI DETACHED		
Client Name	TORCA DEVELOPMENTS	Client Phone	
Address line 1	SION ROAD	Client Email	
Address line 2		Assessor Name	Jeff O'Toole
Address line 3		Assessor Reg No.	105820
County	Co. Kilkenny	Developer Name	
Post Code		Development Name	
DIMENSION DETAILS			
	Area [m²]	Height [m]	Volume [m³]
Ground Floor	69.04	2.93	202.29
First Floor	61.95	2.40	148.68
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	130.99		350.97
Living Area [m²]	15.75	Living area percentage [%]	12.02
No of Storeys	2		

VENTILATION DETAILS				
	Number			
Chimneys	0	Has a permeability test been carried out?		Yes
Open Flues	0	Result of air permeability test in ac/h		0.250
Fans & Vents	4	Is there a suspended wooden ground floor?		
Number of flueless combustion room heaters	0	Percentage windows/doors draughtstripped [%]		
Is there a draught lobby on main entrance?	No	Number of sides sheltered		1
Ventilation method		Natural ventilation		
Specific fan power [W/(L/s)]		Not Applicable		
Heat exchanger efficiency [%]		Not Applicable		
Mechanical Ventilation Manufacturer		Not Applicable		
Mechanical Ventilation Model Name		Not Applicable		
How many wetrooms (incl. kitchen)? Is the vent. ducting flexible/rigid/both?				
BUILDING ELEMENTS - Floor Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	Underfloor heating
Ground Floor - Solid		0.120	69.040	No
BUILDING ELEMENTS - Roof Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	
Pitched Roof – Insulated on Ceiling		0.120	69.040	
BUILDING ELEMENTS - Wall Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	
300mm Cavity		0.150	96.100	
BUILDING ELEMENTS - Door Details				
Description	Number of Doors	U-Value [W/m ² K]	Area [m ²]	
	1	0.900	3.105	
BUILDING ELEMENTS - Window Details				
Glazing type	User defined u-value	U-Value [W/m ² K]	Area [m ²]	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	9.310	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	9.960	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	1.920	
OTHER DETAILS				

Thermal bridging factor [W/m ² k]	0.0800	Thermal mass category of dwelling	Medium
Low Energy Lighting [%]			100

HEATING SYSTEM - Solar Water Heating			
Solar Water Heating Present?	No	Aperture area of solar collector [m ²]	n/a
Type, manufacturer, model	n/a		
Zero loss collector efficiency, η_0	n/a	Collector heat loss coefficient, a_1 [W/m ² K]	n/a
Annual Solar Radiation [kWh/m ²] (Refer to Appendix H in DEAP)	n/a	Overshading factor	n/a
Dedicated storage volume [Litres]	n/a	Combined Cylinder	n/a
Solar fraction [%]	0		

HEATING SYSTEM - Hot Water System			
Distribution Losses	Yes	Combi boiler present?	No
Supplementary electric water heating	No	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	DAIKIN ERGA06DV3	Declared loss factor [kWh/d]	1.150
Temperature factor unadjusted (table 2 in DEAP)	0.89	Temperature factor multiplier (table 2 in DEAP)	0.89
Primary Circuit loss type	Boiler and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system	Yes		

HEATING SYSTEM – Dist. system losses and gains (Table 4 in DEAP)					
Temperature adjustment [°C]	0.000	Control Category	2	Responsiveness category	1
Central heating pumps	1	Oil Boiler Pump	0	Oil boiler pump inside dwelling	No
Gas boiler flue fan	0	Warm air heating or fan coil radiators present			No

HEATING SYSTEM – Energy Requirements (Individual)					
Main space heating system efficiency [%]	505.00	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.00	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	0.00	Fraction of heating from secondary heating system	0.00	Secondary space heating system fuel	None

Fraction of main space and water heat from CHP	0.00	Electrical efficiency of CHP	0.00	Heat efficiency of CHP	0.00
CHP Fuel type	None				

SUMMARY FOR PART L CONFORMANCE (Applies to TGD L 2008/2011 for new dwellings only)

BER Number		Building Regulations	2011 TGD L
BER Result	A2	Energy Value kWh/m ² /yr	39.10
CO2 emissions [kg/m ² /yr]	7.69	Total compliance with Part L in DEAP?	Pass
EPC	0.275	EPC Pass/Fail	Pass
CPC	0.263	CPC Pass/Fail	Pass

PART L CONFORMANCE - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m ² K]	Pass / Fail	Conformity with Maximum U-value requirements	U-Value [W/m ² K]	Pass / Fail
Pitched roof insulated on ceiling	0.12	Pass	Roofs	0.12	Pass
Pitched roof insulated on slope	0.00	Pass	Walls	0.15	Pass
Flat Roof	0.00	Pass	Floors	0.12	Pass
Floors with no underfloor heat	0.12	Pass	External doors / windows / rooflights	0.90	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	18.5	Pass			
Average U value of openings	0.90				
Permeability test carried out and meets guidelines in TGD L					

PART L CONFORMANCE – Renewables (individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m ² /y]
Solar water heating system	0.00	0.00
Heat pump as main space heating system	1634.43	12.48
Heat pump as secondary space heating system	0.00	0.00
Heat pump as main water heating system	23.66	0.18
Wood/Biomass heater as main space heating system	0.00	0.00
Wood/Biomass heater as secondary heating system	0.00	0.00
Wood/Biomass heater as main water heating system	0.00	0.00
Contribution from CHP	0.00	0.00

HEAT PUMP	670.73	5.12
	0.00	0.00
	0.00	0.00
Total thermal	2328.82	17.78
Total electrical	0.00	0.00
Total thermal equivalent	2328.82	17.78
Does total thermal equivalent meet part L requirement?	Pass	

5.2 Example 2 - Unit 90

Property Details			
Dwelling Type	Mid-terrace house	Type of BER Rating	New Dwelling - Provisional
Address line 1	SION ROAD	Year of Construction	2019
Address line 2		Date of Assessment	28/05/2019
Address line 3		Date of Plans	28/05/2019
County	Co. Kilkenny	Planning Reference	
Post Code		Building Regulations	2011 TGD L
Has a rating been previously submitted?	No	Is MPRN shared with another dwelling?	No
BER Number		MPRN No.	
Purpose of rating	New dwelling for owner occupation		
Comment	Unit 90 MID TERRACE		
Client Name	TORCA DEVELOPMENTS	Client Phone	
Address line 1	SION ROAD	Client Email	
Address line 2		Assessor Name	Jeff O'Toole
Address line 3		Assessor Reg No.	105820
County	Co. Kilkenny	Developer Name	
Post Code		Development Name	
DIMENSION DETAILS			
	Area [m²]	Height [m]	Volume [m³]
Ground Floor	57.87	2.70	156.25
First Floor	55.36	2.75	152.24
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	113.23		308.49
Living Area [m²]	18.65	Living area percentage [%]	16.47
No of Storeys	2		

VENTILATION DETAILS				
	Number			
Chimneys	0	Has a permeability test been carried out?		Yes
Open Flues	0	Result of air permeability test in ac/h		0.250
Fans & Vents	4	Is there a suspended wooden ground floor?		
Number of flueless combustion room heaters	0	Percentage windows/doors draughtstripped [%]		
Is there a draught lobby on main entrance?	No	Number of sides sheltered		2
Ventilation method		Natural ventilation		
Specific fan power [W/(L/s)]		Not Applicable		
Heat exchanger efficiency [%]		Not Applicable		
Mechanical Ventilation Manufacturer		Not Applicable		
Mechanical Ventilation Model Name		Not Applicable		
How many wetrooms (incl. kitchen)? Is the vent. ducting flexible/rigid/both?				
BUILDING ELEMENTS - Floor Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	Underfloor heating
Ground Floor - Solid		0.120	57.870	No
BUILDING ELEMENTS - Roof Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	
Pitched Roof – Insulated on Ceiling		0.120	57.870	
BUILDING ELEMENTS - Wall Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	
300mm Cavity		0.150	46.750	
BUILDING ELEMENTS - Door Details				
Description	Number of Doors	U-Value [W/m ² K]	Area [m ²]	
	1	0.900	2.100	
BUILDING ELEMENTS - Window Details				
Glazing type	User defined u-value	U-Value [W/m ² K]	Area [m ²]	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	10.229	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	9.260	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	0.990	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	0.990	

OTHER DETAILS

Thermal bridging factor [W/m ² k]	0.0800	Thermal mass category of dwelling	Medium
Low Energy Lighting [%]			100

HEATING SYSTEM - Solar Water Heating

Solar Water Heating Present?	No	Aperture area of solar collector [m ²]	n/a
Type, manufacturer, model	n/a		
Zero loss collector efficiency, η_0	n/a	Collector heat loss coefficient, a1 [W/m ² K]	n/a
Annual Solar Radiation [kWh/m ²] (Refer to Appendix H in DEAP)	n/a	Overshading factor	n/a
Dedicated storage volume [Litres]	n/a	Combined Cylinder	n/a
Solar fraction [%]	0		

HEATING SYSTEM - Hot Water System

Distribution Losses	Yes	Combi boiler present?	No
Supplementary electric water heating	No	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	DAIKIN ERGA06DV3	Declared loss factor [kWh/d]	1.150
Temperature factor unadjusted (table 2 in DEAP)	0.89	Temperature factor multiplier (table 2 in DEAP)	0.89
Primary Circuit loss type	Boiler and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system	Yes		

HEATING SYSTEM – Dist. system losses and gains (Table 4 in DEAP)

Temperature adjustment [°C]	0.000	Control Category	2	Responsiveness category	1
Central heating pumps	1	Oil Boiler Pump	0	Oil boiler pump inside dwelling	No
Gas boiler flue fan	0	Warm air heating or fan coil radiators present			No

HEATING SYSTEM – Energy Requirements (Individual)

Main space heating system efficiency [%]	522.00	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.00	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity

Secondary heating system efficiency [%]	0.00	Fraction of heating from secondary heating system	0.00	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	0.00	Electrical efficiency of CHP	0.00	Heat efficiency of CHP	0.00
CHP Fuel type	None				

SUMMARY FOR PART L CONFORMANCE (Applies to TGD L 2008/2011 for new dwellings only)

BER Number		Building Regulations	2011 TGD L
BER Result	A2	Energy Value kWh/m ² /yr	37.93
CO2 emissions [kg/m ² /yr]	7.46	Total compliance with Part L in DEAP?	Pass
EPC	0.274	EPC Pass/Fail	Pass
CPC	0.264	CPC Pass/Fail	Pass

PART L CONFORMANCE - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m ² K]	Pass / Fail	Conformity with Maximum U-value requirements	U-Value [W/m ² K]	Pass / Fail
Pitched roof insulated on ceiling	0.12	Pass	Roofs	0.12	Pass
Pitched roof insulated on slope	0.00	Pass	Walls	0.15	Pass
Flat Roof	0.00	Pass	Floors	0.12	Pass
Floors with no underfloor heat	0.12	Pass	External doors / windows / rooflights	0.90	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	20.8	Pass			
Average U value of openings	0.90				
Permeability test carried out and meets guidelines in TGD L					

PART L CONFORMANCE – Renewables (individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m ² /y]
Solar water heating system	0.00	0.00
Heat pump as main space heating system	1181.43	10.43
Heat pump as secondary space heating system	0.00	0.00
Heat pump as main water heating system	21.77	0.19
Wood/Biomass heater as main space heating system	0.00	0.00
Wood/Biomass heater as secondary heating system	0.00	0.00

Wood/Biomass heater as main water heating system	0.00	0.00
Contribution from CHP	0.00	0.00
HEAT PUMP	617.17	5.45
	0.00	0.00
	0.00	0.00
Total thermal	1820.36	16.08
Total electrical	0.00	0.00
Total thermal equivalent	1820.36	16.08
Does total thermal equivalent meet part L requirement?	Pass	

5.3 Example 3 - Unit 61

Property Details			
Dwelling Type	Ground-floor apartment	Type of BER Rating	New Dwelling - Provisional
Address line 1	SION ROAD	Year of Construction	2019
Address line 2		Date of Assessment	28/05/2019
Address line 3		Date of Plans	28/05/2019
County	Co. Kilkenny	Planning Reference	
Post Code		Building Regulations	2011 TGD L
Has a rating been previously submitted?	No	Is MPRN shared with another dwelling?	No
BER Number		MPRN No.	
Purpose of rating	New dwelling for owner occupation		
Comment	Unit 61 - APT 03		
Client Name	TORCA DEVELOPMENTS	Client Phone	
Address line 1	SION ROAD	Client Email	
Address line 2		Assessor Name	Jeff O'Toole
Address line 3		Assessor Reg No.	105820
County	Co. Kilkenny	Developer Name	
Post Code		Development Name	
DIMENSION DETAILS			
	Area [m²]	Height [m]	Volume [m³]
Ground Floor	54.79	2.64	144.65
First Floor	0.00	0.00	0.00
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	54.79		144.65
Living Area [m²]	35.67	Living area percentage [%]	65.10
No of Storeys	1		

VENTILATION DETAILS				
	Number			
Chimneys	0	Has a permeability test been carried out?		Yes
Open Flues	0	Result of air permeability test in ac/h		0.250
Fans & Vents	2	Is there a suspended wooden ground floor?		
Number of flueless combustion room heaters	0	Percentage windows/doors draughtstripped [%]		
Is there a draught lobby on main entrance?	No	Number of sides sheltered		2
Ventilation method		Natural ventilation		
Specific fan power [W/(L/s)]		Not Applicable		
Heat exchanger efficiency [%]		Not Applicable		
Mechanical Ventilation Manufacturer		Not Applicable		
Mechanical Ventilation Model Name		Not Applicable		
How many wetrooms (incl. kitchen)? Is the vent. ducting flexible/rigid/both?				
BUILDING ELEMENTS - Floor Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	Underfloor heating
Ground Floor - Solid		0.120	54.790	No
BUILDING ELEMENTS - Roof Details				
BUILDING ELEMENTS - Wall Details				
Type	Description	U-Value [W/m ² K]	Area [m ²]	
300mm Cavity		0.150	21.230	
BUILDING ELEMENTS - Door Details				
Description	Number of Doors	U-Value [W/m ² K]	Area [m ²]	
	1	0.900	2.400	
BUILDING ELEMENTS - Window Details				
Glazing type	User defined u-value	U-Value [W/m ² K]	Area [m ²]	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	4.120	
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	7.200	
OTHER DETAILS				
Thermal bridging factor [W/m ² k]	0.0800	Thermal mass category of dwelling		Medium
Low Energy Lighting [%]				100

HEATING SYSTEM - Solar Water Heating					
Solar Water Heating Present?		No	Aperture area of solar collector [m ²]		n/a
Type, manufacturer, model	n/a				
Zero loss collector efficiency, η_0		n/a	Collector heat loss coefficient, a_1 [W/m ² K]		n/a
Annual Solar Radiation [kWh/m ²] (Refer to Appendix H in DEAP)		n/a	Overshading factor		n/a
Dedicated storage volume [Litres]		n/a	Combined Cylinder		n/a
Solar fraction [%]		0			
HEATING SYSTEM - Hot Water System					
Distribution Losses		Yes	Combi boiler present?		No
Supplementary electric water heating		No	Water Storage Volume [L]		180
Hot water storage manufacturer and model name		DAIKIN ERGA04DV3	Declared loss factor [kWh/d]		1.150
Temperature factor unadjusted (table 2 in DEAP)		0.89	Temperature factor multiplier (table 2 in DEAP)		0.89
Primary Circuit loss type	Boiler and thermal store within a single casing (cylinder thermostat present)				
Is hot water storage indoors or in group heating system		Yes			
HEATING SYSTEM – Dist. system losses and gains (Table 4 in DEAP)					
Temperature adjustment [°C]	0.000	Control Category	2	Responsiveness category	1
Central heating pumps	1	Oil Boiler Pump	0	Oil boiler pump inside dwelling	No
Gas boiler flue fan	0	Warm air heating or fan coil radiators present			No
HEATING SYSTEM – Energy Requirements (Individual)					
Main space heating system efficiency [%]	562.00	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.00	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	0.00	Fraction of heating from secondary heating system	0.00	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	0.00	Electrical efficiency of CHP	0.00	Heat efficiency of CHP	0.00
CHP Fuel type	None				

SUMMARY FOR PART L CONFORMANCE (Applies to TGD L 2008/2011 for new dwellings only)					
BER Number		Building Regulations	2011 TGD L		
BER Result	A2	Energy Value kWh/m ² /yr	46.68		
CO2 emissions [kg/m ² /yr]	9.18	Total compliance with Part L in DEAP?	Pass		
EPC	0.260	EPC Pass/Fail	Pass		
CPC	0.251	CPC Pass/Fail	Pass		
PART L CONFORMANCE - Fabric					
Conformity with Maximum avg U-value requirements	U-value [W/m ² K]	Pass / Fail	Conformity with Maximum U-value requirements	U-Value [W/m ² K]	Pass / Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0.00	Pass
Pitched roof insulated on slope	0.00	Pass	Walls	0.15	Pass
Flat Roof	0.00	Pass	Floors	0.12	Pass
Floors with no underfloor heat	0.12	Pass	External doors / windows / rooflights	0.90	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	25.0	Pass			
Average U value of openings	0.90				
Permeability test carried out and meets guidelines in TGD L					
PART L CONFORMANCE – Renewables (individual heating system)					
Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m ² /y]			
Solar water heating system	0.00	0.00			
Heat pump as main space heating system	660.67	12.06			
Heat pump as secondary space heating system	0.00	0.00			
Heat pump as main water heating system	14.84	0.27			
Wood/Biomass heater as main space heating system	0.00	0.00			
Wood/Biomass heater as secondary heating system	0.00	0.00			
Wood/Biomass heater as main water heating system	0.00	0.00			
Contribution from CHP	0.00	0.00			
HEAT PUMP	420.75	7.68			
	0.00	0.00			
	0.00	0.00			
Total thermal	1096.27	20.01			

Total electrical	0.00	0.00
Total thermal equivalent	1096.27	20.01
Does total thermal equivalent meet part L requirement?	Pass	

5.4 Example 4 - Unit 62

Property Details			
Dwelling Type	Mid-terrace house	Type of BER Rating	New Dwelling - Provisional
Address line 1	SION ROAD	Year of Construction	2019
Address line 2		Date of Assessment	28/05/2019
Address line 3		Date of Plans	28/05/2019
County	Co. Kilkenny	Planning Reference	
Post Code		Building Regulations	2011 TGD L
Has a rating been previously submitted?	No	Is MPRN shared with another dwelling?	No
BER Number		MPRN No.	
Purpose of rating	New dwelling for owner occupation		
Comment	Unit 62 - DUPLEX		
Client Name	TORCA DEVELOPMENTS	Client Phone	
Address line 1	SION ROAD	Client Email	
Address line 2		Assessor Name	Jeff O'Toole
Address line 3		Assessor Reg No.	105820
County	Co. Kilkenny	Developer Name	
Post Code		Development Name	
DIMENSION DETAILS			
	Area [m²]	Height [m]	Volume [m³]
Ground Floor	46.63	2.93	136.63
First Floor	47.06	2.93	137.89
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	93.69		274.51
Living Area [m²]	30.64	Living area percentage [%]	32.70
No of Storeys	2		

VENTILATION DETAILS			
	Number		
Chimneys	0	Has a permeability test been carried out?	Yes
Open Flues	0	Result of air permeability test in ac/h	0.250
Fans & Vents	4	Is there a suspended wooden ground floor?	
Number of flueless combustion room heaters	0	Percentage windows/doors draughtstripped [%]	
Is there a draught lobby on main entrance?	No	Number of sides sheltered	2
Ventilation method		Natural ventilation	
Specific fan power [W/(L/s)]		Not Applicable	
Heat exchanger efficiency [%]		Not Applicable	
Mechanical Ventilation Manufacturer		Not Applicable	
Mechanical Ventilation Model Name		Not Applicable	
How many wetrooms (incl. kitchen)? Is the vent. ducting flexible/rigid/both?			
BUILDING ELEMENTS - Floor Details			
BUILDING ELEMENTS - Roof Details			
Type	Description	U-Value [W/m ² K]	Area [m ²]
Pitched Roof – Insulated on Ceiling		0.120	47.060
BUILDING ELEMENTS - Wall Details			
Type	Description	U-Value [W/m ² K]	Area [m ²]
300mm Cavity		0.150	42.170
BUILDING ELEMENTS - Door Details			
Description	Number of Doors	U-Value [W/m ² K]	Area [m ²]
	1	0.900	2.160
BUILDING ELEMENTS - Window Details			
Glazing type	User defined u-value	U-Value [W/m ² K]	Area [m ²]
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	9.770
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	0.900	5.040
OTHER DETAILS			
Thermal bridging factor [W/m ² k]	0.0800	Thermal mass category of dwelling	Medium
Low Energy Lighting [%]			100

HEATING SYSTEM - Solar Water Heating					
Solar Water Heating Present?		No	Aperture area of solar collector [m ²]		n/a
Type, manufacturer, model	n/a				
Zero loss collector efficiency, η_0		n/a	Collector heat loss coefficient, a_1 [W/m ² K]		n/a
Annual Solar Radiation [kWh/m ²] (Refer to Appendix H in DEAP)		n/a	Overshading factor		n/a
Dedicated storage volume [Litres]		n/a	Combined Cylinder		n/a
Solar fraction [%]		0			
HEATING SYSTEM - Hot Water System					
Distribution Losses		Yes	Combi boiler present?		No
Supplementary electric water heating		No	Water Storage Volume [L]		180
Hot water storage manufacturer and model name		DAIKIN ERGA04DV3	Declared loss factor [kWh/d]		1.150
Temperature factor unadjusted (table 2 in DEAP)		0.60	Temperature factor multiplier (table 2 in DEAP)		0.90
Primary Circuit loss type	Boiler and thermal store within a single casing (cylinder thermostat present)				
Is hot water storage indoors or in group heating system		Yes			
HEATING SYSTEM – Dist. system losses and gains (Table 4 in DEAP)					
Temperature adjustment [°C]	0.000	Control Category	2	Responsiveness category	1
Central heating pumps	1	Oil Boiler Pump	0	Oil boiler pump inside dwelling	No
Gas boiler flue fan	0	Warm air heating or fan coil radiators present			No
HEATING SYSTEM – Energy Requirements (Individual)					
Main space heating system efficiency [%]	530.00	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.00	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	0.00	Fraction of heating from secondary heating system	0.00	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	0.00	Electrical efficiency of CHP	0.00	Heat efficiency of CHP	0.00
CHP Fuel type	Mains Gas				

SUMMARY FOR PART L CONFORMANCE (Applies to TGD L 2008/2011 for new dwellings only)					
BER Number		Building Regulations	2011 TGD L		
BER Result	A2	Energy Value kWh/m ² /yr	38.00		
CO2 emissions [kg/m ² /yr]	7.47	Total compliance with Part L in DEAP?	Pass		
EPC	0.281	EPC Pass/Fail	Pass		
CPC	0.272	CPC Pass/Fail	Pass		
PART L CONFORMANCE - Fabric					
Conformity with Maximum avg U-value requirements	U-value [W/m ² K]	Pass / Fail	Conformity with Maximum U-value requirements	U-Value [W/m ² K]	Pass / Fail
Pitched roof insulated on ceiling	0.12	Pass	Roofs	0.12	Pass
Pitched roof insulated on slope	0.00	Pass	Walls	0.15	Pass
Flat Roof	0.00	Pass	Floors	0.00	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	0.90	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	18.1	Pass			
Average U value of openings	0.90				
Permeability test carried out and meets guidelines in TGD L					
PART L CONFORMANCE – Renewables (individual heating system)					
Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m ² /y]			
Solar water heating system	0.00	0.00			
Heat pump as main space heating system	861.49	9.20			
Heat pump as secondary space heating system	0.00	0.00			
Heat pump as main water heating system	18.73	0.20			
Wood/Biomass heater as main space heating system	0.00	0.00			
Wood/Biomass heater as secondary heating system	0.00	0.00			
Wood/Biomass heater as main water heating system	0.00	0.00			
Contribution from CHP	0.00	0.00			
HEAT PUMP	531.00	5.67			
	0.00	0.00			
	0.00	0.00			
Total thermal	1411.23	15.06			

Total electrical	0.00	0.00
Total thermal equivalent	1411.23	15.06
Does total thermal equivalent meet part L requirement?	Pass	