RESIDENTIAL ENERGY CONSERVATION STRATEGY

LONGVIEW STRATEGIC RESIDENTIAL HOUSING DEVELOPMENT

AT: LAHARDANE & BALLINCOLLY, CORK.

NOVEMBER 2019

Authored by: Paul Horgan — Director Horgan Carroll Architects
Joe Farrelly — MBA Consulting Engineers
Registered Domestic BER Assessor
Registered Commercial BER Assessor

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1.0 Introduction

This Residential Energy Conservation Strategy is provided to set out the Energy Performance of the proposed mixed residential development of 753 residential units at Lahardane & Ballincolly (Townlands), Cork, hereafter referred to as "Longview". The strategy outlines how the method of construction and performance of the proposed development will meet or exceed legislative and planning requirements including:

- NZEB (Bear Zero Energy Building) Compliance.
- Technical Guidance Document Part L – Dwellings 2019
- Cork County Council Development Plan Guidelines.

The Report should be read in conjunction with the Architects Design Statement.

1.1 Compliance Standards

The report will review the proposed development in terms of:

- The Building Regulations 1997-2019, Specifically Part L (Conservation of Fuel & Energy - Dwellings) in terms of Technical Guidance Document Part L 2019.
- The Building Regulations 1997-2019, Specifically Part L (Conservation of Fuel & Energy Buildings other than Dwellings) in terms of Technical Guidance Document Part L 2017.
- Building Energy Rating in terms of the Sustainable Energy Authority of Ireland requirements and the Dwelling Energy Assessment Procedure (DEAP) Methodology.

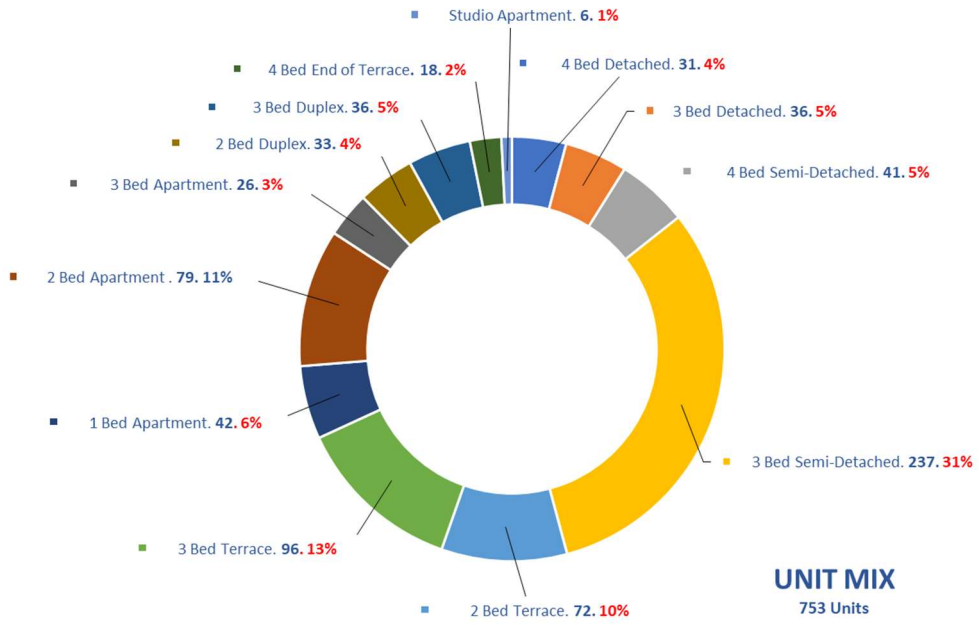
The following assessments are based on the drawings and design information current at the date of this report and are subject to change pending, a positive planning decision, detailed design and revisions to the Building Regulations which may occur over the duration of the construction programme.

This report should be read in conjunction with the drawings and other documentation accompanying this Strategic Housing Development Application.

1.1.1 Abbreviations and Terms Used in this Report

TGD L	Technical Guidance Document Part L 2019
TGD L (Buildings Other Than Dwellings)	Technical Guidance Document Part L 2017
NZEB	Near 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
RER	Renewable Energy Ratio

1.2 Development Summary



This unit mix should be read in conjunction with the drawings and other documentation including The Residential Quality Audit accompanying this Strategic Housing Development Application.

2.0 Legislative and Planning Requirements

2.1 Technical Guidance Document Part L (Dwellings)

In this document, Part L of The Building Regulations will be referred to in Terms of TGD L (Dwellings) & TGD L (Buildings other than dwellings). Criteria assessed within TGD Part L include but are not exclusive to:

- Use of Renewable Energy Sources
- Fabric insulation performance
- Air tightness/ Permeability
- Heat Generation
- Building Services Control
- Insulation of pipes, ducts and vessels.
- Mechanical Ventilation Systems
- Limiting Heat Gains
- Performance of the Completed Dwellings
- External Environmental Factors
- Primary Energy Use
- Carbon Dioxide Emissions
- Para. 0.1.2.2 *Consideration may be given to the future upgrading of the building fabric and fixed services so as to reduce further CO2 emissions associated with the operation and use of the dwelling*

The method for assessing a buildings 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, the maximum permitted limits for CO2 emissions (MPCPC) and Primary Energy Use (MPEPC) are:

MPCPC **0.35**

MPEPC **0.30**

2.1.2 Building Fabric

The current maximum area Weighted elemental U-Values and Average elemental U-Values – Individual element or section of element in TGD L are:

	Weighted elemental U-Value (W/m2K)	Average elemental U-Value (W/m2K)
Pitched Roof (Insulation at ceiling & on slope)	0.16	0.3
Flat Roof	0.20	0.3
Walls	0.18	0.6
Ground Floors	0.18	
Ground (with underfloor heating)	0.15	-
Other exposed floors	0.18	0.6
External doors, windows & rooflights *	1.40	3.0

* Windows, doors and rooflights should have a maximum U-Value of 1.4W/m2k.

It is proposed that Building fabric U-values equal to or improved upon the minimum standards be applied. Such an approach allows for a further reduction in CO2 emissions/ Primary Energy use in the future by the home-owner economically and without interference with the building envelope. i.e. the installation of Photo voltaic solar panels.

2.1.3 Building Fabric – Air Permeability

TGD L, Section 1.3.4.4 recommends that when tested in accordance with procedures set out in sub-section 1.5.4, a performance level of 5 m3/(h.m2) represents a reasonable upper limit for air permeability.

In preparing preliminary DEAP assessments within this report, dwellings have been assessed with an Air-tightness performance of 3.6 m3/(h.m2). It is our experience that an Air Permeability rate of 3.6 m3/(h.m2) is relatively conservative, particularly with prefabricated timber frame construction.

2.1.4 Renewable Energy Contribution

Section 1.2 of TGD L provides guidance on the minimum level of renewable technologies to be provided to show compliance with Regulation 8(b) of the European Union (Energy Performance of Buildings) Regulations 2019. The Renewable Energy Ratio (RER) is the ratio of the primary energy from renewable energy technologies to total primary energy as defined and calculated in DEAP.

Where the MPEPC of 0.3 and MPCPC of 0.35 are achieved, a minimum RER of 0.20 which represents 20% of the primary energy from renewable energy technologies is required.

Sample assessments confirm RER`s ranging between 43% and 60%, exceeding the minimum standards with regard to renewable energy provision. As noted elsewhere there is provision for future improvement of the RER up to 80% with the introduction of Photo voltaic panels by the homeowner.

2.1.5 Planning & Design Guidelines:

- The Cork County Development Plan, Policy Objective HE 4-6, Part B & C refer to energy efficiency as follows:

  b) Promote sustainable approaches to housing development by encouraging new building projects to be energy efficient in their design and layout.

  c) Foster an innovative approach to design that acknowledges the diversity of suitable design solutions in most cases, safeguards the potential for exceptional innovative design in appropriate locations and promotes the added economic, amenity and environmental value of good design.

  The Plan refers to EU Directives in 2002 and 2010 on the Energy Performance of Buildings. The Planning Authority will seek to promote the use of energy efficient methods in the design of new developments.

- Policy objective ED 5-1 Building Energy Efficiency and Conservation seeks to *"Encourage innovative new building design and retrofitting of existing buildings where possible, to improve building energy efficiency, energy conservation and the use of renewable energy sources in accordance with national regulations and policy requirements*".

- The Plan seeks to facilitate the provision of suitable ancillary infrastructure including charge points for electric vehicles and bicycles as per Council standards.

- The Sustainable Residential Development in Urban Areas Guidelines refer to Energy Efficiency in the following terms:

  Passive solar design of new housing schemes contributes to a reduction in energy demand and thus in CO2 emissions. This includes taking maximum advantage of available sunlight, by orientating as many dwellings as possible within 30o of south and by avoiding obstructions which block light reaching windows. The greatest energy savings are achieved when passive solar design principles are also applied to the design of the individual dwelling units

Design, including layout and orientation of individual residential units on the site and within apartment blocks, room layout (with a preference for kitchen/dining & living rooms orientated to the south, easterly or westerly) and the use of balconies for solar shading within apartment blocks have all been considered to maximise energy efficiency and user comfort/ quality of light.

DEAP assessment demonstrate that the proposed dwellings do not have a risk of high internal temperatures as described at Section 1.3.5 Limiting Heat Gains.

An innovative design approach has been followed to ensure generally high-quality living environment`s and compliance with Part L requirements with an emphasis on the thermal envelope. The provision for future improvement of the RER up to 55% with the introduction of Photo voltaic panels by the homeowner also provides a practical method of further improvement.

3.0 Test Cases

3.1 Methodology

The method of case-testing was as follows:

- A number of typical unit types and scenarios have been selected, with avoidance of "ideal" conditions for each house type/ apartment considered.
- Reports have been prepared utilising optimal configurations of fabric and services in association with:
  - Best practice
  - Likelihood of a high-quality outcome through selected construction methods.
  - The availability of qualified tradespersons in the locality.

- Lifespan and maintenance requirements of services & Fabric (Refer to Horgan Carroll Life Cycle Report)
- Minimising carbon footprint of the building envelope/ construction process.
- Efficient deliverability timeline.

3.2 Test Case Inputs

3.2.1 Plan Layout, Passive Gain/loss and External Environment

To a 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.

3.2.2 Building Envelope & Values Applied

With a view to providing compliance with and improving upon Part L / NZEB, the following standards have been applied. DEAP/BER assessments are calculated based on a Timber Frame Construction with plastered block/ Brick outer leaf.

Element	Weighted elemental U-Value (W/m2K)	Indicative Specification
Pitched Roof (Insulation at ceiling & on slope)	0.13	400mm Moy Metac (0.034 W/mk) or similar approved, set between and across the ceiling joist.
Flat Roof	0.18	70mm Thermaroof TR26 (0.022 W/mk) or similar approved warm roof construction – No ventilation required.
Walls*	0.18	Timber frame with 90mm (0.020 W/mk) insulation between studwork & 48mm insulated plasterboard internally
Ground Floor	0.18	100mm Kooltherm K103 (0.018 W/mk) or similar approved
Doors	1.20	Insulated composite door
Windows	1.00	Triple glazed UPVC
Rooflights	1.00	Triple Glazed Low U-Value option

*A Thermal Bridging Factor of 0.08w/m2K has been applied when preparing the sample energy assessments. In accordance with Paragraph 1.3.3.2, Part L, it is reasonable to apply such a value where Acceptable Construction Details for typical constructions as shown in sections 1 to 6 in the document "Limiting Thermal Bridging and Air Infiltration – Acceptable Construction Details" for all key junctions has been applied. Where selected details are designed for improved performance and modelled further improvement may occur at the construction stage.

3.2.3 Space and Water Heating

An Air to Water heat pump (low temperature split system) is proposed to provide space heating and domestic hot water. The proposed and similar alternative systems provide for an insulated and integrated 180 litre stainless steel domestic hot water cylinder. Refer to Diagram 1 below.

The system delivers a constant supply of domestic hot water at an efficiency of circa 252% per unit of electricity and space heating via low temperature radiators at an efficiency of circa 496%. Efficiencies of up to 600% can be achieved in ambient conditions. Refer to Sample Building Energy Ratings / Part L/NZEB compliance reports.

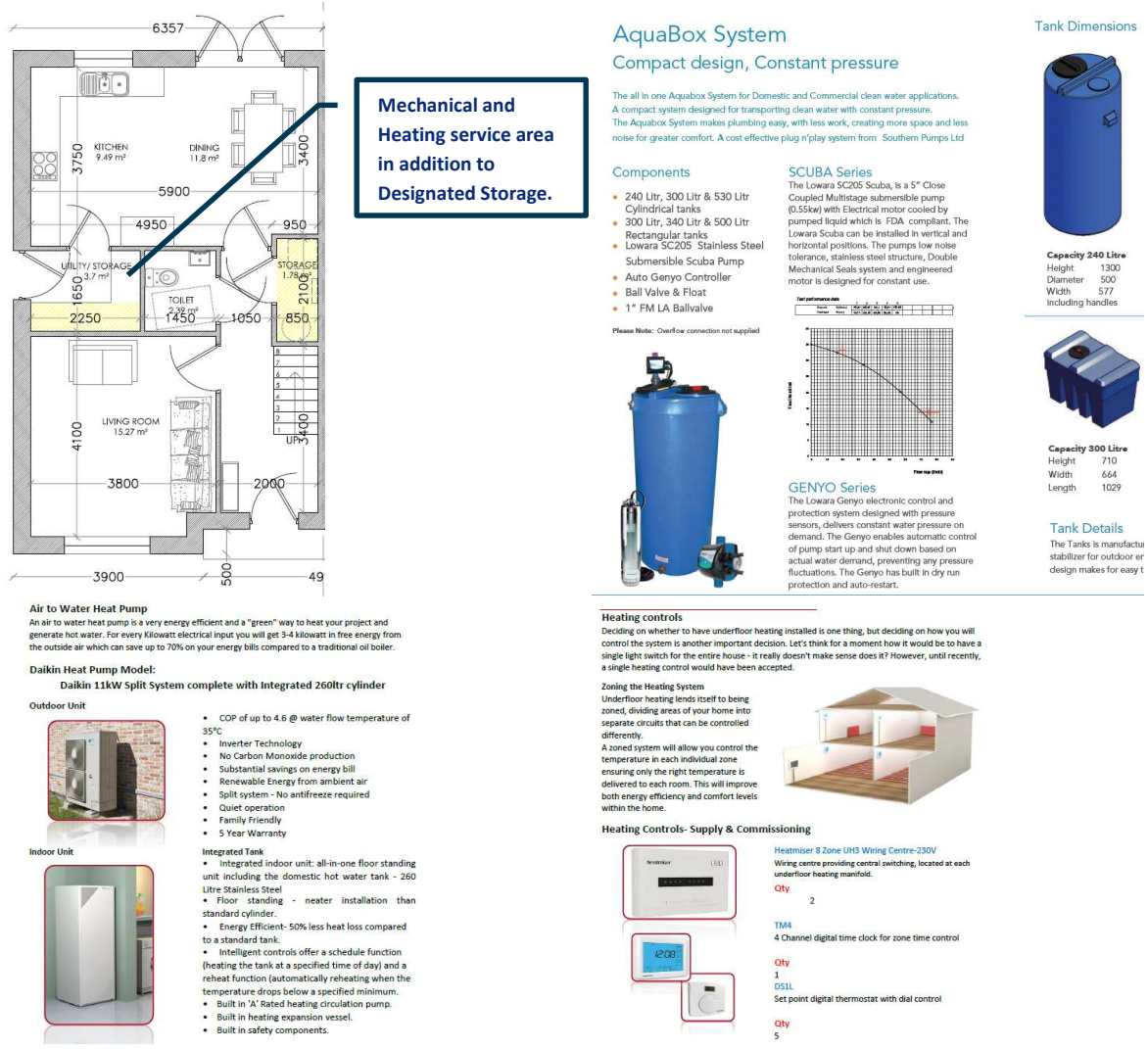


Diagram 1

The proposed residential units, houses and apartments, are designed to include for a designated service area in addition to the minimum designated storage areas as defined under DOE Sustainable Urban Housing; Design Standards for New Apartments – Guidelines for Planning Authorities – March 2018. The reader is referred to Diagram 1, Above.

The integrated indoor unit requires a limited installation footprint, is easily accessible for maintenance with supply and returns connectivity from above and being neat in appearance.

The proposed system utilises a central control clock, digital thermostatic control of heating zones (i.e. Kitchen/Dining/Living Room, Bedrooms, Family Room & Domestic Hot Water) and weather compensation in addition to providing temperature and time control.

The design includes for the provision of an Aqua box (cold water storage tank with a built-in pressure activated submersible pump to ensure that there is good water pressure to all taps and showers). Note: Kitchen taps will have mains water connection.

Apartment blocks at N2 & N6 have been designed to incorporate a mono pitch roof. The roofs are orientated to the south, south east or south west to provide for the potential introduction of photo voltaic roof panels in the future. The void in the mono pitch roof`s also provides a space for the setting of the heat pump condensing units and related venting to air in a design friendly manner, with the individual unit to each apartment hidden from view.

Potential future Improvement and further CO2 reduction.

Renewable energy resulting from the efficiency of the heat pump will provide compliance with Part L / NZEB (RER) requirements. Refer to Sample Building Energy Ratings / Part L/NZEB compliance reports below. The renewable Energy Ratio (RER) for house and apartments on the scheme averages at approximately 40-50%. NZEB requires a minimum RER of 20%.

The provision for future improvement of the RER to between 57% - 79% with the introduction of Photo voltaic panels by the homeowner, provides a practical method of further improvement.

There is the potential that within the proposed infrastructure of each individual house and within Apartment complexes for the future provision of Photo voltaic solar panels. The introduction of the PV would provide for an additional and substantial reduction in external Primary Energy requirements. Refer to Diagram 2.

Diagram 2 – Huse Type 3A potential for the provision of Panels.

Typical PV Panel arrangement

All proposed housing units can accommodate PV panels. Houses on an East-West axis will benefit from increase

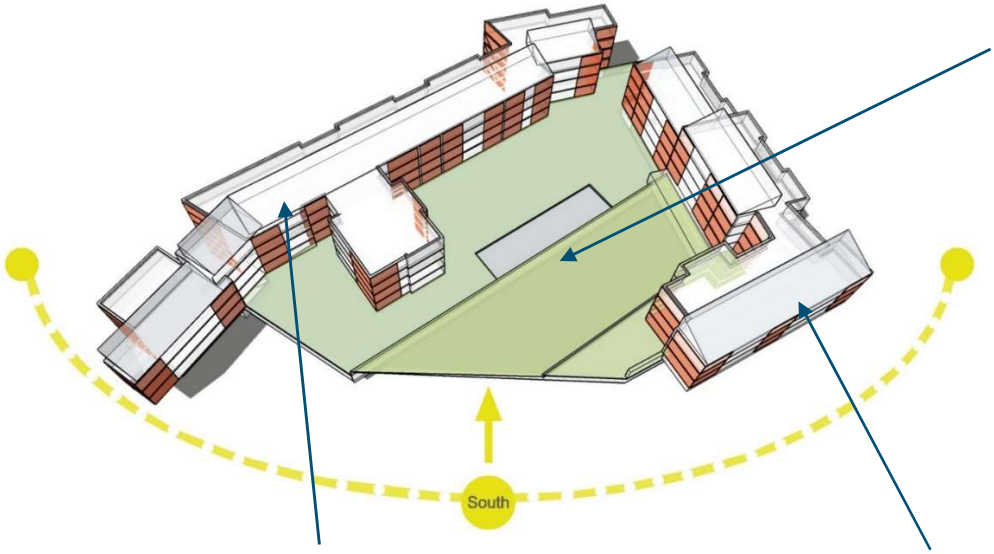


Diagram 3 – N6 Apartments. Central amenity space with southern orientation. The majority of apartment Kitchen/dining/living rooms are orientated to the south, south east and south west & overlook the central amenity space.

Diagram 3 – Option for provision of PV Panels to southerly orientated mono-pitch roofs at N6. Apartment schemes have been designed with south, south west and south easterly facing mono-pitch roofs which are designed to accommodate PV panels and subsidise primary energy requirements.

3.2.4 Ventilation

Whole House Extract Ventilation in compliance with TGD Part F (Ventilation) has been selected when preparing sample DEAP assessments. MEV has been selected with the expectation of low air permeability/ tightness levels and to alleviate the inherent risks of poor-quality air and excessive moisture which may occur when reliant on natural ventilation.

Solid fuel stoves / open fires and associated chimneys are not proposed for the development.

3.2.5 Air Permeability

An Air Permeability value of 3.60m3/hr/m2 @ 50 Pascals has been applied when preparing sample Energy Assessments.

3.2.6 Thermal Mass

DEAP/BER assessments are calculated based on a Timber Frame Construction with plastered block/ Brick outer leaf. Dwellings assessed in timber frame result in a Thermal Massing value of Medium-low. Apartments constructed in a concrete/ steel primary frame with block in-fill and clad externally primarily in brick result in a Thermal Massing value of Medium-High.

Both Medium-low & Medium High are appropriate to the Irish climate which has a limited variation in temperature day to night.

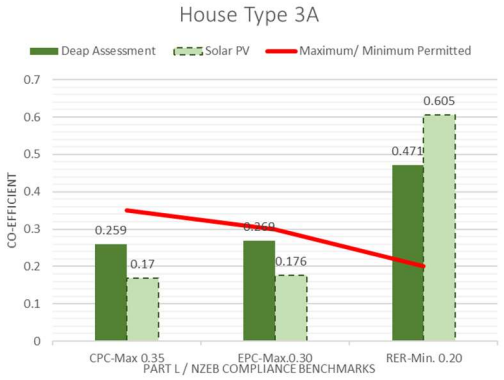
3.2.7 Low Energy Lighting

All dwellings will be provided with low energy fittings or low energy/LED bulbs.

3.3 Case Study Summaries

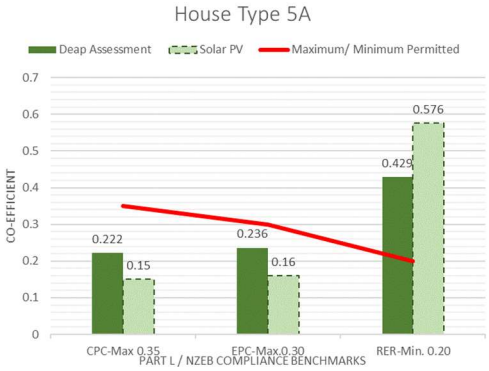
Sample houses have been assessed using the specification summarised above. Resulting Energy Values, Carbon Performance Coefficients (CPC), Energy Performance Coefficients (EPC) and Renewable Energy Ratios (RER) have been graphed below against the relevant maximum/ minimum criteria in solid hatch. Improvements resulting from the future inclusion of Photo voltaic solar panels are shown in a dotted hatch for ease of reference.

3.3.1.1 **House Type 3A – Semi-**detached, 3-bedroom dwelling house.



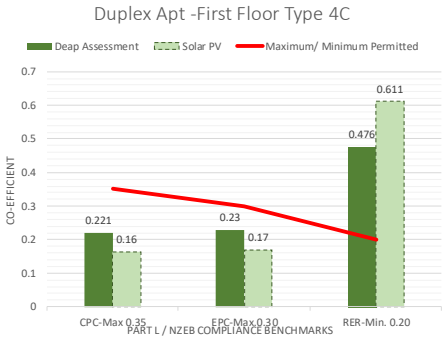
BER Rating A2 - Energy Value 37.50 kWh/m2/yr

3.3.1.2 **House Type 5A -** Detached, 4-bedroom dwelling with room in the roof.



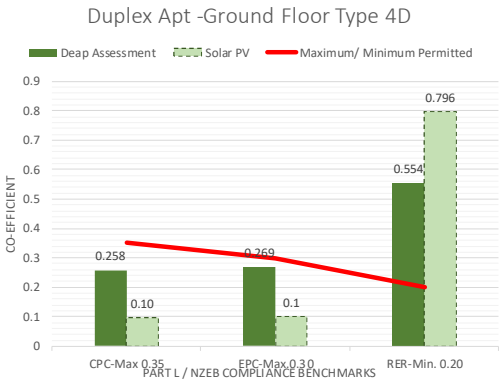
BER Rating A2- Energy Value 35.55 kWh/m2/yr

3.3.1.3 **House Type 4D -** 2-bedroom Ground Floor Duplex Apartment.



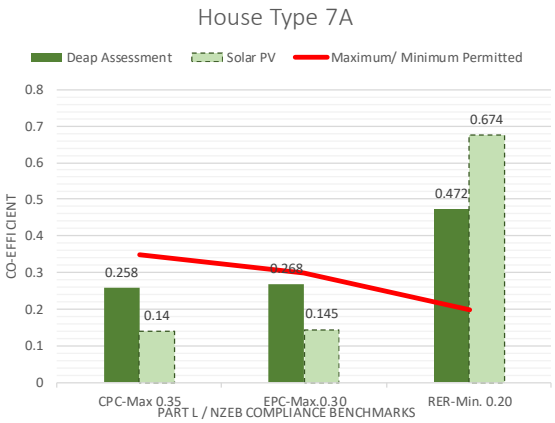
BER Rating A2 - Energy Value 32.37 kWh/m2/yr

3.3.1.4 **House Type 4C -** 3-bedroom First Floor Duplex Apartment/ Town House.



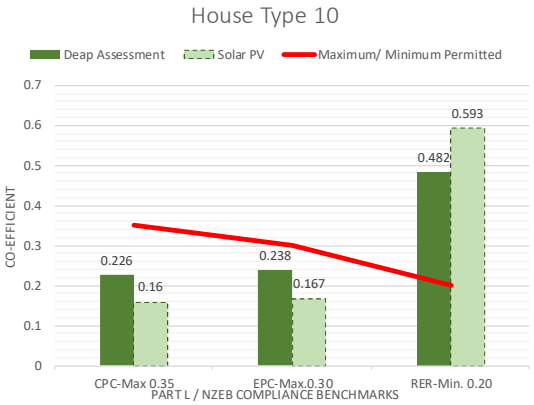
BER Rating A2 - Energy Value 55.28 kWh/m2/yr

3.3.1.5 **House Type 7A -** 2-bedroom Mid-terrace, Town House.



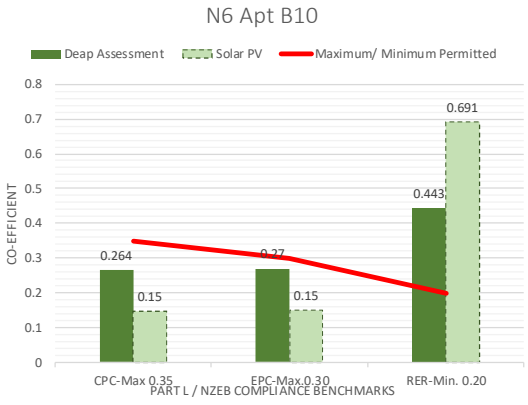
BER Rating A2 - Energy Value 38.56 kWh/m2/yr

3.3.1.5 **House Type 10 -** 2-bedroom Mid-terrace, Town House.



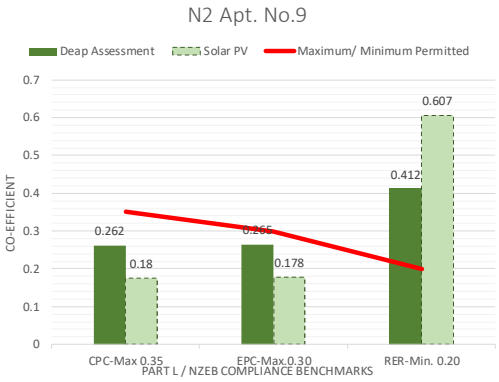
BER Rating A2 - Energy Value 34.60 kWh/m2/yr

3.3.1.6 **Apartment No 10, Block B – N6 –** 2 Bedroom, 1st Floor, Apartment.



BER Rating A2 Energy Value 40.69 kWh/m2/yr

3.3.1.7 **Apartment No. 9 – N2 –** 2 Bedroom, 1st Floor, Apartment.



BER Rating A2 Energy Value 32.27 kWh/m2/yr

4.0 Conclusions

The proposed development has been designed to be compliant with The Building Regulations, Technical Guidance Document Part L, Conservation of Fuel and Energy – Dwellings, 2019.

All residential units are designed to meet NZEB standards. Preliminary DEAP assessments are summarised at 3.3.1.1 – 3.3.1.7 above and detailed within the Part L compliance reports which follow at Section 5.0 below.

To avoid misleading outputs and ensure compliance throughout, the sample unit types and configurations were selected avoiding "ideal" conditions, whether they were conditions of the external environment or interior configuration.

The approach has been to prioritise the basic principles of good, energy efficient design including:

- Orientation and setting on site.
- Passive solar gain/ mitigating against over-heating.
- An emphasis on a highly insulated thermal envelope & airtightness.
- Renewable technologies to maximise efficiency and minimise Carbon Dioxide emissions.
- Offering homeowners, the potential to further improve energy efficiency with minimal disruption. i.e. the introduction of Photo Voltaic technology to supplement primary delivered energy requirements and maximise renewable`s.
- The provision of infrastructure which will allow for the provision of Electric Vehicle charging.

The summary of DEAP assessments set out at section 3.3.1. above, confirm that compliance with NZEB will be comfortably achieved. Assessments set out the potential for further and future improvement in efficiencies of up to 30% with the addition of PV technologies.

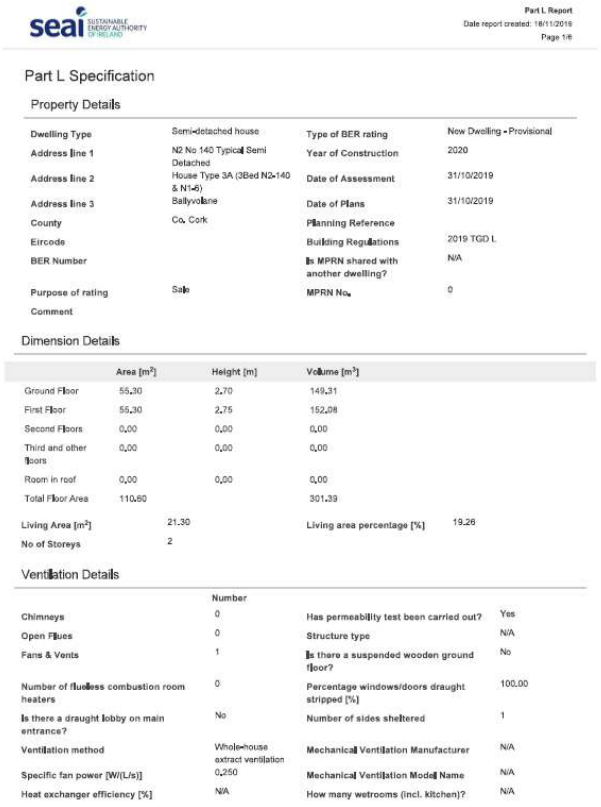
Dwelling houses & Apartments will achieve A2 / A3 Building Energy Ratings with the potential for improvement to A1 with the addition of PV technology.

All houses are designed and proposed to accommodate PV panels / installations if required as part of individual building energy modelling / TGD Part L compliance. Technological changes will occur over the consent life span which may see alternate building methodologies or energy efficiencies allowing for building fabric changes and efficiencies.

5.0 DEAP Part L Reports:

MBA Consulting Engineers	Longview Estates Lahardane Ballyvolane, Cork										Project: Ballyvolane Ref : Prov Part L Job Ref: Prov Const & M&E Date: 08/11/2019 Rev 2
MBA ENGINEERS, TRAMWAY HOUSE, ALBERT ROAD CORK. Ph: 021-4965395, EMAIL mail@mbaengineers.ie											
Dwelling	BER - Full MEV - No PV					BER Full MEV + PV + Shower Flow Restrictors					
	Rating	EPC	CPC	kWh/m2/yr	ReNew (Rev 2)	Rating	EPC	CPC	kWh/m2/yr	ReNew (Rev 2)	Required Improvement
Type 10 - End of Terrace 4 Bed RIR	A2	0,238	0,226	34,6	0,482	A1	0,167	0,159	24,31	0,593	2No PV panels & Shower Flow Restrictors
Type 7A No 67 Mid Terrace Hse 3 Bed	A2	0.268	0.258	38.56	0.472	A1	0.145	0.14	20.98	0.674	3No PV panels & Shower Flow Restrictors
N2 140 Typical Semi Detached House Type 3A (Rev 2 - House No Ammended)	A2	0,269	0.259	37,5	0.471	A1	0,176	0,169	24,65	0,605	2No PV panels & Shower Flow Restrictors
N2 173 Typical Detached House Type 5A (Rev 2 - House No Ammended)	A2	0,236	0,222	35,55	0,429	A1	0,16	0,15	24,16	0,576	3No PV panels & Shower Flow Restrictors
Apt No 10 Block B 1st (Mid) Rev 1	A2	0,27	0,264	40,69	0,443	A1	0,15	0,146	22,59	0,691	3No PV panels & Shower Flow Restrictors
Apt No 9 Block N 2 Bed 1st Floor Rev 1	A2	0,265	0,262	32,27	0,412	A1	0,178	0,176	21,71	0,607	2No PV panels & Shower Flow Restrictors
4C No 82 3 Bed 2 Storey Town House (Rev 2 - House No Ammended)	A2	0.23	0.221	32.37	0.475	A1	0.17	0.164	23.98	0.611	2No PV panels & Shower Flow Restrictors
4D No 81 2 Bed 1 Storey Town House Grd Flr Rev 2 (Rev 2 - House No Ammended)	A3	0.269	0.258	55.28	0.554	A1	0.1	0.096	20.79	0.796	4No PV panels & Shower Flow Restrictors

5.1 House Type 3A



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Part L Specification

Property Details

Dwelling Type	Semi-detached house	Type of BER rating	New Dwelling - Provisional
Address line 1	N2 No 140 Typical Semi Detached	Year of Construction	2020
Address line 2	House Type 3A (3Bed N2-140 & N1-6)	Date of Assessment	31/10/2019
Address line 3	Ballyvolane	Date of Plans	31/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

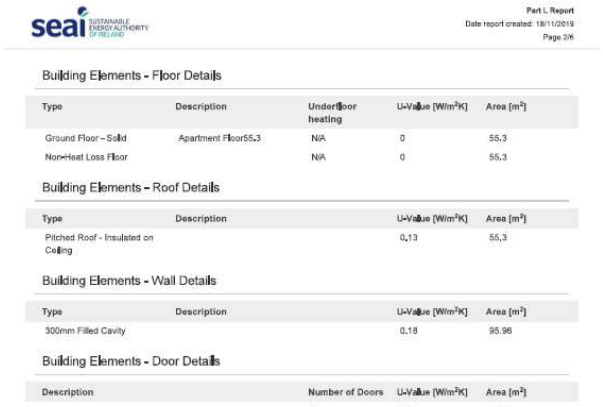
Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	55,30	2,70	149,31
First Floor	55,30	2,75	152,08
Second Floors	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	110,60		301,39

Living Area [m²]	21,30	Living area percentage [%]	19,26
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100,00
Is there a draught lobby on main entrance?	No	Number of sides sheltered	1
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0,250	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A



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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Ground Floor - Solid	Apartment Floor55.3	N/A	0	55,3
Non-Heat Loss Floor		N/A	0	55,3

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]
Pitched Roof - Insulated on Ceiling		0,13	55,3

Building Elements - Wall Details

Type	Description	U-Value [W/m²K]	Area [m²]
300mm Filled Cavity		0,18	95,96

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1,2	2,040

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0,2, hard coat)	Yes	1,000	3,320
Double-glazed, air filled (low-E, en = 0,2, hard coat)	Yes	1,000	1,200
Double-glazed, air filled (low-E, en = 0,2, hard coat)	Yes	1,000	2,400
Double-glazed, air filled (low-E, en = 0,2, hard coat)	Yes	1,000	1,320
Double-glazed, air filled (low-E, en = 0,2, hard coat)	Yes	1,000	2,340
Double-glazed, air filled (low-E, en = 0,2, hard coat)	Yes	1,000	1,080
Double-glazed, air filled (low-E, en = 0,2, hard coat)	Yes	1,000	0,800

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Other Details

Thermal bridging factor [W/m²k]	0,0800	Thermal mass category of dwelling	Medium-High

Heating System - Solar Water Heating

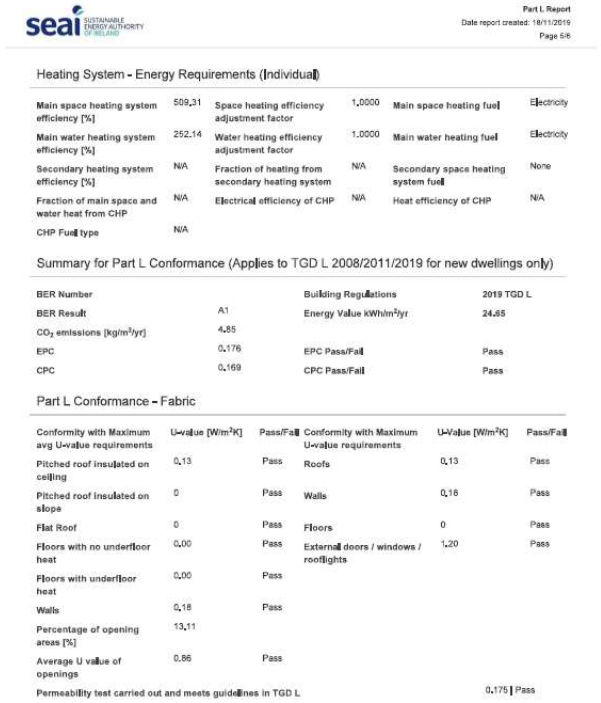
Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	285.93	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	Daikin ERGA04DV3	Declared loss factor [kWh/d]	1,20
Temperature factor unadjusted	0,89	Temperature Factor Multiplier	0,81
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

Temperature adjustment [°C]	0	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		



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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	509.31	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A1	Energy Value kWh/m²/yr	24.65
CO_2 emissions [kg/m²/yr]	4.85		
EPC	0.176	EPC Pass/Fail	Pass
CPC	0.169	CPC Pass/Fail	Pass

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.13	Pass	Roofs	0.13	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.20	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	13.11				
Average U value of openings	0.86	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175	Pass

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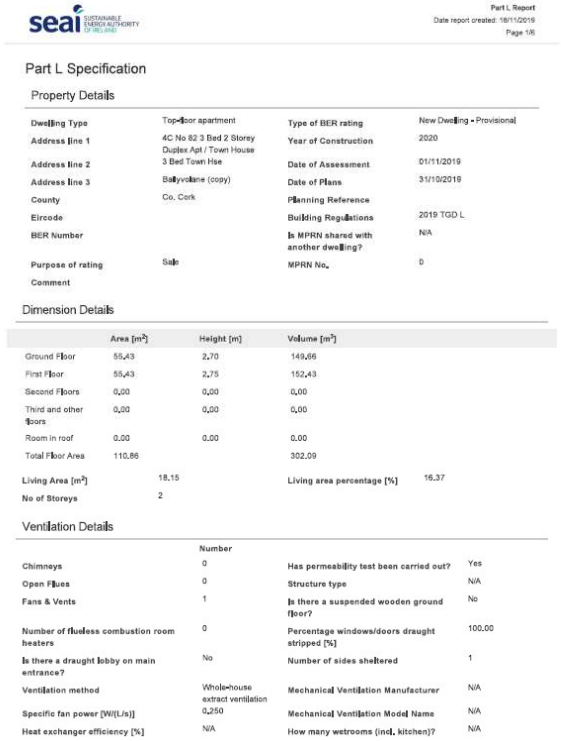
Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	1222.361	11.052
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	18.659	0.171
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	446.784	4.040
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	1241.220	11.223
Total electrical	446.784	4.040
Total thermal equivalent	2358.180	21.322
Does total thermal equivalent meet part L requirement?	Pass	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	929.311	929.311	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	3252.652	3252.652	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	2726.324	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		4181.962	6908.287	0.605 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		4181.962	6908.287	0.605

5.2 House Type 4C



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Part L Specification

Property Details

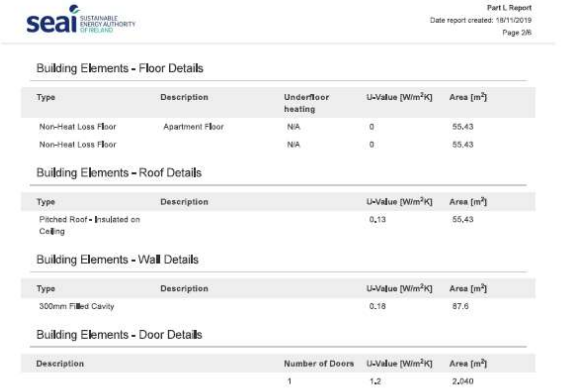
Dwelling Type	Top-floor apartment	Type of BER rating	New Dwelling - Provisional
Address line 1	4C No 82 3 Bed 2 Storey Duplex Apt / Town House	Year of Construction	2020
Address line 2	3 Bed Town Hse	Date of Assessment	01/11/2019
Address line 3	Ballyvolane (copy)	Date of Plans	31/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	55.43	2.70	149.66
First Floor	55.43	2.75	152.43
Second Floors	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	110.86		302.09
Living Area [m²]	18.15	Living area percentage [%]	16.37
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100.00
Is there a draught lobby on main entrance?	No	Number of sides sheltered	1
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0.250	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A



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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Non-Heat Loss Floor	Apartment Floor	N/A	0	55.43
Non-Heat Loss Floor		N/A	0	55.43

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]
Pitched Roof - Insulated on Ceiling		0.13	55.43

Building Elements - Wall Details

Type	Description	U-Value [W/m²K]	Area [m²]
300mm Filled Cavity		0.18	87.6

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1.2	2.040

5.2 House Type 4C Cont`d

Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.600
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.430
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.350
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.900
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.940
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.700
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.000
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.360
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.880
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.670
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.450
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.930
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.750

Other Details

Thermal bridging factor [W/m²k]	0.0800	Thermal mass category of dwelling	Medium-high

Heating System - Solar Water Heating

Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	286.04	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	Daikin ERGA04DV3	Declared loss factor [kWh/d]	1.20
Temperature factor unadjusted	0.89	Temperature Factor Multiplier	0.81
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

Temperature adjustment [°C]	0	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 [%]	509.31	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A1	Energy Value kWh/m²/yr	23.98
CO_2 emissions [kg/m²/yr]	4.72		
EPC	0.170	EPC Pass/Fail	Pass
CPC	0.164	CPC Pass/Fail	Pass

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.13	Pass	Roofs	0.13	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.20	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	26.16				
Average U value of openings	0.83	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175 | Pass	

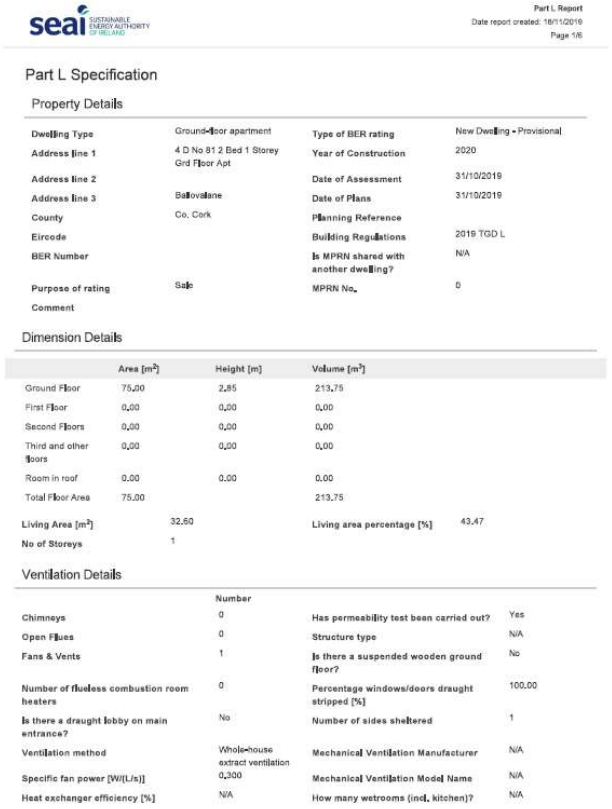
Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	1211.003	10.924
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	18.864	0.170
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	446.784	4.030
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	1229.868	11.094
Total electrical	446.784	4.030
Total thermal equivalent	2346.828	21.169
Does total thermal equivalent meet part L requirement?	Pass	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	929.311	929.311	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	3252.652	3252.652	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	2658.772	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		4181.962	6840.734	0.611 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		4181.962	6840.734	0.611

5.2 House Type 4D



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Part L Specification

Property Details

Dwelling Type	Ground-floor apartment	Type of BER rating	New Dwelling - Provisional
Address line 1	4 D No 81 2 Bed 1 Storey Grd Floor Apt	Year of Construction	2020
Address line 2		Date of Assessment	31/10/2019
Address line 3	Ballovalane	Date of Plans	31/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

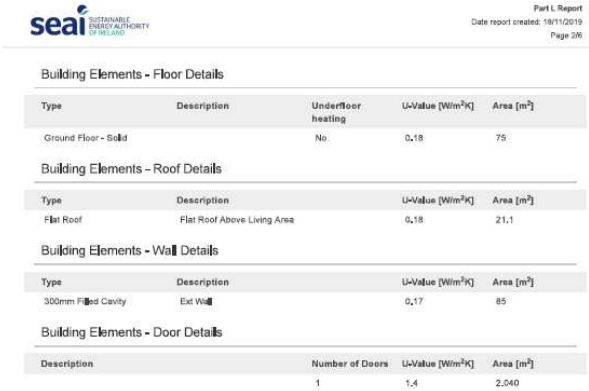
Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	75.00	2.85	213.75
First Floor	0.00	0.00	0.00
Second Floors	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	75.00		213.75

Living Area [m²]	32.50	Living area percentage [%]	43.47
No of Storeys	1		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100.00
Is there a draught lobby on main entrance?	No	Number of sides sheltered	1
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0.300	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A



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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Ground Floor - Solid		No	0.18	75

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]
Flat Roof	Flat Roof Above Living Area	0.18	21.1

Building Elements - Wall Details

Type	Description	U-Value [W/m²K]	Area [m²]
300mm Filled Cavity	Ext Wall	0.17	85

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1.4	2.040

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.000
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.500
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.520
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.100
Double-glazed, argon filled	Yes	1.200	6.240
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.300

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Other Details

Thermal bridging factor [W/m²k]	0.0800	Thermal mass category of dwelling	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

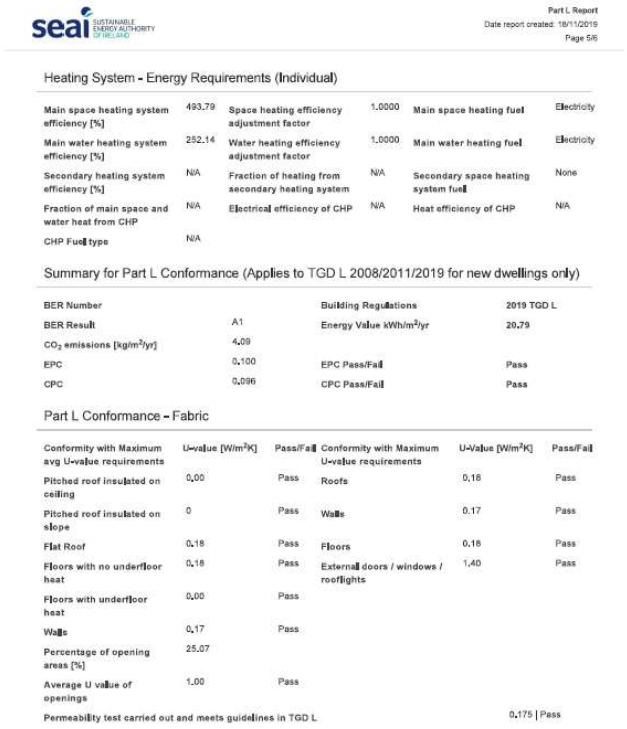
Heating System - Hot Water System

Distribution Losses	221.36	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	ERGA04DV3	Declared loss factor [kWh/d]	1.20
Temperature factor unadjusted	0.89	Temperature Factor Multiplier	0.81
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

Temperature adjustment [°C]	0	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		

5.2 House Type 4D Cont`d



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Heating System - Energy Requirements (Individual)

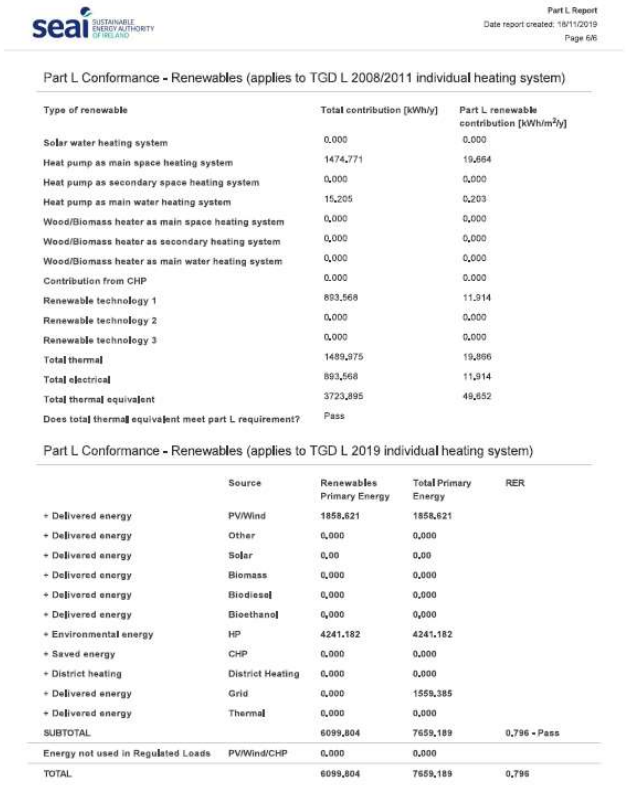
Main space heating system efficiency [%]	493.79	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A1	Energy Value kWh/m²/yr	20.79
CO_2 emissions [kg/m²/yr]	4.09		
EPC	0.100	EPC Pass/Fail	Pass
CPC	0.096	CPC Pass/Fail	Pass

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0.18	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.17	Pass
Flat Roof	0.18	Pass	Floors	0.18	Pass
Floors with no underfloor heat	0.18	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.17	Pass			
Percentage of opening areas [%]	25.07				
Average U value of openings	1.00	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175	Pass



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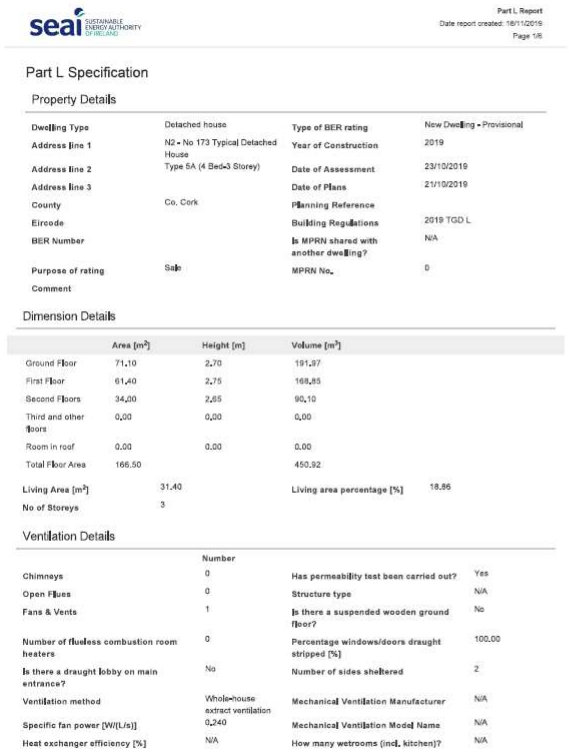
Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	1474.771	19.664
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	15.205	0.203
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	893.568	11.914
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	1489.975	19.866
Total electrical	893.568	11.914
Total thermal equivalent	3723.895	49.652
Does total thermal equivalent meet part L requirement?	Pass	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	1858.621	1858.621	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	4241.182	4241.182	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	1559.385	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		6099.804	7659.189	0.796 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		6099.804	7659.189	0.796

5.2 House Type 5A



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Property Details

Dwelling Type	Detached house	Type of BER rating	New Dwelling - Provisional
Address line 1	N2 - No 173 Typical Detached House	Year of Construction	2019
Address line 2	Type 5A (4 Bed-3 Storey)	Date of Assessment	23/10/2019
Address line 3		Date of Plans	21/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	71.10	2.70	191.97
First Floor	61.40	2.75	168.85
Second Floors	34.00	2.65	90.10
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	166.50		450.92
Living Area [m²]	31.40	Living area percentage [%]	18.86
No of Storeys	3		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100.00
Is there a draught lobby on main entrance?	No	Number of sides sheltered	2
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0.240	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A

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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Ground Floor - Solid	Grd Floor	No	0.18	71.1
Non-Heat Loss Floor	1st Floor	N/A	0	61.4
Non-Heat Loss Floor	2nd Flr	N/A	0	34

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]
Pitched Roof - Insulated on Ceiling	Ceiling House + Kitchen	0.13	27.13
Pitched Roof - Insulated on Rafter	R|R 2nd Flr	0.15	15.8
Pitched Roof - Insulated on Ceiling	Crawl Space	0.13	27.4

Building Elements - Wall Details

Type	Description	U-Value [W/m²K]	Area [m²]
300mm Filled Cavity		0.17	194.21
Timber Frame	KNee Wall	0.15	29.46
Timber Frame	Dormer Window Wall	0.16	2.8

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1.2	2.400

5.2 House Type 5A Cont`d

Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.400	3.700
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.400	2.100
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.260
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.560
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.600
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.630
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.150
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.960
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.850
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.120
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.300
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.800
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.120
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.700
Double-glazed, argon filled	Yes	1.300	0.700
Double-glazed, argon filled	Yes	1.300	0.700

Other Details

Thermal bridging factor [W/m²k]	0.0800	Thermal mass category of dwelling	Medium-high

Heating System - Solar Water Heating

Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	295.29	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	Daikin	Declared loss factor [kWh/d]	1.20
Temperature factor unadjusted	0.89	Temperature Factor Multiplier	0.81
Primary Circuit loss type	None		
Is hot water storage indoors or in group heating system?	Yes		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	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 [%]	496.45	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A1	Energy Value kWh/m²/yr	24.16
CO_2 emissions [kg/m²/yr]	4.75		
EPC	0.160	EPC Pass/Fail	Pass
CPC	0.150	CPC Pass/Fail	Pass

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.13	Pass	Roofs	0.15	Pass
Pitched roof insulated on slope	0.15	Pass	Walls	0.17	Pass
Flat Roof	0	Pass	Floors	0.18	Pass
Floors with no underfloor heat	0.18	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.17	Pass			
Percentage of opening areas [%]	17.21				
Average U value of openings	0.95	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175 | Pass	

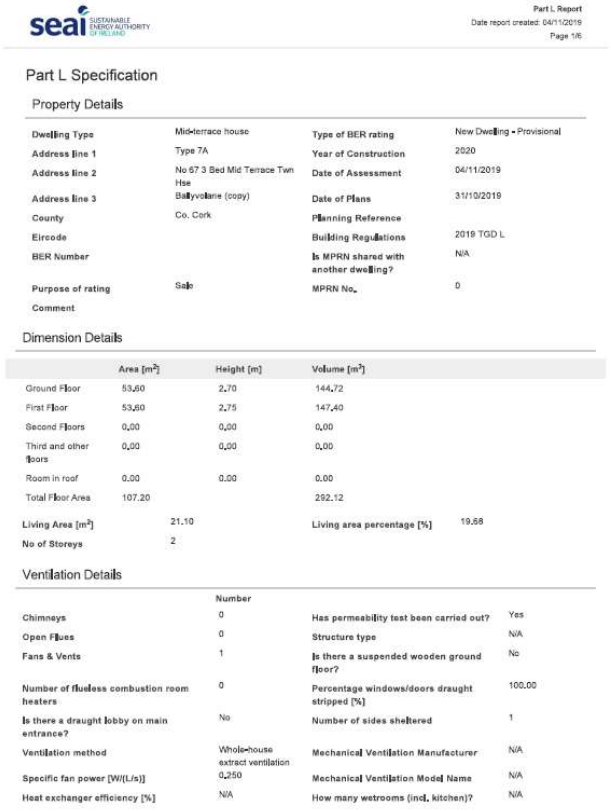
Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	2950.588	17.721
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	19.388	0.116
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	670.176	4.025
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	2969.976	17.838
Total electrical	670.176	4.025
Total thermal equivalent	4645.416	27.900
Does total thermal equivalent meet part L requirement?	Pass	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	1393.966	1393.966	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	4062.413	4062.413	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	4021.938	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		5456.379	9478.317	0.576 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		5456.379	9478.317	0.576

5.2 House Type 7A



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Part L Specification

Property Details

Dwelling Type	Mid-terrace house	Type of BER rating	New Dwelling - Provisional
Address line 1	Type 7A	Year of Construction	2020
Address line 2	No 67 3 Bed Mid Terrace Twn Hse	Date of Assessment	04/11/2019
Address line 3	Ballyvolane (copy)	Date of Plans	31/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

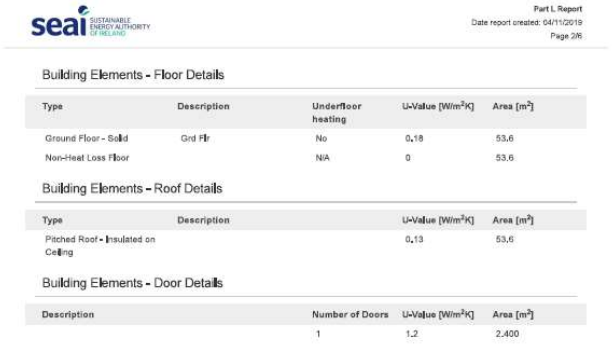
Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	53.60	2.70	144.72
First Floor	53.60	2.75	147.40
Second Floors	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	107.20		292.12

Living Area [m²]	21.10	Living area percentage [%]	19.68
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100.00
Is there a draught lobby on main entrance?	No	Number of sides sheltered	1
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0.250	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A



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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Ground Floor - Solid	Grd Flr	No	0.18	53.6
Non-Heat Loss Floor		N/A	0	53.6

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]
Pitched Roof - Insulated on Ceiling		0.13	53.6

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1.2	2.400

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.500
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.320
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.080
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.800
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.300
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.830
Double-glazed, argon filled	Yes	1.200	3.780

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Other Details

Thermal bridging factor [W/m²k]	0.0800	Thermal mass category of dwelling	Medium-high

Heating System - Solar Water Heating

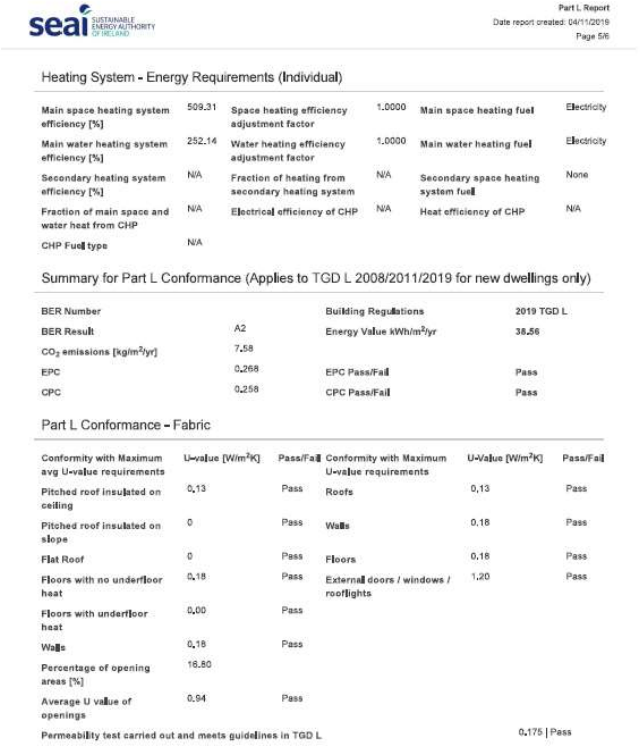
Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	381.39	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	Daikin ERGA04DV3	Declared loss factor [kWh/d]	1.20
Temperature factor unadjusted	0.89	Temperature Factor Multiplier	0.81
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

Temperature adjustment [°C]	0	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		



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Heating System - Energy Requirements (Individual)

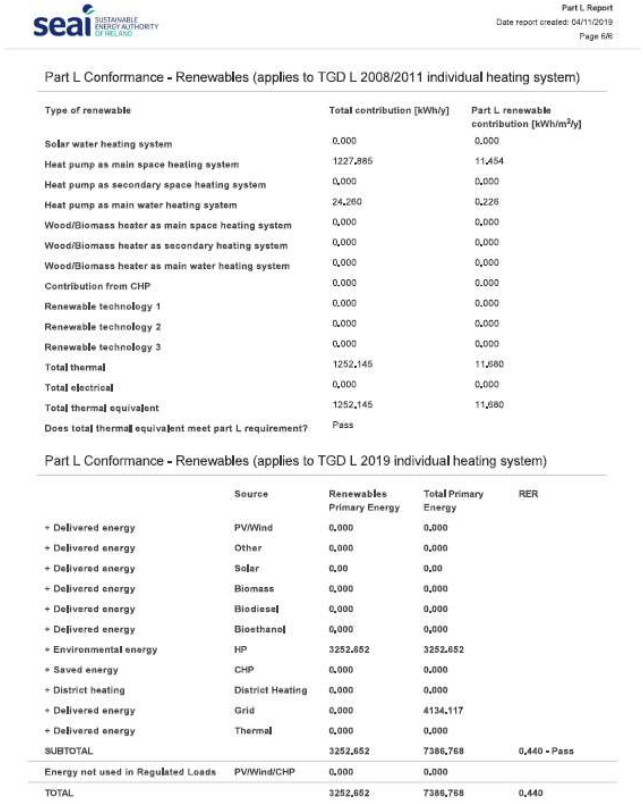
Main space heating system efficiency [%]	509.31	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m²/yr	38.56
CO_2 emissions [kg/m²/yr]	7.58		
EPC	0.268	EPC Pass/Fail	Pass
CPC	0.258	CPC Pass/Fail	Pass

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.13	Pass	Roofs	0.13	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0.18	Pass
Floors with no underfloor heat	0.18	Pass	External doors / windows / rooflights	1.20	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	16.80				
Average U value of openings	0.94	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175 | Pass	



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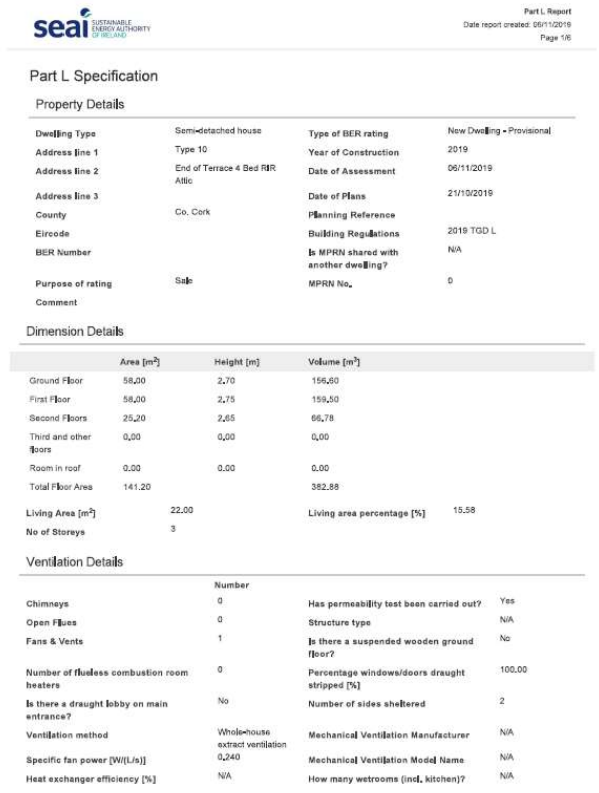
Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	1227.885	11.454
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	24.260	0.226
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	0.000	0.000
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	1252.145	11.680
Total electrical	0.000	0.000
Total thermal equivalent	1252.145	11.680
Does total thermal equivalent meet part L requirement?	Pass	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.000	0.000	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	3252.652	3252.652	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	4134.117	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		3252.652	7386.768	0.440 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		3252.652	7386.768	0.440

5.2 House Type 10



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Part L Specification

Property Details

Dwelling Type	Semi-detached house	Type of BER rating	New Dwelling - Provisional
Address line 1	Type 10	Year of Construction	2019
Address line 2	End of Terrace 4 Bed RIR Attic	Date of Assessment	06/11/2019
Address line 3		Date of Plans	21/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

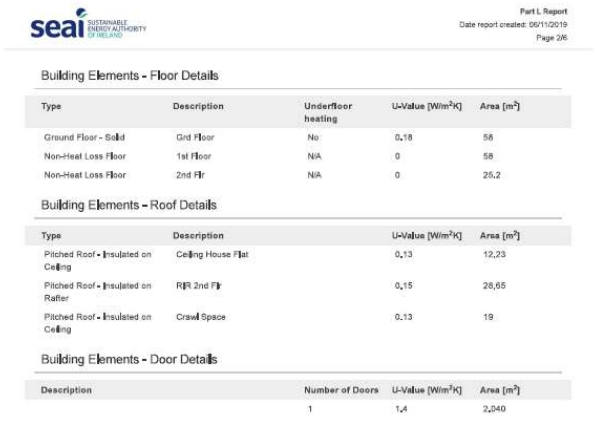
Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	58.00	2.70	156.60
First Floor	58.00	2.75	159.50
Second Floors	25.20	2.65	66.78
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	141.20		382.88

Living Area [m²]	22.00	Living area percentage [%]	15.58
No of Storeys	3		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100.00
Is there a draught lobby on main entrance?	No	Number of sides sheltered	2
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0.240	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A



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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Ground Floor - Solid	Grd Floor	No	0.18	58
Non-Heat Loss Floor	1st Floor	N/A	0	58
Non-Heat Loss Floor	2nd Flr	N/A	0	25.2

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]
Pitched Roof - Insulated on Ceiling	Ceiling House Flat	0.13	12.23
Pitched Roof - Insulated on Rafter	RIR 2nd Flr	0.15	28.65
Pitched Roof - Insulated on Ceiling	Crawl Space	0.13	19

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1.4	2.040

5.2 House Type 10 Cont`d

Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.540
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.400
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	0.820
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.000
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.160
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.800
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.200
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.300
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.080
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.430
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.300
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	1.100
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	2.160
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.400	3.780

Other Details

Thermal bridging factor [W/m²k]	0.0800	Thermal mass category of dwelling	Medium-high

Heating System - Solar Water Heating

Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	392.4	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	Daikin	Declared loss factor [kWh/d]	1.20
Temperature factor unadjusted	0.89	Temperature Factor Multiplier	0.81
Primary Circuit loss type	None		
Is hot water storage indoors or in group heating system?	Yes		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	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 [%]	496.45	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m²/yr	34.46
CO_2 emissions [kg/m²/yr]	6.78		
EPC	0.238	EPC Pass/Fail	Pass
CPC	0.226	CPC Pass/Fail	Pass

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.13	Pass	Roofs	0.15	Pass
Pitched roof insulated on slope	0.15	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0.18	Pass
Floors with no underfloor heat	0.18	Pass	External doors / windows / rooflights	1.40	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.17	Pass			
Percentage of opening areas [%]	19.20				
Average U value of openings	0.90	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175 | Pass	

Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	1795.641	12.717
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	24.883	0.176
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	0.000	0.000
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	1820.524	12.893
Total electrical	0.000	0.000
Total thermal equivalent	1820.524	12.893
Does total thermal equivalent meet part L requirement?	Pass	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.000	0.000	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	4062.413	4062.413	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	4866.304	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		4062.413	8928.716	0.455 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		4062.413	8928.716	0.455

5.2 Apartment 9 – N2

Part L Specification

Property Details

Dwelling Type	Mid-floor apartment	Type of BER rating	New Dwelling - Provisional
Address line 1	Apt No 9	Year of Construction	2020
Address line 2	Block N Mid Flr Apt 2 Bed	Date of Assessment	04/11/2019
Address line 3	Ballyvolane (copy) (copy)	Date of Plans	31/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	88.00	2.70	237.60
First Floor	0.00	0.00	0.00
Second Floors	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	88.00		237.60

Living Area [m²]	21.10	Living area percentage [%]	23.98
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100.00
Is there a draught lobby on main entrance?	Yes	Number of sides sheltered	1
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0.280	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Non-Heat Loss Floor	Grd Flr	N/A	0	88

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1.2	2.200

Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	6.800
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.400
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.000	3.400

Other Details

Thermal bridging factor [W/m²k]	0.0800	Thermal mass category of dwelling	Medium-High

Heating System - Solar Water Heating

Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

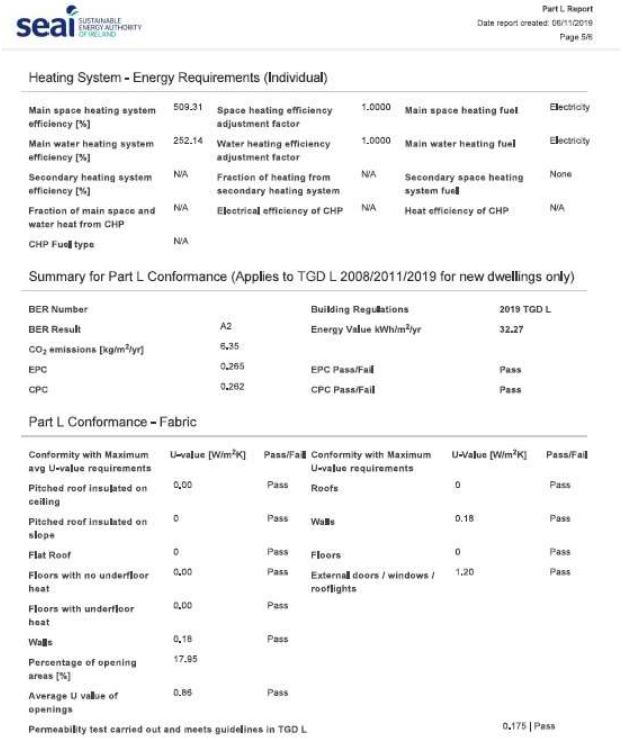
Heating System - Hot Water System

Distribution Losses	271.1	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	Daikin ERGA04DV3	Declared loss factor [kWh/d]	1.20
Temperature factor unadjusted	0.89	Temperature Factor Multiplier	0.81
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

Temperature adjustment [°C]	0	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		

5.2 Apartment 9 – N2 Cont`d



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Heating System - Energy Requirements (Individual)

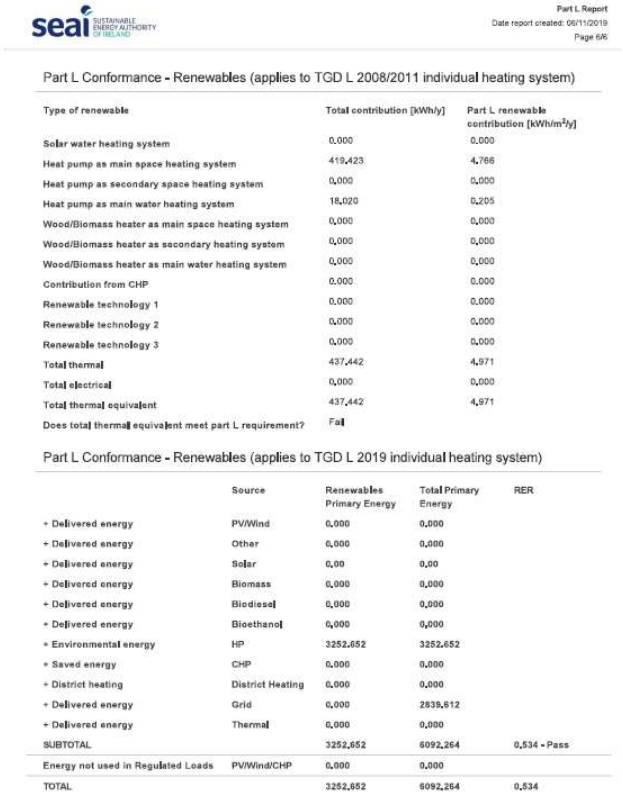
Main space heating system efficiency [%]	509.31	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m²/yr	32.27
CO_2 emissions [kg/m²/yr]	6.35		
EPC	0.265	EPC Pass/Fail	Pass
CPC	0.262	CPC Pass/Fail	Pass

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	U-value [W/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0	Pass
Floors with no underfloor heat	0.00	Pass	External doors / windows / rooflights	1.20	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	17.85				
Average U value of openings	0.86	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175 | Pass	



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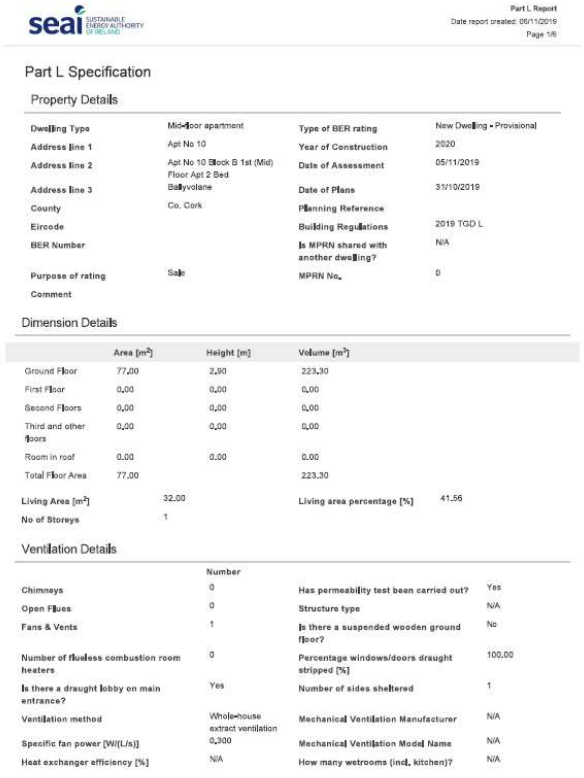
Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	419.423	4.766
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	18.020	0.205
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	0.000	0.000
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	437.442	4.971
Total electrical	0.000	0.000
Total thermal equivalent	437.442	4.971
Does total thermal equivalent meet part L requirement?	Fail	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.000	0.000	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	3252.652	3252.652	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	2839.612	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		3252.652	6092.264	0.534 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		3252.652	6092.264	0.534

5.2 Apartment 10 – N6 – Block B



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Part L Specification

Property Details

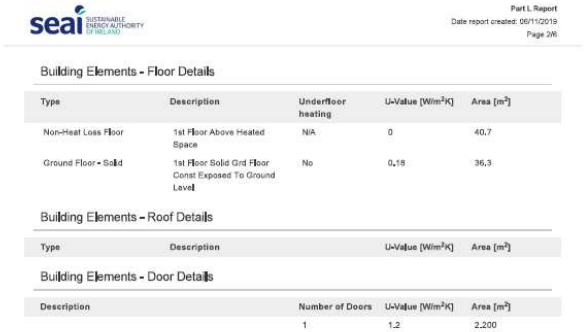
Dwelling Type	Mid-floor apartment	Type of BER rating	New Dwelling - Provisional
Address line 1	Apt No 10	Year of Construction	2020
Address line 2	Apt No 10 Block B 1st (Mid) Floor Apt 2 Bed	Date of Assessment	05/11/2019
Address line 3	Ballyvolane	Date of Plans	31/10/2019
County	Co. Cork	Planning Reference	
Eircode		Building Regulations	2019 TGD L
BER Number		Is MPRN shared with another dwelling?	N/A
Purpose of rating	Sale	MPRN No.	0
Comment			

Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	77.00	2.90	223.30
First Floor	0.00	0.00	0.00
Second Floors	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	77.00		223.30
Living Area [m²]	32.00	Living area percentage [%]	41.56
No of Storeys	1		

Ventilation Details

	Number		
Chimneys	0	Has permeability test been carried out?	Yes
Open Flues	0	Structure type	N/A
Fans & Vents	1	Is there a suspended wooden ground floor?	No
Number of flueless combustion room heaters	0	Percentage windows/doors draught stripped [%]	100.00
Is there a draught lobby on main entrance?	Yes	Number of sides sheltered	1
Ventilation method	Whole-house extract ventilation	Mechanical Ventilation Manufacturer	N/A
Specific fan power [W/(L/s)]	0.300	Mechanical Ventilation Model Name	N/A
Heat exchanger efficiency [%]	N/A	How many wetrooms (incl. kitchen)?	N/A



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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Non-Heat Loss Floor	1st Floor Above Heated Space	N/A	0	40.7
Ground Floor - Solid	1st Floor Solid Grd Floor Const Exposed To Ground Level	No	0.18	36.3

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	1.2	2.200

5.2 Apartment 10 – N6 – Block B Cont`d

Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.200	3.780
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.200	3.780
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.200	7.200

Other Details

Thermal bridging factor [W/m²k]	0.0800	Thermal mass category of dwelling	Medium-high

Heating System - Solar Water Heating

Solar Water Heating Present?	No	Aperture area of solar collector [m²]	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	Collector heat loss coefficient, a1 [W/m²>K]	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	Overshading factor	N/A
Dedicated storage volume [Litres]	N/A	Combined Cylinder	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	259.9	Combi boiler present?	No
Supplementary electric water heating	N/A	Water Storage Volume [L]	180
Hot water storage manufacturer and model name	Daikin ERGA04DV3	Declared loss factor [kWh/d]	1.20
Temperature factor unadjusted	0.89	Temperature Factor Multiplier	0.81
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

Temperature adjustment [°C]	0	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 [%]	386.02	Space heating efficiency adjustment factor	1.0000	Main space heating fuel	Electricity
Main water heating system efficiency [%]	252.14	Water heating efficiency adjustment factor	1.0000	Main water heating fuel	Electricity
Secondary heating system efficiency [%]	N/A	Fraction of heating from secondary heating system	N/A	Secondary space heating system fuel	None
Fraction of main space and water heat from CHP	N/A	Electrical efficiency of CHP	N/A	Heat efficiency of CHP	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		Building Regulations	2019 TGD L
BER Result	A2	Energy Value kWh/m²/yr	40.69
CO_2 emissions [kg/m²/yr]	8		
EPC	0.270	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/m²K]	Pass/Fail	Conformity with Maximum U-value requirements	U-Value [W/m²K]	Pass/Fail
Pitched roof insulated on ceiling	0.00	Pass	Roofs	0	Pass
Pitched roof insulated on slope	0	Pass	Walls	0.18	Pass
Flat Roof	0	Pass	Floors	0.18	Pass
Floors with no underfloor heat	0.18	Pass	External doors / windows / rooflights	1.20	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	22.03				
Average U value of openings	0.85	Pass			
Permeability test carried out and meets guidelines in TGD L				0.175 | Pass	

Part L Conformance - Renewables (applies to TGD L 2008/2011 individual heating system)

Type of renewable	Total contribution [kWh/y]	Part L renewable contribution [kWh/m²/y]
Solar water heating system	0.000	0.000
Heat pump as main space heating system	502.244	6.523
Heat pump as secondary space heating system	0.000	0.000
Heat pump as main water heating system	17.385	0.226
Wood/Biomass heater as main space heating system	0.000	0.000
Wood/Biomass heater as secondary heating system	0.000	0.000
Wood/Biomass heater as main water heating system	0.000	0.000
Contribution from CHP	0.000	0.000
Renewable technology 1	0.000	0.000
Renewable technology 2	0.000	0.000
Renewable technology 3	0.000	0.000
Total thermal	519.630	6.748
Total electrical	0.000	0.000
Total thermal equivalent	519.630	6.748
Does total thermal equivalent meet part L requirement?	Fail	

Part L Conformance - Renewables (applies to TGD L 2019 individual heating system)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.000	0.000	
+ Delivered energy	Other	0.000	0.000	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.000	0.000	
+ Delivered energy	Biodiesel	0.000	0.000	
+ Delivered energy	Bioethanol	0.000	0.000	
+ Environmental energy	HP	2491.363	2491.363	
+ Saved energy	CHP	0.000	0.000	
+ District heating	District Heating	0.000	0.000	
+ Delivered energy	Grid	0.000	3133.078	
+ Delivered energy	Thermal	0.000	0.000	
SUBTOTAL		2491.363	5624.441	0.443 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.000	0.000	
TOTAL		2491.363	5624.441	0.443