Limerick City & County Council in partnership with Limerick Twenty Thirty DAC

Cleeves Riverside Quarter (CRQ)

Energy Statement Report

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1. Introduction

This Energy Statement Report has been prepared by Arup on behalf of Limerick City & County Council in partnership with Limerick Twenty Thirty DAC (LTT) as part of a planning application for the proposed Cleeves Riverside Quarter Development.

Limerick City and County Council, in partnership with Limerick Twenty Thirty DAC, intends to seek the approval of An Coimisiún Pleanála in accordance with Section 175 and 177AE of the Planning and Development Act 2000, as amended, for a mixed-use development that seeks the regeneration and adaptive reuse of a strategic brownfield site, as part of the Limerick City and County Council 'World Class Waterfront revitalisation and transformation project'.

In alignment with the requirements of the Limerick City & County Council Development Plan 2022–2028 and its emphasis on energy efficiency, this document serves as the Energy Statement for the new residential development at the Cleeves Riverside Quarter (CRQ).

The Energy Statement ensures that the proposed development incorporates energy efficiency principles and prioritises the use of efficient and renewable energy sources. This statement looks at how the design team have reviewed the proposed development and identified opportunities to implement nearly Zero Energy Buildings (nZEB) solutions to reduce the energy demand from building services and meet the targets set by the Irish Building Regulations, Technical Guidance Document Part L 2022 - Conservation of Fuel and Energy - Dwellings.

To meet these objectives, this document explores a range of passive and active design strategies. These include an analysis of the technical, environmental, and economic feasibility of high-efficiency alternative energy systems, such as heat pumps and other low-carbon heating options. As stipulated in the Part L 2022 for Dwellings, a DEAP (Dwelling Energy Assessment Procedure) assessment was conducted to evaluate the primary energy consumption and carbon emissions associated with the operation of the dwellings and verify they are in line with the current regulation.

All the building services options presented in this report under Section 4 for each building type of the development have demonstrated compliance with Part L 2022 for Dwellings.

2. The Proposed Development

The proposed development comprises Phase II, of an overall Masterplan with four phases of development proposed. Phase II is subsequent to ongoing stabilisation and repair of the Flaxmill protected structure (Phase I). Phase III is intended to comprise an educational campus, inclusive of the adaptive reuse of the Flaxmill Building as part of that development and will be subject to a future separate application. Phase IV comprising the Shipyard site will be the final phase of development.

The proposed development provides for the (A) Demolition of a number of structures to facilitate development and (B) Construction and phased delivery of (i) buildings within the site ranging in height from 3 – 7 stories (with screened plant at roof level) including (a) 234 no. residential units; (b) 270 no. student bedspaces (PBSA) with ancillary resident services at ground floor level; (c) 256sqm of commercial floorspace; and (d) a creche; (ii) extensive public realm works, (iii) riverside canopy and heritage interpretative panels, (iv) 3 no. dedicated bat houses; (v) Mobility Hub with canopy; and (vi) all ancillary site development works including (a) water services, foul and surface water drainage and associated connections across the site and serving each development zone; (b) attenuation measures; (c) raising the level of North Circular Road; (d) car and bicycle parking; (e) public lighting; (f) telecommunication antennae and (g) all landscaping works. Consent is also sought for use of the PBSA accommodation, outside of student term time, for short-term letting purposes. Figure 2 below illustrates the proposed Phase II site development.

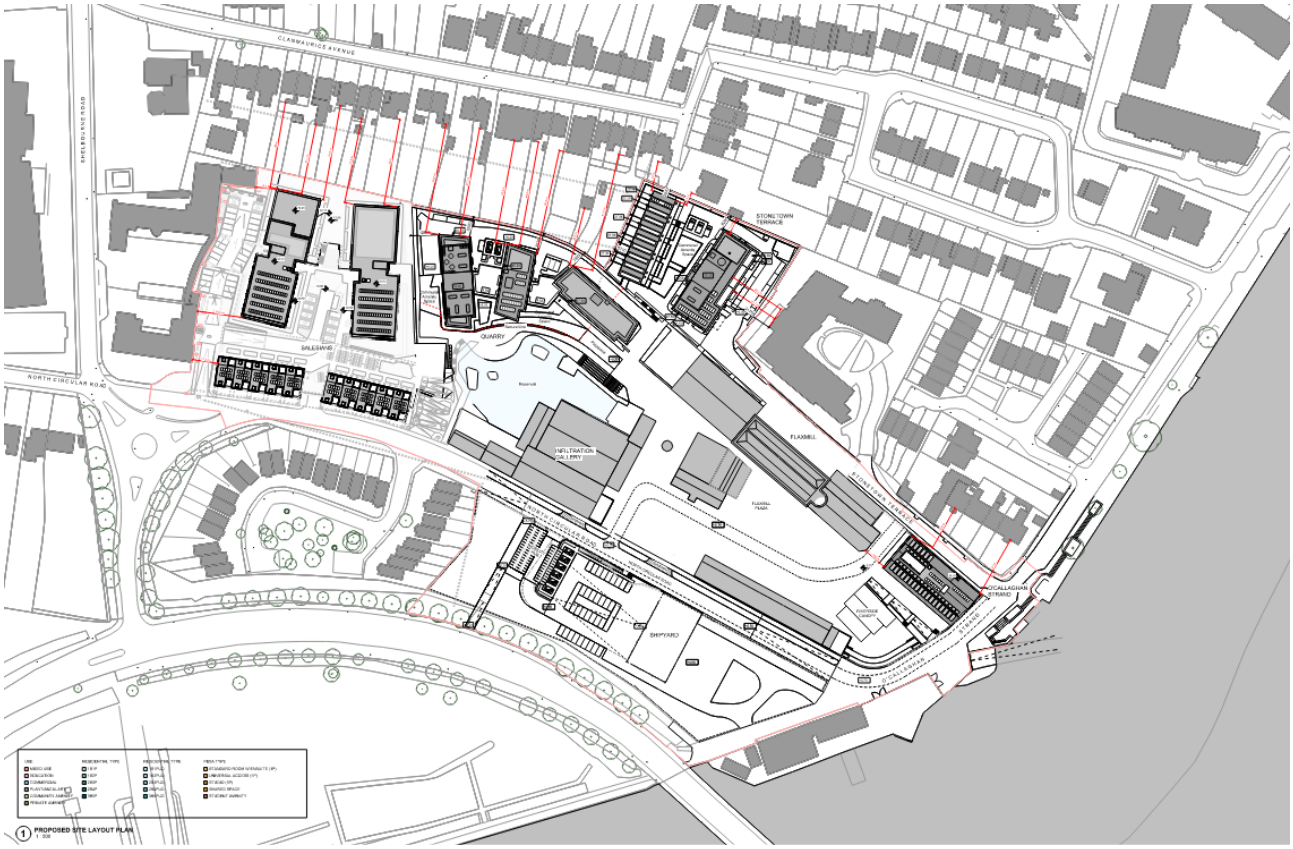

Figure 1: CRQ Proposed Phase II Site Development

2.1 Residential Zones

The four residential zones; Salesians, Quarry, Stonetown Terrace, and O'Callaghan Strand comprises the construction of new apartment and townhouse buildings that will be designed to meet the current Part L 2022 regulations and achieve a BER A2 for dwellings.

The four 'zones' within the site range in height from 3 – 7 storeys (with screened service plant at roof level) comprising; (a) 234 no. residential units; (b) 270 no. student bedspaces with ancillary resident services at ground floor level; (c) 256sqm of commercial floorspace; and (d) a creche. The specific development details of each proposed development zone comprise the following:

- Salesians Zone – 1 no. building with 2 no. blocks extending to 6 and 7 storeys comprising 146 no. apartments (76 no. 1 bed; and 70 no. 2 bed); a creche; semi basement car and bicycle parking; reception area, plant rooms, and refuse storage, with screened external plant and photovoltaic panels at roof level; 20 no. 3 storey 3 bed triplexe units with photovoltaic panels at roof level; and 30 no. car parking spaces for the dedicated use of the adjoining Salesians Primary School.
- Quarry Zone – 1 no. Purpose Built Student Accommodation (PBSA) building with 3 no. blocks extending to 6 and 7 storeys comprising 270 no. bedspaces with study rooms, shared areas, exercise room, reception area, plant rooms, refuse storage and bicycle parking all at ground floor level and screened external plant and photovoltaic panels at roof level. Provision is made for telecommunication antennae on the roof top of one block. Consent is also sought for use of the PBSA accommodation, outside of student term time, for short-term letting purposes.
- Stonetown Terrace Zone – 1 no. building extending to 4 - 5 storeys comprising 38 no. apartments (6 no. studios; 12 no. 1 beds; and 20 no. 2 beds) with plant rooms and refuse storage at ground level, ancillary infrastructure at basement level at northern end of the block, with screened external plant and photovoltaic panels at roof level; 9 no. 3 storey 3 bed townhouses with photovoltaic panels at roof level; and a dedicated secure bicycle storage facility.

- O'Callaghan Strand Zone – 1 no. building extending to 4 / 5 storeys comprising 21 no. apartments (9 no. 1 bed and 12 no. 2 bed) with an open roof structure accommodating communal open space, plant and photovoltaic panels; and 299qm of commercial ground floorspace intended to accommodate Class 1, Class 2 and / or Class 3 uses, with provision for car parking in the undercroft.

2.2 Site Location

The site, known locally as 'Cleeves Riverside Quarter' comprises the former industrial mill complex ('Cleeves') situated on the northern side of the River Shannon, Limerick City and occupies the area between; Stonetown Terrace Road to the northeast; O'Callaghan Strand to the southeast; Condell Road (R527) to the southwest; and, Salesian Primary School and the 'Fernhill' residential estate to the northwest and west respectively - all situated in the townland of Farranshone More in Limerick City. The site is dissected by North Circular Road where it extends between Shelborne Road Lower and O'Callaghan Strand. The full extent of the planning application site is detailed in Figure 2.

Figure 2: Site Location (Background image: Google Satellite)

3. Design Targets

The Cleeves Riverside Quarter will be developed as an energy efficient residential space, guided by sustainable design principles. In line with the objectives of the Limerick City and County Development Plan and aligned with national and EU policy, the development will integrate advanced energy efficiency measures and incorporate efficient, low-carbon, and renewable energy technologies.

EU legislation governing the built environment imposes ambitious targets for energy savings and low-emissions energy generation, supporting broader environmental priorities including climate action, reduced air and water pollution, and improved public health. The design for the Cleeves Riverside Quarter will reflect these priorities, delivering a low-energy and low-carbon built environment.

The scheme will minimise energy demand for heating and ventilation through state-of-the-art energy-efficient technologies and renewable solutions, including air-source and water-source heat pumps, heat recovery mechanical ventilation, low-energy lighting, and rooftop solar photovoltaic (PV) systems. Additionally, the design will include controls and metering where appropriate to optimise energy use and reduce unnecessary consumption. The following sections outline the key guidance and design targets that apply to the design.

3.1 Limerick City & County Council Development Plan 2022–2028

The Limerick City & County Council Development Plan 2022–2028 aims to improve the energy efficiency, reduce greenhouse emissions and develop Limerick as a climate resilient region.

Policy Chapter 11.7 “Climate Action” outlines that “Applications of 1000+ sq.m. commercial development or applications of 30+ residential units shall include an Energy Statement setting out what energy efficiency and carbon reduction design measures are being considered”.

Policy Chapter 9 of the Development Plan contains comprehensive guidance regarding sustainable design principles by which development proposals for the county will be assessed. To ensure that future development integrates the principles of energy efficiency in the built environment and the use of efficient and renewable sources of energy, all applications for significant new developments are required to submit an Energy Statement. Section 4 outlines the energy reduction strategies considered and applied to improve the energy efficiency of the development.

Section 5 summarises the inputs and results of the DEAP analysis.

3.2 Part L 2022 - Dwellings

A key design driver is to achieve compliance with Part L 2022 for Dwellings (incorporating nZEB requirements) of the Building Regulations. Delivering buildings which will be cost effective and easy to own, occupy, control, and maintain is also fundamental to the design.

Low emissions energy supply is a key part of building a sustainable future and specifically tackling key environmental issues such as climate change, water pollution and air pollution. EU legislation for the built environment is designed to contribute to this by setting energy saving and low carbon energy generation targets for buildings.

The buildings will be designed to operate as low energy & low carbon buildings. This will be achieved through various energy efficiency measures that minimise heating, cooling, and mechanical ventilation loads. Controls, where appropriate, and metering can also help to reduce unnecessary energy consumption.

The current Building Regulation for Conservation of Fuel and Energy in dwellings is *Part L 2022 for Dwellings*. The current revision includes the recast Energy Performance of Buildings Directive and Energy Efficiency Directive S.I. 426 2014, which sets new targets for building energy performance including a move towards "Near Zero Energy Buildings" (nZEB). This requires a study of the technical, environmental, and economic feasibility of installing high efficiency alternative energy systems.

The directive states that the definition of a Nearly Zero Energy Building is:

"…a building that has a very high energy performance, as determined in accordance with Annex 1. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources provided onsite or nearby".

The permissible technologies allowed by SEAI include the following:

Figure 3: SEAI Part L Permissible Technologies

To satisfy that a building achieves Part L compliance, the following criteria must be met for new dwellings i.e., the New Build Apartments, Townhouses and Student Accommodation:

- The calculated Carbon Performance Coefficient (CPC) should be no greater than the Maximum Permitted Carbon Performance Coefficient (MPCPC) of 0.35
- The calculated Energy Performance Coefficient (EPC) should be no greater than the Maximum Permitted Energy Performance Coefficient (MPEPC) of 0.30.
- The calculated Renewable Energy Ratio (RER) should be greater than 0.2.
- The calculated Energy Performance should be no greater than the limiting value of 125 kWh/m^2/yr.
- As per the Department of Housing Authority in Ireland a minimum BER of A2 for new dwellings should be achieved.

4. Energy Strategy Overview

This section introduces all the energy strategies considered for the project starting with energy reduction strategies, then energy supply strategies and renewable energy strategies. While not all of the strategies presented here have been adopted, they are all presented along with their limitations and application considerations for this project.

4.1 Energy Reduction Strategies

4.1.1 Passive Solar

Glazing plays an important role in terms of light and heat energy usage. Generally, an increase in glazing reduces the need for artificial lighting. Particularly in dwellings where natural light alone is often sufficient throughout the day. The amount of glazing used is also a primary factor affecting the amount of solar gain a building will experience. Solar gain can be used to reduce space heating loads and lighting loads, as the heat gain from glazing can contribute significantly towards the space heating requirements of a building and the lighting requirements of occupied spaces.

However, it is also important to consider the role solar gain can play in overheating, as well as the extent of heat loss occurring in areas with a large amount of glazing. It is therefore good practice to maximise the use of natural daylight to enhance visual comfort, while also ensuring that thermal performance is not compromised.

To ensure no overheating occurs, an appropriate g-value will be provided, specifying the amount of solar energy transmittance via the glazing. An appropriate U-value is also provided to ensure heat loss via the glazing is kept to an appropriate level.

4.1.2 Building Fabrics

Limitation of heat loss through the fabric of the building is a significant aspect of Part L regulations. Heat loss through the building fabric is minimised by increasing the thermal insulation to a level which is deemed to be acceptable. U-value is the criteria used to measure such heat loss, where U-value is a measurement of the conductivity of building fabric elements.

The proposed U-values given in Section 5 are equal to or lower than the limiting values stated in Part L 2022 for Dwellings. The proposed values were obtained through the DEAP assessment carried for this development. Results of this assessment are presented later in this report.

4.1.3 Thermal Bridging

A thermal bridge, also known as a cold bridge, is an area of a building construction which has a significantly higher heat transfer than the surrounding materials. This is typically where there is either a break in the insulation, less insulation or the insulation is penetrated by an element with a higher thermal conductivity (i.e. around windows, doors and other wall openings, at junctions between elements and other locations).

Acceptable Construction Details will be adopted for all key junctions where appropriate (i.e. typical/standard junctions). All bespoke key junction details which have been certified by a third-party certification body (such as Agrément or equivalent) will be used or calculated by an NSAI registered thermal modeller.

Heat loss due to thermal bridging is expressed as a multiplier of the total exposed surface area in DEAP calculations. The proposed design value is 0.08 W/m^{2}K for the New Build Apartments and Townhouses.

4.1.4 Building Envelope Air Permeability

Air permeability should be limited in new buildings to reduce uncontrolled ventilation and associated heat losses. This can be facilitated by adopting standard details to form the appropriate air barrier elements (i.e. plaster, vapour control layer, breather membrane) and a regular on-site inspection regime will have to be in place throughout the construction period to ensure that the air barrier is maintained.

Part L 2022 for Dwellings requires an air permeability level of no greater than 5m³/m²/hr @ 50Pa for a new dwelling; the design intent for the proposed dwellings will be to have an air permeability target of 3m³/m²/hr @ 50Pa for the New Build Apartments, Townhouses and Student Accommodation.

4.1.5 Light Fittings

It is proposed that all light fittings are to be specified as being low-energy lights, reducing the energy requirement of artificial lighting. LED are the proposed fitting type throughout the apartments to achieve energy performance and to achieve alignment with CIBSE lighting guidance.

4.1.6 Insulation Of Pipes, Ducts & Vessels

All hot water storage vessels and pipes will be fully insulated. Hot water storage vessels shall have a minimum of 50mm factory installed insulation. All water pipes shall be insulated throughout the building. This will improve energy performance and help protect against legionella and freezing.

4.1.7 Heating Controls

Heating systems should be effectively controlled to ensure the efficient use of energy. It is intended that the system will minimise energy requirements by meeting user requirements closely while not exceeding them.

Heating and hot water level of controls will comply with the minimum control requirements stated in Part L 2022 for Dwellings.

4.1.8 District Heating

District heating was explored as part of a proposed integrated, site-wide thermal energy strategy. The concept included a district heating and cooling network connected to a central energy centre located between the protected water storage tank and the reservoir. This system would require forward planning for an Energy Services Company (ESCo) to take ownership and manage the thermal network.

While a district heating system has not been included into the current scheme it would be possible to integrate at a later stage subject to alterations of ground floor spaces.

4.2 Renewable Energy Sources

Within this section of the report, various energy source technologies are examined. The feasibility and suitability of each option is evaluated, based on the location of the site, the nature of the development, economic criteria, functionality, efficiency, and the sustainability of the system in question.

There is a requirement for the development that a proportion of energy sources used are renewable technologies. The minimum requirements, as set out Part L 2022 for Dwellings are that the minimum Renewable Energy Ratio (RER) is equal to or above 0.2.

A RER of 0.2 represents 20% of the primary energy of the building is served from renewable energy technologies relative to the total primary energy of the building, as defined and calculated in DEAP.

Potential energy sources were analysed based on the requirements of Part L 2022 for Dwellings and their applicability to this development. The systems assessed include:

- Photovoltaics
- Solar Water Heating
- Air Source Heat Pumps

4.2.1 Photo-Voltaic

Photo-voltaic (PV) panels convert the sun's energy to electricity using semiconductor technology. PV panels are a renewable energy option which could operate alongside a boiler system, for instance.

- Apartments

PV panels are installed as part of the project's renewable energy strategy to serve the residential apartments. The PV system is not included in the DEAP (Dwelling Energy Assessment Procedure) calculations because it is designed to supply electricity to the residential blocks collectively, including common areas, rather than being allocated to individual apartments; a requirement for DEAP inclusion. The PV installation also does not fully meet the total energy demand of each apartment.

Under DEAP guidelines, only renewable energy systems that are specifically assigned and metered to individual dwellings, and that supply a significant portion of their energy demand, can be included in the assessment. While the apartment PV system reduces overall site-wide energy demand and carbon emissions, it does not directly affect individual apartment BER ratings under the current DEAP methodology.

- Townhouses

For the Stonetown Townhouses, the plans indicate 9 panels per dwelling; based on their size, these would be 400 W each and are expected to generate approximately 2,600 kWh per year. As these PV systems are dedicated to and serve each individual house, they will be included in the DEAP assessment.

Figure 4: Photovoltaic Panels Example

4.2.2 Solar Water Heating

Solar panels may be used to provide the domestic hot water for the buildings. A potential for high maintenance frequency is a factor in not considering solar water heating a viable option. In the context of utilising heat pumps, solar water heating is counter-productive and not considered a viable technology.

Figure 5: Solar Water Heating Panels Example

4.2.3 Air Source Heat Pumps

An ‘Air Source Heat Pump’ is a system which utilises a refrigeration cycle to transfer heat from the outside air (or other air source) to the inside of a building, or vice-versa. This has been deemed to be the most suitable technology for each of the building and is described in greater detail below

4.3 Heat Pumps

4.3.1 New Apartments (O’Callaghan Strand, Salesians and Stonetown)

The new residential apartments will be de-centralised building-by-building. There will be a central, roof mounted air-to-water source heat pump on each apartment building and individual water-to-water pumps within each dwelling.

The water-to-water pump provides primary space heating using radiators that serve the living spaces, bathrooms and bedrooms.

The water-to-water pump will also generate hot water to a suitable temperature for Domestic Hot Water (DHW) which can be stored within a built-in storage tank.

The water-to-water pump will be located inside the utility cupboard of each apartment.

The ventilation needs to be provided separately. Dedicated Mechanical Ventilation Heat Recovery (MVHR) systems will be utilised in each apartment to provide mechanical ventilation. The toilets and kitchen will also have separate dedicated extract fans.

A MVHR system provides outdoor filtered air into a dwelling whilst retaining most of the energy that has already been used in heating the building. It works on the principle of extracting air from the wet rooms (WCs, kitchens, etc) and supplying air into the occupied rooms (living area, bedrooms, etc).

4.3.2 Triplexes and Townhouses (Salesians and Stonetown)

A local air source heat pump system in combination with a Mechanical Ventilation Heat Recovery (MVHR) system per dwelling is proposed for the Triplexes and Townhouses.

The air source heat pump system will consist of an outdoor and indoor unit connected by refrigerant pipework. The outdoor unit will be located in a well-ventilated outdoor area.

The indoor unit typically located in a utility cupboard, will transfer heat from the refrigerant fluid to the water circuit. This hot water will then serve the radiators, in addition to hot water within a separate storage tank, which will utilise an immersion to bring the water to a suitable temperature for DHW use.

The ventilation will be provided separately through an MVHR system, with dedicated extract fans for the toilets and kitchens.

4.3.3 Student Accommodation (Quarry)

The new student accommodation will be a centralised system. There will be an air-to-water source heat pump for each student block, providing the primary space heating through radiators which serve the living spaces, bathrooms and bedrooms.

Water-to-water pumps within each building block will generate hot water to a suitable temperature for Domestic Hot Water (DHW), which will be stored in a separate central storage tank.

The ventilation will be provided separately through an MVHR system, with dedicated extract fans for the toilets and kitchens.

4.4 Electric Vehicle Charging Strategy

A number of EV charging solutions are to be incorporated across the development to ensure compliance with the current building regulations, LCC requirements and to future proof the development for a “no fossil fuel” transportation strategy.

Basic building regulations compliance requires incorporating the requirements of the current editions of TGD L in a manner that ensures little to no civils works would be involved in fitting out all the relevant parking spaces across the development with car charging points:

As per section 1.4.6.1 of TGD L Dwellings 2022:

1.4.6.1 For a new building (containing one, or more than one, dwelling), ducting infrastructure, consisting of conduits for electric cables, should be provided for every parking space, to enable the subsequent installation of recharging points for electric vehicles…

In addition to TGD L, the Limerick Development Plan 2022 – 2028 and ZEVI Guidelines must also be incorporated:

11.8.6 EV Charging Points

Infrastructure for Electric Vehicles will be integrated into developments in line with national requirements as follows:

Table DM 11 EV Charging Points Requirements

Development Category	EV Charging Points
Residential multi-unit developments both new buildings and buildings undergoing major renovations (with private car spaces including visitor car parking spaces)	A minimum of 1 EV Charge Point space per five car parking spaces (ducting for every parking space shall be provided)
New dwellings with in-curtilage car parking	Installation of appropriate infrastructure to enable installation of recharging point for EVs
Non-residential developments (with private car parking spaces including visitor car parking spaces with more than 10 spaces e.g. office developments)	Provide at least 1 recharging point, and a minimum of 1 space per 5 car parking spaces should be equipped with one fully functional EV Charging Point
Developments with publicly accessible spaces (e.g. supermarket car park, cinema etc.)	Provide at least 1 recharging point, and a minimum of 1 space per 5 car parking spaces should be equipped with one fully functional EV Charging Point

- The Council will liaise with other agencies to secure the retrospective provision of EV Charging Points within the public realm of settlements where appropriate.

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Figure 6: Limerick Development Plan 2022-2028

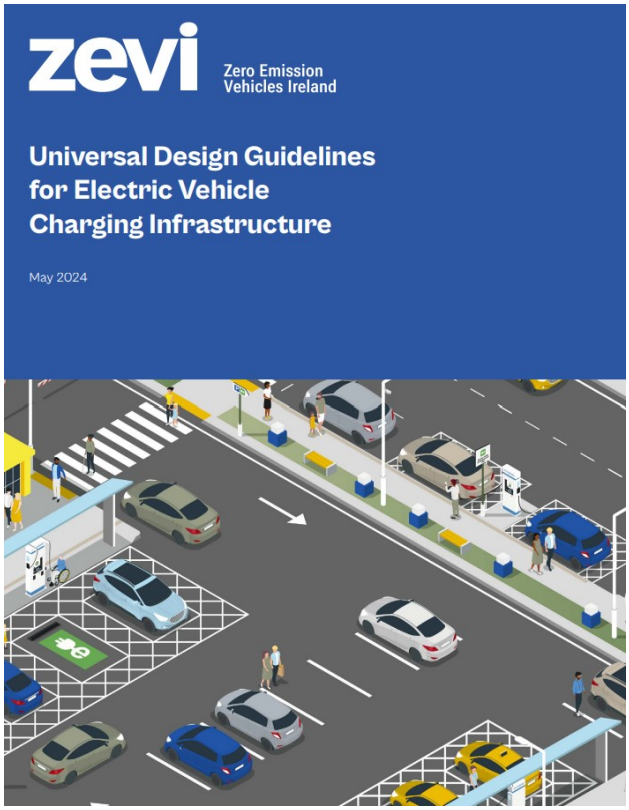

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Figure 7: ZEVI EV Design Guidelines

4.4.1 Internal Parking Associated with a Residential Block

For underground residential parking spaces such as those associated with the Salesians units the infrastructure is to be installed for all of these spaces to have a domestic grade 7.4kW charging unit installed in the future when requested by the relevant tenant as well as day one charge points to be installed for 20% of the total spaces, this is to take the form of:

- A suitably sized dedicated ESB meter is to be installed in the main metering panel and a supply cable routed to the carpark area terminated into a new a dedicated car charging distribution board. The ESB meter, submain cable and distribution board are all to be sized to cater for the future expansion of having EV chargers at all parking spaces.
- Cable containment is the be installed from this future board location in a ring covering the outer perimeter of the parking spaces to allow cabling for power and data to be routed easily to feed the car chargers.
- Space is to be left to allow for wall mounted or ceiling suspended charging points to be installed.
- The car charging points are to be installed and managed by a dedicated car charging company in agreement with the site Management Company. The charging points to have RFID control to allow for billing to the relevant users and as such the installation of double head car charging points with individual RFID controls is allowable where this makes commercial sense.

Figure 8: Typical wall mounted car domestic car charger

Figure 9: Typical ceiling suspended domestic car charger

4.4.2 External Parking Associated with a Residential Block

Where parking spaces are external to the residential development, such as for Stonetown Terrace, the infrastructure is to be installed to allow all these spaces to have a car charging pillar installed in the future in addition to 20% of the parking spaces having day one chargers installed, this infrastructure is to take the form of:

- Double height metered ESB pillars located centrally along a run of parking spaces to allow for future fitout of charging switchgear by a dedicated car charging company, MIC to be calculated based on maximum number of spaces that could be fed from the particular pillar.
- 100mm public lighting grade corrugated underground ducting with access chambers routed out from the double height pillar to feed future charging pillars.
- 100x100 lidded chamber on edge of footpath or surrounded by a suitable concrete base where on a green area at each proposed future car charging pillar location, lid to be fully detachable and linked to a local 600x600 access chamber with a 100mm PL duct. Feeder duct to be routed to avoid clash with anchor bolts for future pillar.

Figure 10: Typical Double head EV charging pillars and double height ESB metered pillar

4.4.3 Public Car Charging Infrastructure

An EV fast charging hub is proposed to be constructed in the Shipyard parking area; this would consist of 5 No. of parking spaces with DC fast chargers capable of delivering a minimum speed of 22kW via CCS connectors.

The public charging hub is the be fully developed at detailed design stage and incorporating the guidance of ZEVI Universal Design Guidelines for Electric Vehicle Charging Infrastructure, a charge station operator will also need to be brought on board to operate the hub.

Figure 11: Typical fast charging hub

4.4.4 Public Bike/Scooter Charging & Rental Infrastructure

The detailed design stage is to include engagement with TFI Bikes to facilitate the installation of bike rental pillars in the Shipyard area and any other viable locations across the site such as adjacent the Quarry student accommodation block. Engagement should include facilitation of infrastructure for charging for future E-bike and E-Scooter rental units.

© Google Streetview

Figure 12: Existing TFI Bikes installation on O'Callaghan Strand

Public charging infrastructure for privately owned e-bikes or e-scooters is currently not foreseen as required, these units typically have a fully charged range of 30km which would be sufficient for any typical round trip in the city and most of these would require the owner to carry the charger unit with them to charge away from home.

5. Energy Analysis

5.1 DEAP Analysis

The conditions outlined above have been used to carry out DEAP assessments to ensure that all apartments and townhouses comply with EPC and CPC limitations and ultimately Part L 2022 for Dwellings.

The preliminary DEAP calculations have been carried out for the different typical apartments, townhouses, and student accommodation units, focusing on those layouts and orientations deemed to represent worst-case scenarios for each typology. These cases were selected based on factors such as higher solar gains and higher external wall area, both of which can negatively impact energy performance. By modelling these more challenging configurations using SEAI's most recent DEAP version 4.2 software, compliance can be demonstrated under the most demanding conditions. It is therefore expected that all other units which are benefiting from more advantageous orientations/shading or reduced exposed surface area will achieve equal or better performance outcomes.

The samples used for the assessment were:

1. New Build Apartments: Salesians Unit 02 & O'Callaghan Strand (OCS) Unit 01
2. New Townhouses: Stonetown Terrace 3B5P Townhouse
3. New Student Accommodation: Quarry Room Type 02.

5.1.1 DEAP Inputs

The DEAP assessment was carried out based on the proposed values, which are detailed in Table 1, Table 2 and Table 3.

Table 1: DEAP Assessment Input Values New Build Apartments (Salesians/OCS)

Input Parameter	Input Value
Flat Roof U-Value	0.13 W/m^{2}K
Walls U-Value	0.14 W/m^{2}K
Ground / Exposed Floors U-Value	0.13 W/m^{2}K
External Glazing U-Value	1.1 W/m^{2}K
Structural Air Permeability	1 m^3/m^2/hr at 50Pa
Thermal Bridging	0.04 W/m^{2}K
Thermal Massing Category	Medium-high
Lighting	LED
Ventilation Method	Balanced whole-house mechanical ventilation with heat recovery with separate extract for toilets and kitchen
Specific Fan Power	0.69 W/(L/s)
Heat Exchanger Efficiency	80%

Input Parameter	Input Value
Space Heating System	Central air-to-water heat pump (Seasonal Efficiency = 335%) combined with individual water-to-water heat pumps (Seasonal Efficiency = 292.2%). Includes Time and Temperature Control with Load Compensation.
DHW System	Water-to-water heat pumps (Water Heating Seasonal Efficiency = 292.2%)
DHW Storage Volume	180 L, Manufacturers declared losses 1.2kWh/day. Storage in an Airing Cupboard
PV Delivered Energy (kWh/y)	N/A

Table 2: DEAP Assessment Input Values New Townhouses (Stonetown Terrace 3B5P Townhouse)

Input Parameter	Input Value
Pitched Roof U-Value	0.13 W/m^{2}K
Walls U-Value	0.14 W/m^{2}K
Ground / Exposed Floors U-Value	0.13 W/m^{2}K
External Doors U-Value	1.1 W/m^{2}K
External Glazing U-Value	1.1 W/m^{2}K
Structural Air Permeability	1.1 m^3/m^2/hr at 50Pa
Thermal Bridging	0.04 W/m^{2}K
Thermal Massing Category	Medium-high
Lighting	LED
Ventilation Method	Balanced whole-house mechanical ventilation with heat recovery with separate extract for toilets and kitchen
Specific Fan Power	0.69 W/(L/s)
Heat Exchanger Efficiency	80%
Space Heating System	Air-to-water heat pump (Seasonal Efficiency = 341%)
DHW System	Immersion heater
DHW Storage Volume	170 L, Manufacturers declared losses 1.92kWh/day.

Input Parameter	Input Value
PV Delivered Energy (kWh/y)	2,600

Table 3: DEAP Assessment Input Values New Student Accommodation (Quarry Room Type 02)

Input Parameter	Input Value
Flat Roof U-Value	0.13 W/m^{2}K
Walls U-Value	0.14 W/m^{2}K
Ground / Exposed Floors U-Value	0.13 W/m^{2}K
External Glazing U-Value	1.1 W/m^{2}K
Structural Air Permeability	1 m^3/m^2/hr at 50Pa
Thermal Bridging	0.04 W/m^{2}K
Thermal Massing Category	Medium-high
Lighting	LED
Ventilation Method	Balanced whole-house mechanical ventilation with heat recovery with separate extract for toilets and kitchen
Specific Fan Power	0.60 W/(L/s)
Heat Exchanger Efficiency	85%
Space Heating System	Central air-to-water heat pump (Seasonal Efficiency = 350%) Includes Time and Temperature Control with Load Compensation.
DHW System	Central water-to-water heat pumps (Seasonal Efficiency = 327%).
DHW Storage Volume	170 L, Manufacturers declared losses 1.0kWh/day. Includes cylinder thermostat.
PV Delivered Energy (kWh/y)	N/A

5.1.2 DEAP Outputs Summary

The results of the DEAP assessment outlined in Table 4 below have been extracted from DEAP Part L reports. Please refer to the Appendices for details on these reports.

Table 4: Assessment Output Values New Build Apartment, Townhouse and Student Accommodation

	EPC	CPC	RER	Size (m^2)	BER	Compliance
Part L Requirement	**<0.300**	**<0.350**	**>0.2**	**--**	**A2**	**--**
Apartment (Salesians Unit 02)	0.157	0.104	0.44	54.3	A2	Yes
Apartment (OCS Unit 01)	0.146	0.095	0.42	88.5	A2	Yes
Townhouse (Stonetown Terrace 3B5P Townhouse)	0.040	0.025	0.893	108.6	A1	Yes
Student Accom. (Quarry Room Type 02)	0.18	0.12	0.375	27.8	A2	Yes

6. Conclusions

This report verifies that the energy performance of The Cleeves Riverside Quarter has been designed to meet or exceed all statutory requirements, as well as the specific performance objectives set out in the project brief. In alignment with the Energy Statement, the development integrates key principles of energy efficiency and incorporates high-performance building systems to optimize operational energy consumption. The energy strategy includes the deployment of renewable energy technologies, such as a photovoltaic (PV) panel array, alongside high-efficiency heat recovery and heat pumps for heating. These measures contribute to a low-carbon energy profile, enhancing overall sustainability and reducing reliance on fossil fuels.

To assess and verify the building's performance, a DEAP (Dwelling Energy Assessment Procedure) analysis has been undertaken in line with residential energy performance standards. The results confirm full compliance with Part L of the Irish Building Regulations and demonstrate that the development meets the Nearly Zero Energy Building (NZEB) standard for residential buildings.

The provisional results convey that the development is fully compliant with Part L of the Irish Building Regulations and meets the Nearly Zero Energy Building (NZEB) standard. Furthermore, based on the current design, the residential apartment units are expected to achieve A2 Building Energy Ratings (BERs), and the townhouses are projected to achieve A1 BERs, demonstrating strong operational energy efficiency.

Appendix A

A.1 New Build Apartments Part L Report

DRAFT watermarks have been used on the Part L report as only provisional BER ratings can be reported at this stage.

Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Top-floor apartment	**Type of BER rating**	New Dwelling - Provisional
Address line 1	Cleeves Riverside Quarter	**Year of Construction**	2025
Address line 2	O'Callaghan Strand	**Date of Assessment**	12/08/2025
Address line 3	Limerick	**Date of Plans**	20/06/2025
County	Limerick City	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	
Purpose of Rating	Private letting	**Is MPRN shared with another dwelling?**	No
Assessor Name			
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	88.50	3.50	309.75
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	88.50		309.75

Living Area [m^2]	30.00	**Living area percentage [%]**	33.90
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	0	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	1
Ventilation method	Balanced whole-house mechanical ventilation with heat recovery	**Mechanical Ventilation Manufacturer**	DUCOBOX
Specific fan power [W/(L/s)]	0.690	**Mechanical Ventilation Model Name**	Energy Comfort 325
Heat exchanger efficiency [%]	80.00	**How many wetrooms (incl. kitchen)?**	2

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^{2}K]	Area [m^2]
Non-Heat Loss Floor	Apartment Floor	N/A	0	88.5

Building Elements - Roof Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
Flat Roof		0.13	88.5

Building Elements - Wall Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
Unknown	External Wall	0.14	67.67

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^{2}K]	Area [m^2]

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 = 0.2, hard coat)	Yes	1.100	2.700
Double-glazed, air filled (low-E, en = 0.2, hard coat)	Yes	1.100	2.700

Other Details

Thermal bridging factor [W/m²k]	0.0400	**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	0	**Combi boiler present?**	No
Supplementary electric water heating	No	**Water Storage Volume [L]**	180
Hot water storage manufacturer and model name	Daikin EWSA(H/X)-D9W	**Declared loss factor [kWh/d]**	1.20
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	None		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	0	**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 [%]	521.48	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	292.19	**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/m^2/yr**	**25.81**
CO_2 emissions [kg/m^2/yr]	3.3		
EPC	0.146	**EPC Pass/Fail**	**Pass**
CPC	0.095	**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**	0.13	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.14	Pass
Flat Roof	0.13	Pass	**Floors**	0	Pass
Floors with no underfloor heat	0.00	Pass	**External doors / windows / rooflights**	1.10	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.14	Pass			
Percentage of opening areas [%]	30.51				
Average U value of openings	1.10	Pass			
Permeability test carried out and meets guidelines in TGD L				0.05 | Pass	

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.00	0.00	
+ Delivered energy	Other	0.00	0.00	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.00	0.00	
+ Delivered energy	Biodiesel	0.00	0.00	
+ Delivered energy	Bioethanol	0.00	0.00	
+ Environmental energy	HP	1653.61	1653.61	
+ Saved energy	CHP	0.00	0.00	
+ District heating	District Heating	0.00	0.00	
+ Delivered energy	Grid	0.00	2284.37	
+ Delivered energy	Thermal	0.00	0.00	
SUBTOTAL		1653.61	3937.98	0.42 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.00	0.00	
TOTAL		1653.61	3937.98	0.42

Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Top-floor apartment	**Type of BER rating**	New Dwelling - Provisional
Address line 1	Cleeves Riverside Quarter	**Year of Construction**	2025
Address line 2	O'Callaghan Strand	**Date of Assessment**	30/07/2025
Address line 3	Limerick	**Date of Plans**	20/06/2025
County	Limerick City	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	
Purpose of Rating	Private letting	**Is MPRN shared with another dwelling?**	No
Assessor Name			
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	54.30	3.08	167.24
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	54.30		167.24

Living Area [m^2]	23.40	**Living area percentage [%]**	43.09
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	0	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	1
Ventilation method	Balanced whole-house mechanical ventilation with heat recovery	**Mechanical Ventilation Manufacturer**	DUCOBOX
Specific fan power [W/(L/s)]	0.690	**Mechanical Ventilation Model Name**	Energy Comfort 325
Heat exchanger efficiency [%]	80.00	**How many wetrooms (incl. kitchen)?**	2

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^{2}K]	Area [m^2]
Non-Heat Loss Floor	Apartment Floor	N/A	0	54.3

Building Elements - Roof Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
Flat Roof		0.13	54.3

Building Elements - Wall Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
Unknown	External Wall	0.14	40.2

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^{2}K]	Area [m^2]

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 = 0.2, hard coat)	Yes	1.100	5.020

Other Details

Thermal bridging factor [W/m²k]	0.0400	**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	0	**Combi boiler present?**	No
Supplementary electric water heating	No	**Water Storage Volume [L]**	180
Hot water storage manufacturer and model name	Daikin EWSA(H/X)-D9W	**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	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	0	**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 [%]	611.31	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	292.19	**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/m^2/yr**	**30.71**
CO_2 emissions [kg/m^2/yr]	3.93		
EPC	0.157	**EPC Pass/Fail**	**Pass**
CPC	0.104	**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**	0.13	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.14	Pass
Flat Roof	0.13	Pass	**Floors**	0	Pass
Floors with no underfloor heat	0.00	Pass	**External doors / windows / rooflights**	1.10	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.14	Pass			
Percentage of opening areas [%]	18.49				
Average U value of openings	1.10	Pass			
Permeability test carried out and meets guidelines in TGD L				0.05 | Pass	

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.00	0.00	
+ Delivered energy	Other	0.00	0.00	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.00	0.00	
+ Delivered energy	Biodiesel	0.00	0.00	
+ Delivered energy	Bioethanol	0.00	0.00	
+ Environmental energy	HP	1309.94	1309.94	
+ Saved energy	CHP	0.00	0.00	
+ District heating	District Heating	0.00	0.00	
+ Delivered energy	Grid	0.00	1667.62	
+ Delivered energy	Thermal	0.00	0.00	
SUBTOTAL		1309.94	2977.56	0.44 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.00	0.00	
TOTAL		1309.94	2977.56	0.44

Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

A.2 Townhouse Dwelling Part L Report

DRAFT watermarks have been used on the Part L report as only provisional BER ratings can be reported at this stage.

Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	End of terrace house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	Cleeves Riverside Quarter	**Year of Construction**	2025
Address line 2	O'Callaghan Strand	**Date of Assessment**	24/06/2025
Address line 3	Limerick	**Date of Plans**	20/06/2025
County	Limerick City	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	
Purpose of Rating	Private letting	**Is MPRN shared with another dwelling?**	No
Assessor Name			
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	36.20	2.85	103.17
First Floor	36.20	2.85	103.17
Second Floor	36.20	5.44	196.93
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	108.60		403.27

Living Area [m^2]	16.80	**Living area percentage [%]**	15.47
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	0	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	1
Ventilation method	Balanced whole-house mechanical ventilation with heat recovery	**Mechanical Ventilation Manufacturer**	Vent Axia
Specific fan power [W/(L/s)]	0.690	**Mechanical Ventilation Model Name**	Kinetic 200ZH
Heat exchanger efficiency [%]	80.00	**How many wetrooms (incl. kitchen)?**	2

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^{2}K]	Area [m^2]
Exposed / Semi Exposed	GF	No	0.13	36.2
Non-Heat Loss Floor	L01	N/A	0	36.2
Non-Heat Loss Floor	L02	N/A	0	36.2

Building Elements - Roof Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
Pitched Roof - Insulated on Rafter		0.13	36.2

Building Elements - Wall Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
300mm Filled Cavity	N Ex Wall	0.14	91.84
300mm Filled Cavity	W Ex Wall	0.14	38.63
300mm Filled Cavity	E Ex Wall	0.14	37.43

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^{2}K]	Area [m^2]
External Door	1	1.1	2.000

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	1.100	6.160
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	1.100	7.300
Double-glazed, air filled (low-E, en = 0.15, hard coat)	Yes	1.100	8.140

Other Details

Thermal bridging factor [W/m²k]	0.0400	**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	0	**Combi boiler present?**	No
Supplementary electric water heating	No	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	Dimplex System H6: HTi6 170 MS	**Declared loss factor [kWh/d]**	1.92
Temperature factor unadjusted	0.6	**Temperature Factor Multiplier**	1
Primary Circuit loss type	Electric immersion heater		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	**Control Category**	2	**Responsiveness category**	1
Central heating pumps	0	**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 [%]	341	**Space heating efficiency adjustment factor**	0.7000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	154.65	**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/m^2/yr**	**7.26**
CO_2 emissions [kg/m^2/yr]	0.93		
EPC	0.040	**EPC Pass/Fail**	**Pass**
CPC	0.025	**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**	0.13	Pass
Pitched roof insulated on slope	0.13	Pass	**Walls**	0.14	Pass
Flat Roof	0	Pass	**Floors**	0.13	Pass
Floors with no underfloor heat	0.13	Pass	**External doors / windows / rooflights**	1.10	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.14	Pass			
Percentage of opening areas [%]	23.57				
Average U value of openings	1.10	Pass			
Permeability test carried out and meets guidelines in TGD L				0.05 | Pass	

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	4550.00	4550.00	
+ Delivered energy	Other	0.00	0.00	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.00	0.00	
+ Delivered energy	Biodiesel	0.00	0.00	
+ Delivered energy	Bioethanol	0.00	0.00	
+ Environmental energy	HP	2047.66	2047.66	
+ Saved energy	CHP	0.00	0.00	
+ District heating	District Heating	0.00	0.00	
+ Delivered energy	Grid	0.00	788.61	
+ Delivered energy	Thermal	0.00	0.00	
SUBTOTAL		6597.66	7386.27	0.89 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.00	0.00	
TOTAL		6597.66	7386.27	0.89

Energy Requirements: Renewables

	Type	Part L Total Contribution [kWh/y]	Delivered Energy [kWh/y]	Primary energy conversion factor	CO_2 emission factor [kg/kWh]
Energy produced or saved 1	Electrical (Solar PV/Wind)	0.000	2600.000	1.75	0.224
Energy consumed by the technology 1			0.000	0.00	0.000
Energy produced or saved 2	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 2			0.000	0.00	0.000
Energy produced or saved 3	N/A	0.000	0.000	0.00	0.000
Energy consumed by the technology 3			0.000	0.00	0.000

Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

A.3 Student Accommodation Part L Report

DRAFT watermarks have been used on the Part L report as only provisional BER ratings can be reported at this stage.

Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Top-floor apartment	**Type of BER rating**	New Dwelling - Provisional
Address line 1	Cleeves Riverside Quarter	**Year of Construction**	2025
Address line 2	O'Callaghan Strand	**Date of Assessment**	23/07/2025
Address line 3	Limerick	**Date of Plans**	20/06/2025
County	Limerick City	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	
Purpose of Rating	Private letting	**Is MPRN shared with another dwelling?**	No
Assessor Name			
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	27.80	3.15	87.57
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	27.80		87.57

Living Area [m^2]	25.20	**Living area percentage [%]**	90.65
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	0	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	Yes	**Number of sides sheltered**	1
Ventilation method	Balanced whole-house mechanical ventilation with heat recovery	**Mechanical Ventilation Manufacturer**	
Specific fan power [W/(L/s)]	0.600	**Mechanical Ventilation Model Name**	
Heat exchanger efficiency [%]	85.00	**How many wetrooms (incl. kitchen)?**	2

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^{2}K]	Area [m^2]
Non-Heat Loss Floor	Apartment Floor	N/A	0	27.8

Building Elements - Roof Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
Flat Roof		0.13	27.8

Building Elements - Wall Details

Type	Description	U-Value [W/m^{2}K]	Area [m^2]
300mm Filled Cavity	External Wall	0.14	17.37

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^{2}K]	Area [m^2]

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	1.100	3.050

Other Details

Thermal bridging factor [W/m²k]	0.0400	**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	0	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	-	**Declared loss factor [kWh/d]**	1.00
Temperature factor unadjusted	0.6	**Temperature Factor Multiplier**	0.9
Primary Circuit loss type	None		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	0	**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 [%]	350	**Space heating efficiency adjustment factor**	0.7500	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	327	**Water heating efficiency adjustment factor**	0.7000	**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/m^2/yr**	**49.95**
CO_2 emissions [kg/m^2/yr]	6.39		
EPC	0.180	**EPC Pass/Fail**	**Pass**
CPC	0.120	**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**	0.13	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.14	Pass
Flat Roof	0.13	Pass	**Floors**	0	Pass
Floors with no underfloor heat	0.00	Pass	**External doors / windows / rooflights**	1.10	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.14	Pass			
Percentage of opening areas [%]	21.94				
Average U value of openings	1.10	Pass			
Permeability test carried out and meets guidelines in TGD L				0.05 | Pass	

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	PV/Wind	0.00	0.00	
+ Delivered energy	Other	0.00	0.00	
+ Delivered energy	Solar	0.00	0.00	
+ Delivered energy	Biomass	0.00	0.00	
+ Delivered energy	Biodiesel	0.00	0.00	
+ Delivered energy	Bioethanol	0.00	0.00	
+ Environmental energy	HP	833.13	833.13	
+ Saved energy	CHP	0.00	0.00	
+ District heating	District Heating	0.00	0.00	
+ Delivered energy	Grid	0.00	1388.59	
+ Delivered energy	Thermal	0.00	0.00	
SUBTOTAL		833.13	2221.72	0.37 - Pass
Energy not used in Regulated Loads	PV/Wind/CHP	0.00	0.00	
TOTAL		833.13	2221.72	0.37

Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224