Climate Action Energy Statement

For

Galway Port LRD

At

Galway Port

For

The Land Development Agency

Date of Issue: 06/08/2025 Version: 2.0

professional projects. professional engineering.

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Document History

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0.0	Draft Issue for Planning	KT	MOD/GW	25/07/2025
1.0	Updated to Climate Action Energy Statement	KT	MOD/GW	31/07/2025
2.0	Issued for Planning	KT	MOD/GW	06/08/2025

Contents

1. Executive Summary

Axiseng prepared this Climate Action Energy Statement to support the planning application for the proposed Galway Port LRD in Galway City. Established in 2004, Axiseng is an independent building services consulting engineering practice who represent our client's best interests in every aspect of our service with advice, designs and lifetime costs tailored to suit the specific mechanical, electrical and environmental needs of each individual project. Axiseng have in-house expertise in all aspects of building services and are recognised leaders in the fields of sustainable design, complex air conditioning installations and master-planning major developments.

The design strategy outlined within this report results in each sample apartment achieving a BER rating of A2; it will also meet full compliance with TGD Part L. Sample results can be found below. The systems applied to achieve compliance include:

- Centralised R290 Heat Pumps – efficiencies approved by SEAI for use in DEAP Assessment. The Community Heating Scheme will be designed to be suitable for future connection to the proposed city-wide Galway District Heating Scheme.
- Whole House Mechanical Ventilation with an SFP of 0.66 and Heat Recovery Efficiency of 88%
- Air Permeability of $3m^2/hr/m^2$
- A Y-factor of 0.15 W/m^2K (default) for thermal bridging, recommendation to improve on this for top floor apartments, where feasible, for EU Taxonomy
- Using low water use fixtures such as flow restrictors to limit the water usage to less than 125 litres/person/day and shower flow rates to 6 litres/min
- Using sufficient heating and domestic hot water controls to satisfy section 1.4.3 of Technical Guidance Document L 2022 (Dwellings).

For the landlord areas, radiators fed from the centralised air sourced heat pumps along with the below inputs will achieve compliance with TGD Part L – Buildings other than Dwellings. The results can be found below.

- Lighting designed at 110 Lumens/cWatt with PIR sensors throughout
- Variable speed pumps installed

The design intent is to follow the requirements of Energy Performance of Buildings Directive (EU/2024/1275, EPBD), Building Regulations Technical Guidance Document (TGD) Part L, Galway County Council Climate Action Plan 2024-2029, which supports renewable energy, promotes a circular economy, and aims to reduce carbon emissions in the county, aligning with national targets for climate neutrality and greenhouse gas reduction by 2050 and 2030, respectively. These are the current drivers for sustainable building design in Ireland to ensure low carbon energy and heating solutions have been considered as part of the overall design of the proposed development. Ireland's Climate Action Plan 2025 (CAP25) operationalises the national pathway toward a 51% emissions reduction by 2030, with specific measures for the built environment (fabric upgrades, heat pumps, renewables, and smart electrification).

Globally, the building and construction sector remain a major source of energy use and CO_2 emissions. The United Nations Environmental Programme (UNEP) Global Status Report for Buildings and Construction 2024/2025 highlight the need to accelerate efficiency, low-carbon heat and materials decarbonisation to keep sectoral emissions within 1.5°C-compatible pathway. This development's strategy responds directly to those priorities through demand reduction, heat pump electrification and embodied-carbon management.

To meet the target set out for the proposed development, the energy modelling software used in the analysis of Buildings other than Dwellings is IES <VE2024> which utilises the SBEMie 5.6.a.0 calculation engine for the Non-Domestic Energy Assessment Procedure (NEAP). The methodology used in the assessment of dwellings is the Dwelling Energy Assessment Procedure (DEAP) methodology.

Part L compliance has been achieved in all spaces, as detailed in the tables below. The development is targeting EU Taxonomy, and as such, the energy required must be at least 10% less than the NZEB threshold. This requires that the Energy Performance Coefficient (EPC) is improved by 10% from the baseline for both the dwellings and the non-dwelling spaces.

The landlord spaces all meet the requirements for EU Taxonomy as the energy performance is more than 10% of an improvement on the NZEB threshold.

Whilst one of the sample apartments does not fully meeting the requirements for EU Taxonomy on its own, this is a top floor north facing apartment with increased heat losses and reduced heat gains. When the total is taken of all the primary energy required for the sample apartments, this is less than 10% of the energy benchmark for NZEB for the sample apartments, which is the requirement for EU Taxonomy. Initial calculations for planning have been completed with the conservative default thermal bridging (y) factor (0.15), which may be improved upon during detailed design when the Architect's design has been completed.

The proposed grey-box spaces have notionally proposed systems included in this report which show they can all comply with Part L. Detailed design of these spaces and compliance with the regulations shall be required during their full fit out when space uses have been confirmed.

Compliance	Residential Part L Compliance (Sample Apartments)	Commercial Part L Compliance (Landlord Spaces)	Commercial Part L Compliance (Blocks A and B: Retail/Café/Creche)
Primary Energy (Actual) kWh/m^2.yr	28.67 – 45.89	19.58	33.2 – 175.91
Energy Performance Coefficient (EPC)	0.222 – 0.279	0.79	0.61 – 0.73
Maximum Permitted EPC (MPEPC)	0.3	1.0	1.0
Primary Energy Pass?	Yes	Yes	Yes
EU Taxonomy Maximum Permitted EPC (MPEPC)	0.27	0.9	0.9
Primary Energy EU Taxonomy Pass?	1 Apartment above threshold	Yes	Yes
Carbon Performance Coefficient (CPC)	0.152 – 0.185	0.70	0.52 – 0.68
Maximum Permitted CPC (MPCPC)	0.35	1.15	1.15
Carbon Pass?	Yes	Yes	Yes
Renewable Energy Ratio (RER)	0.398 – 0.424	0.13	0.14 – 0.33
Minimum RER	0.2	0.1	0.1
Renewable Energy Pass?	Yes	Yes	Yes
Preliminary BERs	A2	A2	Minimum A3

Table 1 – DEAP & NEAP Assessment Results

2. Development Description

Axiseng have been commissioned by The Land Development Agency to prepare this Climate Action Energy Statement for the Large-Scale Residential Development proposed at Galway Port in Galway City.

The Land Development Agency intends to apply to Galway City Council for permission for a 'Large-Scale Residential Development' (LRD) at a site of 1.621 Ha in Galway Port at Dock Road and Lough Atalia Road, Galway City, and extending to include parts of both roads for road infrastructure works and water services infrastructure works.

The proposed development principally consists of: the demolition of the existing office / bus depot building (370.2 sq m) and ancillary building (26 sq m); the partial demolition of the existing ESB sub-station (67.4 sq m); the demolition of existing boundary walls at the south-west and north-west; and the construction of a mixed-use development.

The proposed mixed-use development primarily comprises: 356 No. residential apartments (172 No. 1-bed, 169 No. 2-bed and 15 No. 3-bed); crèche (255.9 sq m); 2 No. café/restaurant units (totalling 428.4 sq m) and 1 No. retail unit (156.0 sq m). The development has a total floor area of 32,096.0 sq m and is primarily proposed in 4 No. blocks (identified as A–D) that generally range in height from 6 No. to 13 No. storeys.

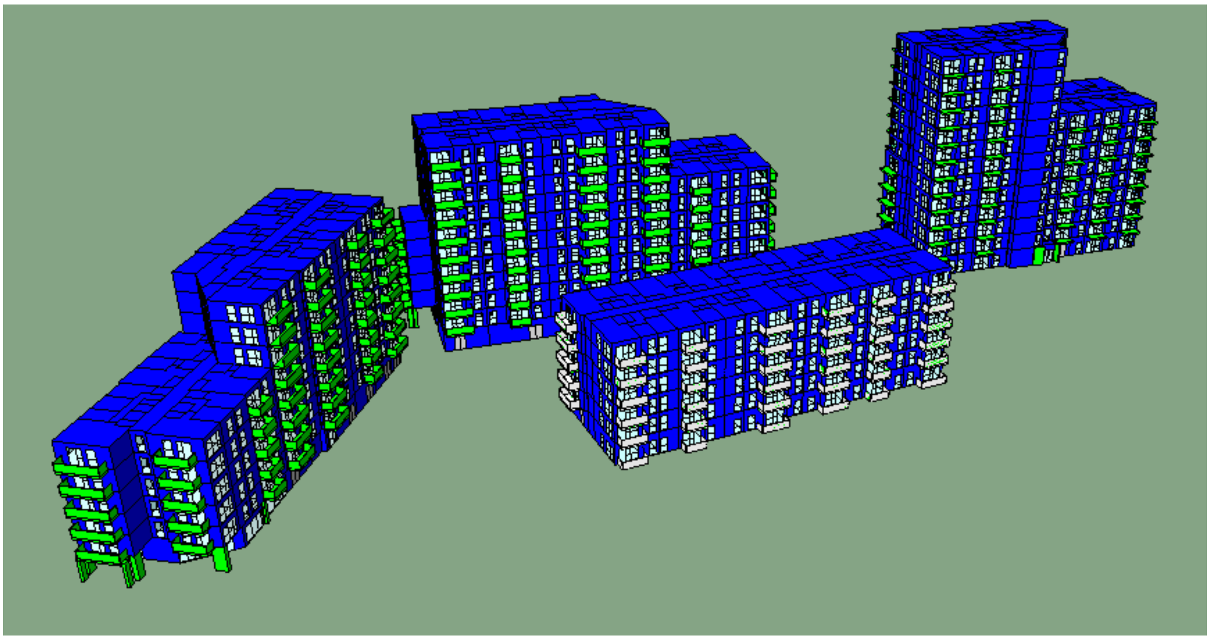
The proposed development also includes: new internal street and pedestrian network, including a one-way vehicular route at the north-western side of the site and new junctions with Dock Road at the south-west and with the access road from Lough Atalia at the north-west; upgrades to Lough Atalia Road and the access road from it at the north-west of the site, including the provision of a new toucan pedestrian/cycle crossing at Lough Atalia Road; upgrades to the footpath and road interface with Dock Road to the south-west; 37 No. car parking spaces; 1 No. set-down/delivery bay; 748 No. cycle parking spaces; hard and soft landscaping, including public open spaces and communal amenity spaces; private amenity spaces as balconies and terraces facing all directions; boundary treatments; public lighting; bin stores; plant rooms; rooftop lift overruns; rooftop telecommunications and plant infrastructure and enclosure at Block C; recladding of the existing sub-station and pumping station; and all associated works above and below ground.

3. Introduction

Axiseng have been commissioned by The Land Development Agency to undertake a part L – NZEB/BER analysis on the residential development of Galway Port LRD. The development consists of four mixed-use blocks; Blocks A – D contain residential units with commercial and amenity spaces at ground floor.

Due to the mixed-use nature of the development, there have been a number of assessments completed to ensure the proposal shall meet the requirements of Part L of the Building Regulations for both dwellings and buildings other than dwellings. These are listed below:

- Compliance with Part L of the Building Regulations for Buildings Other than Dwellings: NEAP (Non-Dwelling Energy Assessment Procedure) assessments the landlord and commercial/amenity spaces of blocks A-D.
- Compliance with Part L of the Building Regulations for Dwellings: DEAP (Dwelling Energy Assessment Procedure) assessments of a sample of 20 apartments in Blocks A-D.

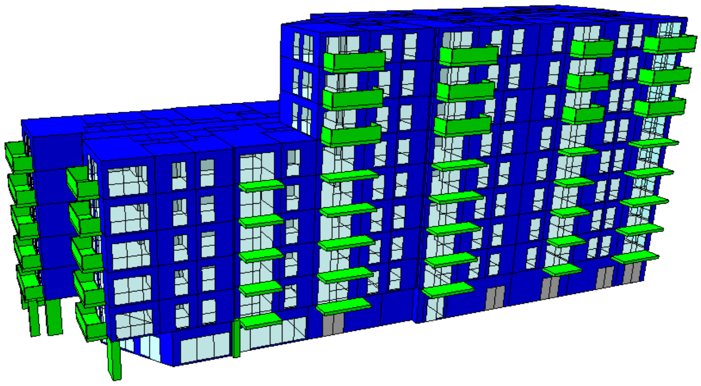


4. Geometry

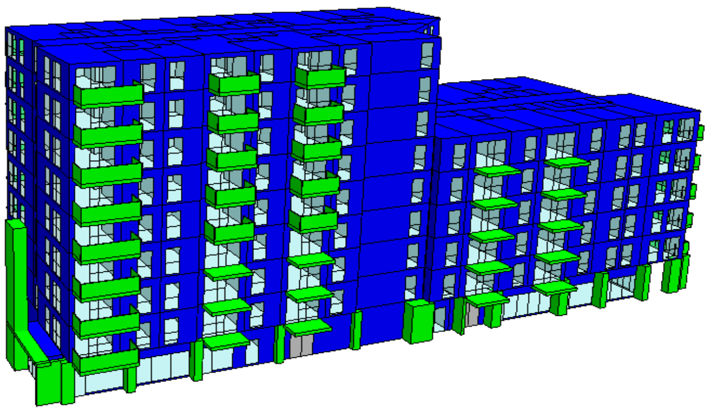
Geometry of the proposed development for each block is presented on the following pages.

4.1 Block A

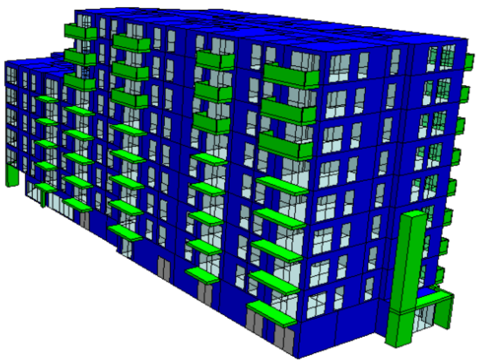
East



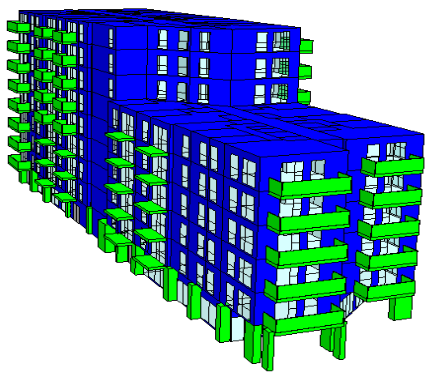
West



North

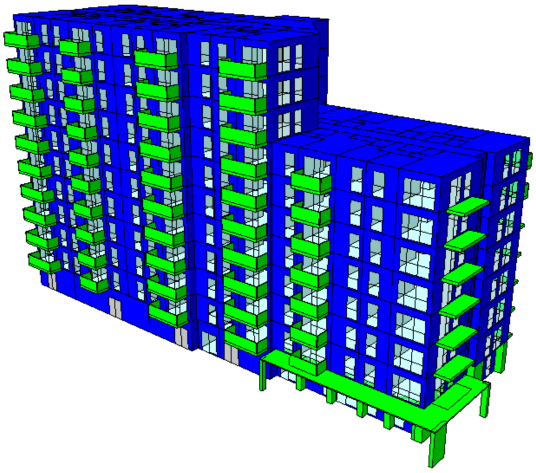


South



4.2 Block B

East



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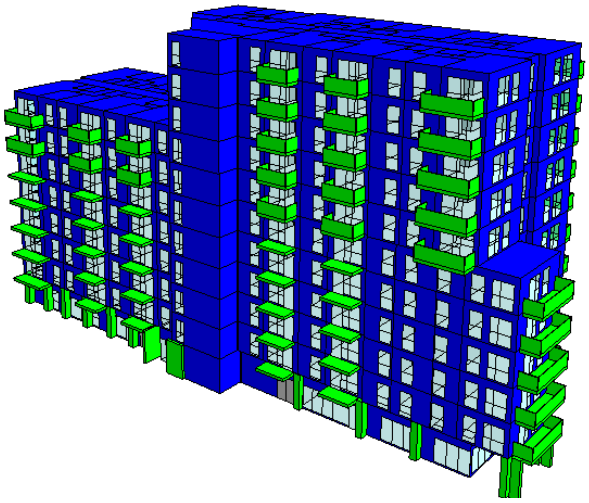
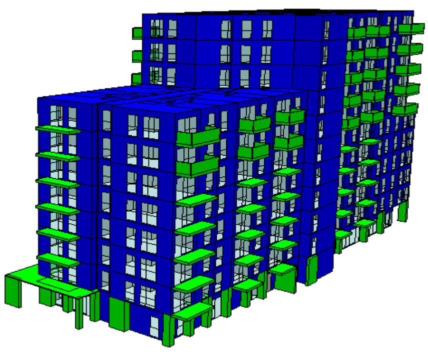
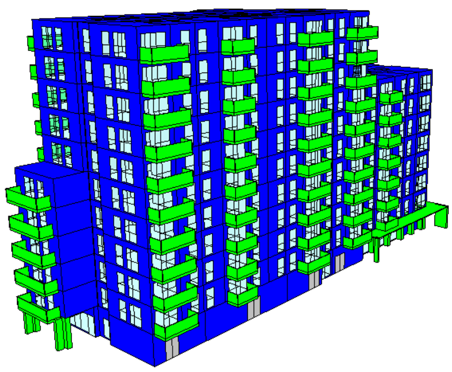


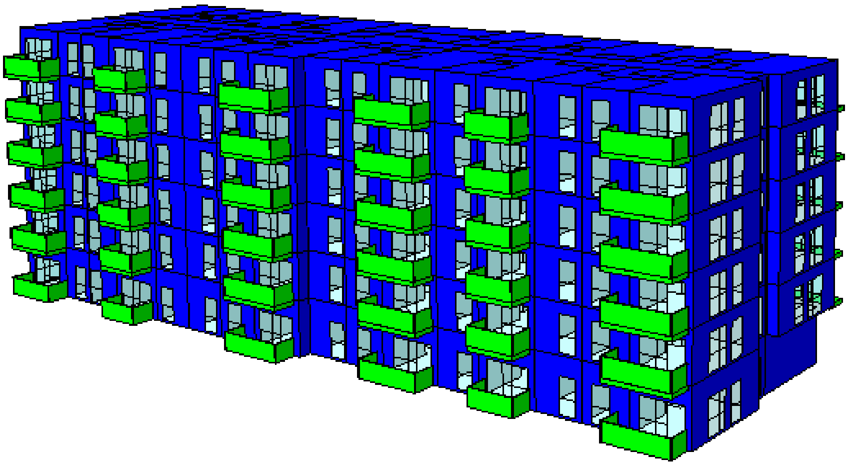
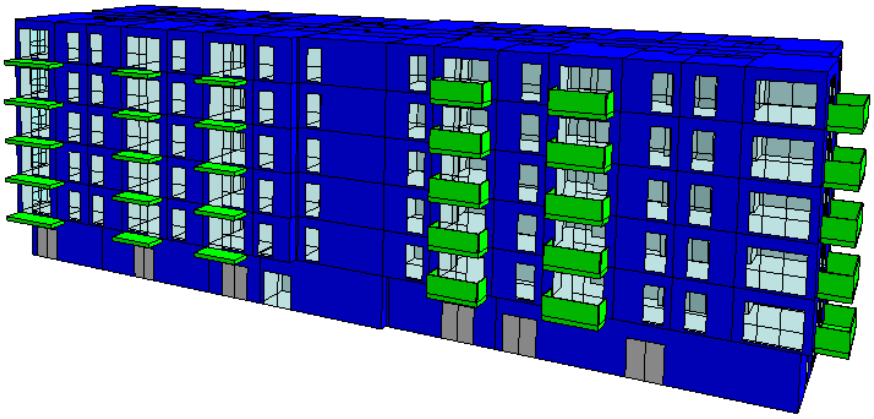
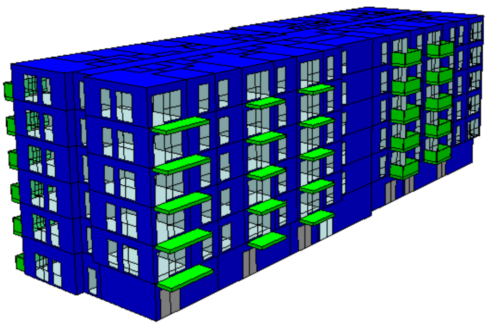
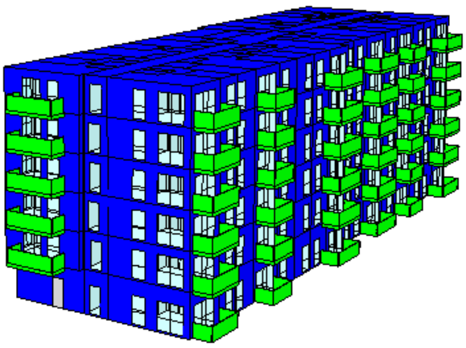
North



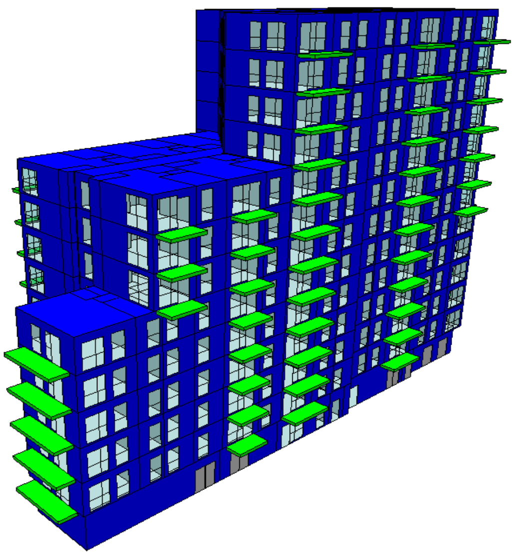
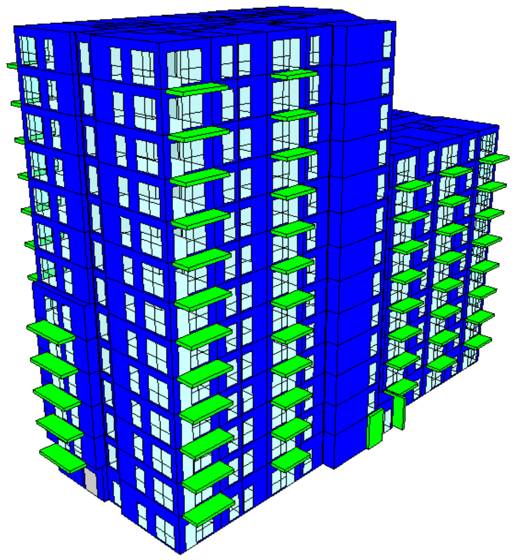
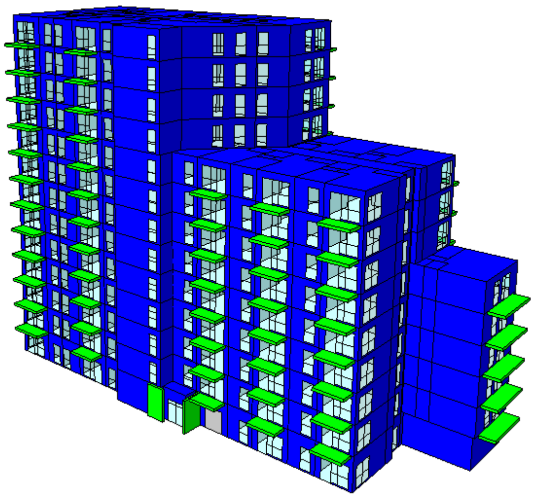
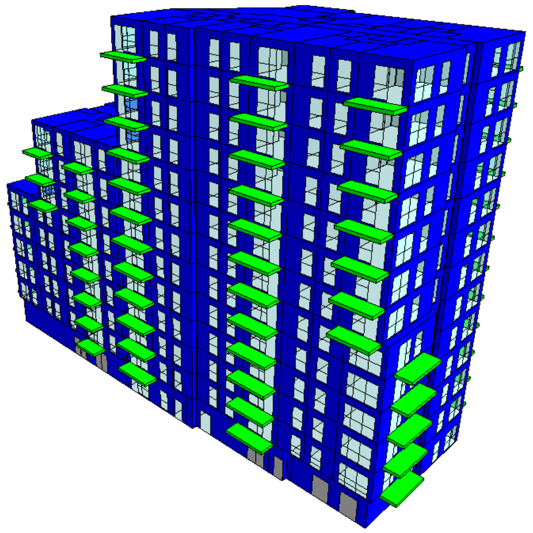
South



4.3 Block C

East	
	
West	
	
North	**South**
	

4.4 Block D

North	South
	
East	**West**
	

5. Legislative Requirements & Objectives

5.1 Policy Context

This statement is aligned with EU and national climate policy. The European Green Deal and European Climate Law commit the EU to climate-neutrality by 2050 with an intermediate target of at least 55% net GHG reduction by 2030 ("Fit for 55"). The 2023 revision of the Renewable Energy Directive raises the binding EU-wide 2030 renewables share to a minimum of 42.5% (with an ambition to reach 45%). These measures are implemented through updated instruments including the Effort Sharing Regulation and EU ETS revision. Ireland's Climate Action Plan 2025 (CAP25) operationalises the national pathway toward a 51% emissions reduction by 2030, with specific measures for the built environment (fabric upgrades, heat pumps, renewables, and smart electrification). European Commission Renewable Energy Targets

The proposed development will be designed in accordance with the following standards and regulations:

- EPBD – Energy Performance of Buildings Directive (EU/2010/31) (Including the 2024 recast (EU/2024/1275))
- Building Regulations Technical Guidance Document (TGD) - Part L 2022
- SEAI Non-Domestic Energy Assessment Procedure Guidance Document V1 (2022)
- Government of Ireland Climate Action Plan 2025
- Galway City Development Plan 2023-2029

5.1.1 Energy Performance Building Directive (EPBD)

The Energy Performance of Buildings Directive (EPBD) is the principal legislative framework governing the energy performance of buildings across the European Union. It aims to promote energy efficiency and accelerate the adoption of renewable energy sources within the building sector.

The current directive, (EU) 2024/1275, adopted on 24 April 2024, is a recast of the 2010/31/EU Directive and introduces several new measures. It reinforces the EU's commitment to enhancing the energy performance of buildings and increasing the rate of renovation across member states.

In Ireland, the EPBD has been transposed into national legislation through amendments to the Building Regulations 1997 (Part L). The proposed development will fully comply with the requirements set out in Technical Guidance Document Part L (TGD Part L). It is noted that the 2024 Directive has not yet been transposed into a newer version of TGD Part L however this is expected to take place in the coming years.

5.1.2 Building Regulations Technical Guidance Document (TGD) - Part L 2022

Technical Guidance Document (TGD) Part L has been published by the Minister for Housing, Local Government and Heritage under Article 7 of the Building Regulations 1997 (as amended).

It provides guidance on meeting the requirements of Part L of the Second Schedule to the Building Regulations, (as amended), the European Union (Energy Performance of Buildings) Regulations 2021 (S.I. No. 393 of 2021), and the European Union (District Heating) Regulations 2022 (S.I. No. 534 of 2022).

These requirements include:

- The application of a methodology for calculating the energy performance of buildings, based on the general framework set out in Annex I of the recast EPBD.
- The setting of minimum energy performance requirements for buildings, including the requirement for new buildings to achieve Nearly Zero Energy Building (NZEB) standards.
- The provision of minimum electric vehicle recharging infrastructure in new buildings and in existing buildings undergoing major renovation, where there are more than 10 car parking spaces.
- where technically and economically feasible, the buildings shall be equipped with self-regulating devices for the separate regulation of the temperature in each room or, where justified, in a designated heated zone of the building unit in accordance with the control's requirements outlined in Subsections 1.4.2 and 1.4.4 of TGD Part L.

The proposed building will fully comply with Technical Guidance Document Part L 2022 (NZEB) of the Building Regulations. This document outlines the strategies that will be implemented to ensure full compliance with all applicable requirements.

5.1.3 SEAI Non-Domestic Energy Assessment Procedure Guidance Document

The Non-Domestic Energy Assessment Procedure (NEAP) is the official methodology in Ireland used to demonstrate compliance with specific aspects of Technical Guidance Document Part L of the Building Regulations. NEAP is also used to generate the Building Energy Rating (BER) and accompanying advisory report for both new and existing non-domestic buildings.

NEAP calculates a building's energy consumption and associated CO_2 emissions based on standardised usage patterns. Energy consumption is expressed in kilowatt-hours per square metre per year (kWh/m^2. annum), while CO_2 emissions are presented as kilograms of CO_2 per square metre per year (kg CO_2/m^2. annum).

The Simplified Building Energy Model for Ireland (SBEMie) and its user interface, iSBEMie, are the tools used within NEAP to ensure consistent and reliable evaluations of energy performance in non-domestic buildings, both for compliance with Building Regulations and for BER certification purposes.

5.1.4 Government of Ireland Climate Action Plan 2025

The Government of Ireland's Climate Action Plan 2025 was launched in March 2025 and represents the fourth annual update to Ireland's original Climate Action Plan 2019. It is the most recent iteration and continues to build on the Climate Action and Low Carbon Development (Amendment) Act 2021. The plan sets out the framework for implementing carbon budgets and sectoral emissions ceilings, outlining a roadmap to halve Ireland's greenhouse gas emissions by 2030 and achieve net-zero emissions by 2050. The 2025 Plan strengthens governance through the establishment of the Building Standards Regulatory Authority. It also deepens its focus on reducing embodied carbon and promoting circular economy practices in construction, while aligning with EU directives and reinforcing the public sector's leadership role in climate action.

5.1.5 Galway City Development Plan 2023-2029

Climate Action emphasises compact growth, reduced energy demand, diversification of energy sources and climate-resilient design. The proposal supports these aims by concentrating efficient buildings on a serviced urban site, minimising operational energy and preparing for future low-carbon energy networks. consult.galwaycity.ie

As stated in Policy 2.2 of the Galway City Development Plan on Climate Action, the development must support the implementation of International, European and National objectives as detailed in the following:

- EU Climate Adaptation Strategy 2021;
- the European Green Deal;
- The Climate Action and Low Carbon Development Acts 2015 to 2021;
- The annual National Climate Action Plan and any revisions thereof;
- The National Climate Adaptation Framework 2018;
- The National Climate Change Strategy;
- EU Biodiversity Strategy for 2030;
- Sectoral Adaptation Plans and
- The National Climate Mitigation Plan (when prepared and adopted)

Table 2 outlines how the project has aligned with the relevant policies of the Galway City Development Plan.

Table 2 – Alignment with Galway City Development Plan (Chapter 2 – Climate Action)

Policy Ref.	Description	Alignment of Proposed Development
2.3 Renewable Energy	Promote small-scale, on-sit renewable energy (e.g. solar, district heating, waste heat recovery, geothermal, air-to-water).	The scheme integrates centralised air-to-water heat pumps for heating and DHW, classed as renewable technology. Apartments are served via HIU's, while commercial/landlord areas use VRF and LPHW radiators from the same renewable source. These systems exceed Part L renewable requirements and achieve EU Taxonomy alignment.
2.4 Sustainable Building Design & Construction	Increase building energy performance; limit GHG emissions; maximise renewable and low-carbon energy through siting, layout, orientation, and construction.	The design achieves A2 BER ratings apartments and A2-A3 for commercial/landlord areas. U-values exceed Part L minimums (e.g., 0.18 W/m²K external walls, 0.15 W/m²K roofs/floors). Airtightness is targeted at 3m³/hr/m²@50Pa. Whole house MVHR with 88% efficiency reduces demand. Building orientation and façade design also minimise solar gains (per CIBSE TM59 analysis).

2.5 Climate Adaptation & resilience	Ensure development is resilient to climate change, including overheating risks and flood resilience.	A full thermal comfort and overheating assessment (CIBSE TM59) was carried out, demonstrating. Overhangs and glazing were designed to mitigate solar gains. The site design also incorporates sustainable drainage and resilience measures in line with flood risk guidelines.
2.6 Reduction of Fossil Fuel Dependence	Promote transition away from fossil fuels in favour of renewables/ low-carbon alternatives.	No fossil fuels boilers are included. All heating and hot water demand is met by electric-driven renewable systems (heat pumps), ensuring a fossil-fuel-free approach
2.7 EU/National Policy Alignment	Support EU Directives, National Climate Action Plan, BER certification, and NZEB standards	The scheme achieves NZEB compliance and surpasses EU Taxonomy thresholds (10% better than NZEB). The development fully aligns with the Energy Performance of Buildings Directive and the Climate Action Plan 2023, supporting decarbonisation pathways
Core Strategy Policy 1.4 (2)	"Support a just transition to a greener, low carbon and climate resilient city and integrate climate mitigation and adaptation measures in all plans and projects"	The development supports a just transition by integrating renewable energy, minimising operational carbon, and future-proofing the design to meet climate targets. The scheme demonstrates both mitigation (via low-carbon systems and efficiency) and adaptation (via overheating and resilience measures)

5.2 Energy Options appraisal and preferred solution

As part of the energy climate action energy statement, a range of low-carbon heating and renewable generation technologies were appraised to identify a configuration that balances technical feasibility, cost-effectiveness, long-term resilience, and alignment with national and EU decarbonisation policy. The appraisal considered both individual and centralised heat pump systems, solar technologies, and future district heating readiness, alongside the exclusion of fossil fuel options due to their incompatibility with climate targets. The following summary outlines the technologies assessed, the rationale for their inclusion or exclusion, and the preferred integrated solution.

- **Individual air-source heat pumps (ASHPs)** per block vs. **centralised ASHP plant** with low-temperature distribution;
- **Ground-source heat pumps (GSHPs)** (borehole field feasibility subject to ground conditions and cost);

- On-site photovoltaics (PV) for common services and dwelling loads. Not currently required to achieve TGD Part L compliance.
- Solar thermal (screened due to lower whole-life value relative to PV + heat pump pairing);
- Connection-readiness for future district heating (no committed scheme at present, but we will deliver plantroom and hydraulic provisions to enable later connection if/when viable);
- Natural gas was discounted due to misalignment with EU and national decarbonisation policy trajectories and long-term carbon lock-in.

Preferred approach:

- Centralised ASHPs supplying low-temperature space heating and DHW via high-efficiency heat pumps to heat interface units in each apartment
- Mechanical Heat Recovery Ventilation will extract stale air from wet areas and provide tempered fresh air into occupied areas recovering heat from the extracted air
- No fossil fuels; electrical infrastructure sized for future electrification growth (e.g., EV charging and potential additional PV).
  This configuration minimises operational carbon, maintains compliance resilience as grid carbon intensity falls, and is consistent with CAP25 measures for buildings and heat.
- *Refer to Sections 6.0 & 7.0 for further specifications and detail.

The approach aligns with Ireland's Climate Action Plan 2025 for buildings prioritising fabric upgrades, electrification of heat (heat pumps), on-site renewables and smart, flexible demand-contributing to the national 51% by 2030 emissions-reduction target.

5.3 Embodied & Whole-life Carbon

The client and the design team are aware of the growing importance of tackling embodied carbon for reducing the lifecycle emissions of the project.

Unlike operational energy performance, there is no provision in the building regulations to limit the embodied or whole life carbon of buildings. However, this is poised to change with the approval of the revised Energy Performance of Buildings Directive (EU/2024/1275). Amongst other requirements, article 7 of the revised EPBD mandates member states to introduce limit values on the total cumulative life cycle GWP of all new buildings and set targets for new buildings from 2030.

5.3.1 LETI, incl. RIAI / RIBA targets

Emerging benchmarks for specific building types—such as office, residential, educational, and retail—are beginning to gain clarity, as exemplified by the Carbon Target Alignment developed by the Low Energy Transformation Initiative (2021, see table 3). This framework establishes upfront carbon targets for construction stages A1–A5 using a defined dataset for residential, office, and school buildings.

LETI benchmarks consider both Upfront Embodied Carbon (Stages A1–A5) and Whole Life Embodied Carbon (Stages A1–A5, B1–B5, C1–C4). These benchmarks are tailored to specific building types, highlighting that a favourable carbon scenario for one type (e.g., residential) may not directly align with others (e.g., industrial).

This letter banding system is aligned with the Upfront and Embodied Carbon targets set in the RIBA/RIAI 2030 Climate Challenge initiatives. Current benchmarks aligned with LETI band E; 2025 target aligned with LETI band C and 2030 target aligned with LETI band B, with values dependant on the building type.

The reference value for residential buildings under the RIAI / RIBA 2030 Climate challenge initiatives corresponds to LETI letter banding B, with upfront and embodied carbon targets of < 400 and <625 kg CO_2e/m^2 respectively.

Upfront Embodied Carbon, A1-5 (excl. sequestration)

Band	Office	Domestic / Residential (6+ storeys) *	Education	Retail
A++	<100	<100	<100	<100
A+	<225	<200	<200	<200
A	<350	<300 *	<300	<300
B	<475	<400	<400	<425
C	<600	<500	<500	<550
D	<775	<675	<625	<700
E	<950	<850	<750	<850
F	<1100	<1000	<875	<1000
G	<1300	<1200	<1100	<1200

Life Cycle Embodied Carbon, A1-5, B1-5, C1-4

A++	<150	<150	<125	<125
A+	<345	<300	<260	<250
A	<530	<450 *	<400	<380
B	<750	<625	<540	<535
C	<970	<800	<675	<690
D	<1180	<1000	<835	<870
E	<1400	<1200	<1000	<1050
F	<1625	<1400	<1175	<1250
G	<1900	<1600	<1350	<1450

** Note RIAI /RIBA considers a higher target for larger dwellings >133m2 and for all lower density development up to 2 stories aligned with LETI band A

A LETI 2030 Design Target

B RIBA 2030 Built Target

C LETI 2020 Design Target

Table 3 LETI letter banding system including RIAI/RIBA targets

5.3.2 INDICATE

While the Energy Performance of Buildings Directive (EPBD) mandates that life cycle Global Warming Potential (GWP) measurement begin in 2028, a framework for assessment and a roadmap introducing limit values must be established and published by the end of 2027. Together with Czechia and Spain, Ireland has joined the INDICATE project, which goal is to contribute to establishing these initial benchmarks in countries where such efforts are still in early stages and to share the lessons learned across Europe.

Preliminary findings for Ireland have been produced by the Irish Green Building Council. A mean embodied carbon average of 826 kg CO_2e/m^2 was found for all new buildings and samples, and 863 $kgCO_2e/m^2$ specifically for apartment buildings (note sample is only fourteen buildings), using the INDICATE project methodology, and an upfront carbon of 546 and 584 $kgCO_2e/m^2$ respectively.

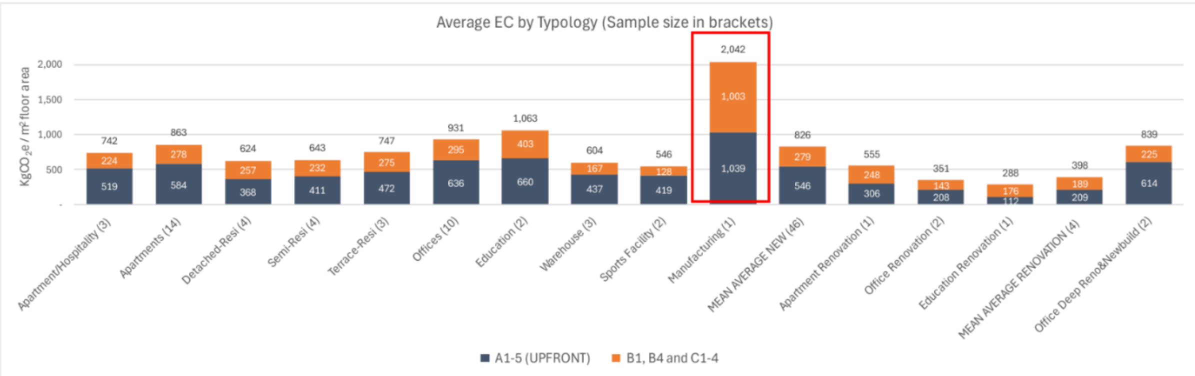


Figure 1. *Average Embodied Carbon [kg CO_2e/m^2 floor area] by typology[5]*

The below summarises the values discussed above under the LETI and INDICATE sections

Space Names (Zones)	Upfront Carbon (kgCO2e/m2, A1-A5)	Embodied Carbon (kgCO2e/m2, A-C, excl. B6-B7)
Average EC (IGBC) – all types	546	826
Average EC (IGBC) - apartments	564	863
LETI 2020 Design target	< 500	< 800
RIAI 2030 Built target	< 400	< 625
LETI 2030 Design target	< 300	< 450

Table 4. *Upfront / Embodied carbon targets summary*

Setting embodied carbon targets is inherently complex, but every effort will be made to reduce material and processes related emissions and align with current industry benchmarks. While Ireland has no statutory embodied-carbon limits at present, the design team will aim to approach the LETI 2020 design target of <800 kg CO_2e/m^2, which reflects current performance levels identified by the IGBC, while ideally working towards the more ambitious RIBA 2030 built target of 625 kg CO_2e/m^2 to demonstrate ambition and definability. For non-domestic elements, a target ≤ 750 $kgCO_2e/m^2$ (A1-A5) will be applied.

We will undertake a Whole Life Carbon (WLC) assessment in accordance with EN 15978 / EU Level(s) framework conventions across modules A1-A5, B1-B5 and C1-C4 (with biogenic accounting and refrigerants). We will report against EU Levels(s) WLC categories for transparency and benchmarking, and:

- Commit to a **Stage ¾ WLC** with an **Embodied Carbon Reduction Plan** (top 10 interventions, % savings vs. baseline).
- Engage with suppliers at and early stage for EPD's, low-carbon concrete (e.g., GGBS), and recycled steel; design-for-disassembly notes; selective use of timber where appropriate.
- Track **MEP embodied carbon** (often 15-30% of A1-A5 of resi blocks) and specify **low-GWP refrigerants.** (Benchmarks and methods consistent with RIBA/LETI and GLA guidance).

To achieve these targets, the design will prioritise **material efficiency and circularity through:**

- optimised structural grids,
- procuring concrete with high proportions of recycled binders such as GGBS and fly ash-where appropriate,
- low-carbon EAF steelwork and reinforcement with a high recycled content
- Responsibly sourced timber, locally sourced if possible
- Efficient MEP with low-GWP refrigerants
- Non–oil-based insulation products, preferably sourced through take-back schemes to minimise end-of-life impacts and support circularity

6. NEAP Assessment of TGD Part L 2022: Buildings Other than Dwellings

6.1 Commercial Compliance with TGD Part L 2022: Buildings Other than Dwellings (Blocks A and B Commercial Spaces)

Blocks A and B both have ground floor commercial spaces which will be completed to "grey box". A "grey box" is an unfinished commercial space with minimal interior services for future tenant fit-out.

To check compliance against TGD Part L is possible, notional building services systems and completed building fabric have been applied to each space and the units have all been checked for compliance and BER individually. All spaces can achieve compliance meeting the minimum requirements including the MPEPC, MPCPC and RER. The building is designed for high efficiency involving the following measures:

- Low U-values either matching or exceeding TGD L 2022 minimum elemental U-values
- Air permeability target of $3m^3/hr/m^2$ @ 50Pa in line with industry norms.
- Variable Refrigerant Flow (VRF) system serving all occupied areas with an SCOP of 3.50 and SEER of 4.50
- Local mechanical ventilation with plate heat exchanger heat recovery with an efficiency of 80%
- Low specific fan power values of 1.6 W/l/s on local MVHR
- LED lighting with an efficacy of 130Lm/W
- High Temperature heat pump for Domestic Hot Water production for each unit

The current design proposals comply with Part L of the building regulations for all commercial spaces of Blocks A & B, and which have minimum preliminary BERs of A3. Each of the commercial units must comply individually, and they shall each have a separate BER. If any elements of design deviate from notional systems shown within, results will need to be verified.

6.1.1 Fabric-first and efficient systems

The development adopts a fabric-first approach to minimise energy demand before supply is considered. Project performance targets include: thermally efficient envelopes, reduced thermal bridging, and high airtightness. Services strategies prioritise efficient ventilation with heat recovery (where appropriate), low-energy lighting and controls, and demand-led operation to limit parasitic loads. Together these measures are designed to reduce operational energy intensity and associated carbon emissions in line with EU and national decarbonisation trajectories.

6.1.2 Building Envelope

While this report advises of minimum U-values required to meet compliance, the Architect is responsible for ensuring the build-up of the elements are meeting the U-values and overall sign off on the Part L compliance strategy of the building envelope. The Architect may advise if any of the below figures are being exceeded (i.e. the achieved U-value is higher than required) and must confirm if they are being achieved.

The constructions detailed below have been created based on the proposed U-values from the Architect, which meet or exceed the targeted U-values set out in Table 1, of the Building Regulations Part L for new buildings other than dwellings;

Building Element	Targeted Part L Targeted U-value (W/m²K)
Exposed Floor (Non-Domestic)	0.15
External Wall (Non-Domestic)	0.18
Exposed Roof (Non-Domestic)	0.15
External Window	1.20 (g-value = 0.50*)
Spandrel Panel (where applicable)	1.20 (g-value = 0)
Insulated Internal Ceiling/Floor (to unheated space)	0.15
Insulated Internal Ceiling/Floor (between apartments and commercial spaces)	0.15
Uninsulated Internal Ceiling/Floor	0.94
Uninsulated Internal Partition Wall	1.03
Insulated Internal Partition Wall (to unheated space)	0.2
*Refer to Section 9 for compliance with the solar gain limitations.	

Refer to Appendices for details of where building constructions have been applied.

6.1.3 Thermal Bridging

The following default Part L thermal bridging coefficient inputs were used in the thermal model. Thermal bridging details are to be confirmed by the Project Architect;

Type of junction	Junctions involving metal cladding	QA accredited	Junctions NOT involving metal cladding	QA accredited
	Psi (W/(m·K))		Psi (W/(m·K))	
Roof-wall	0.420	☐	0.180000	☐
Wall-ground floor	1.730	☐	0.240000	☐
Wall-wall (corner)	0.380	☐	0.140000	☐
Wall-floor (not ground)	0.040	☐	0.110000	☐
Lintel above window/door	1.910	☐	0.450000	☐
Sill below window	1.910	☐	0.080000	☐
Jamb at window/door	1.910	☐	0.090000	☐

It is assumed that the accredited thermal bridging details shall be supplied to meet the thermal bridging performance. To prevent excessive heat loss and local condensation issues, it is important to ensure continuous insulation and minimise thermal bridging, especially around windows, doors, wall openings, and junctions between elements. Any thermal bridge should not create a risk of surface or interstitial condensation.

6.1.4 Infiltration

The building air permeability shall be set to 3 m³/(h.m²) @ 50 pa to exceed compliance with the Building Regulations Part L in the provision of air tightness and in line with industry norm and the Architect's design intent.

6.1.5 Lighting & Electric Power Factor

The table below details the proposals for the building on the lighting installed power and controls are included in the model.

Room	Design Illuminance (lux)	Design (Lm/W)	Control Type				
			Occupancy Controls	Parasitic Power (W/m²)	Photoelectric	Sensor Type	Parasitic Power (W/m²)
Block A: Café 1	150	130	None	-	-	-	-
Block A: Café 2	150	130	None	-	-	-	-
Block A: Café Bin Store	200	110	None	-	-	-	-
Block A: Café Plant	200	110	None	-	-	-	-
Block B: Creche	280	130	None	-	-	-	-
Block B: Retail Unit	600	130	None	-	-	-	-

Table 5 – Proposed Lighting

The electric power factor for the building is modelled as > 0.95.

Metering on the lighting has been included throughout.

6.1.6 Heating, Ventilation and Air Conditioning (HVAC)

The notionally proposed HVAC systems are selected based upon their performance in providing heating, ventilation, and hot water generation at optimal efficiencies.

All of the proposed occupied spaces shall be served by a VRF system and installed with a mechanically ventilated heat recovery unit controlled locally.

Domestic Hot Water (DHW) shall be generated by a standalone high temperature air to water heat pump connected to storage within each space. Each space will have a dedicated DHW storage cylinder.

The below table contains a list of the proposed HVAC system design identified in room types within the proposed commercial spaces. Details of each system can be found in the following tables.

Room Type	HVAC System	Ventilation Type	Heat Recovery Unit	Specific Fan Power (W/L/s)
Café, Creche, Retail	VRF	Localised Heat Recovery Mech Vent	80% Plate Heat Exchanger	1.6
Plant Rooms/Bin Stores	None	Wall Louvres	-	-

6.1.6.1 VRF System – All Spaces

VRF System NEAP Model Inputs			
System Type: Split or Multi Split Units	Model Input Data:	Units:	Evidence Required:
Heating Source	Air Source Heat Pump (Electric)	-	-
Fuel Type	Electricity	-	-
SBEMie SCOP	3.5	kW/kW	EN 14825
Cooling Source	Air Source Heat Pump (Electric)	-	-
SBEMie EER/SEER	4.5 / 4.5	kW/kW	EN 14825
Provision for sub metering	Yes	-	-
Provision for "out of Range" / M&T System	No	-	-
Has ductwork been leakage tested?	No, use default		
Does the AHU meet CEN leakage standards?	No, use default		

6.1.6.2 Domestic Hot Water

Domestic hot water will be provided via standalone air to water heat pump connected to storage in each space in line with details below.

Domestic Hot Water System NEAP Model Inputs			
System Type: Air Sourced Heat Pump	Model Input data	Units	Evidence Required
Fuel Type	Electricity	-	-
Water Heating Efficiency	3.32	kW/kW	EN 16147
DHW Storage Volume*	200	Litres	EN 16147
DHW Storage Insulation Type	Factory Insulated 100mm	-	-
Is there a Secondary Circuit?	Yes		-
Circulation Losses*	15	W/m	-
Loop Length*	42.9 - 82.1	metres	-
Pump Power*	0.2	kW	-
Is there a time switch?	Yes		-
* It is noted that in the absence of data, the inputs for loop lengths, circulation losses and pump power have been assumed in the analysis. Loop Length = 4 x $\sqrt{(total\ floor\ area\ of\ space)}$ for each space. Each space has 200L of DHW storage volume assigned.			

6.1.6.3 Controls & Metering

The following control types have been applied to all HVAC systems;

Metering Provisions	Plant Controls	Plant Controls DHW
Is HVAC Metered – Yes HVAC Metering "Out of range" Alarm- No	Central Time Control – Yes Optimum Start / Stop Control – Yes Local Time Control – No Local Temperature Control – Yes Weather Compensation– Yes	Central Time Control – Yes Optimum Start / Stop Control – Yes Local Time Control – No Local Temperature Control – No Weather Compensation– Yes

6.1.7 Renewables

Renewable technologies have been employed to offset and exceed the requirements of Building Regulations Part L. The heating and cooling in the building shall generally be met by a VRF system with a designed SCOP over 350 % and SEER over 450%, which is a form of renewable energy technology in this case. Domestic Hot Water is also met by a heat pump system, therefore, is identified as renewable energy technology as well. These measures exceed the requirement for 20% of primary energy to be provided from renewable energy sources in line with Part L 2022.

The compliance with regulations is based on notional systems and will be required to be revised as design progresses prior to final completion.

6.1.8 Results

The NZEB/Part L Report & BER results for the commercial spaces in blocks A and B show that these spaces are compliant with the below Part L requirements with a minimum preliminary BER of A3. Full results provided in the table below.

- The Energy Performance Coefficient (EPC) is less than the Maximum Permitted EPC (MPEPC) of 1.0.
- The Carbon Performance Coefficient (CPC) is less than the Maximum Permitted CPC (MPCP) of 1.15.
- The Renewable Energy Ratio should be greater than 10% if the EPC is less than 0.9 or 20% if the EPC is between 0.9 and 1.0.

It is to be noted that as the design of the proposed development progresses and may change, it is worthwhile reviewing the input specification performance including any potentially upgraded U-values and HVAC systems to ensure compliance.

Commercial Part L Compliance (Blocks A and B)				
Compliance	Block A: Café 1 + Plant	Block A: Café 2 + Bins + Plant	Block B: Retail Unit	Block B: Creche
Primary Energy (Actual) kWh/m^2.yr	175.91	151.26	111.9	33.2
Energy Performance Coefficient (EPC)	0.63	0.61	0.73	0.66
Maximum Permitted EPC (MPEPC)	1.00	1.00	1.00	1.00
Primary Energy Pass?	Yes	Yes	Yes	Yes
Carbon Performance Coefficient (CPC)	0.54	0.52	0.68	0.57
Maximum Permitted CPC (MPCPC)	1.15	1.15	1.15	1.15
CO_2 Pass?	Yes	Yes	Yes	Yes
Renewable Energy Ratio (RER)	0.33	0.33	0.14	0.29
Minimum RER	0.10	0.10	0.10	0.10
Renewable Energy Pass?	Yes	Yes	Yes	Yes
Minimum Preliminary BER	A3	A3	A3	A3

6.2 Compliance with TGD Part L 2022: Buildings Other than Dwellings (Blocks A, B, C, D Landlord)

Current results from the Part L analysis show landlord areas of Blocks A, B, C and D complying with all three minimum criteria including the EPC, MCPC and RER. The building is designed for high energy efficiency involving the following measures:

- Low U-values either matching or exceeding TGD L 2022 minimum elemental U-values
- Air permeability target of $3m^3/hr/m^2$ @ 50Pa
- Corridors, Stairwells, and heated storerooms heated via LPHW radiators served by air to water Heat pumps with an SCOP of 2.65
- Natural ventilation in all corridors via corridor door hold open devices and external AOVs
- LED lighting with an efficacy of 110 Lm/W in all landlord spaces.
- High-efficiency instantaneous electric DHW where appropriate in landlord spaces

The current proposed design complies with Part L of the building regulations for the landlord areas of the building which has a preliminary BER of A2.

6.2.1 Fabric-first and efficient systems

The development adopts a fabric-first approach to minimise energy demand before supply is considered. Project performance targets include: thermally efficient envelopes, reduced thermal bridging, and high airtightness. Services strategies prioritise efficient ventilation with heat recovery (where appropriate), low-energy lighting and controls, and demand-led operation to limit parasitic loads. Together these measures are designed to reduce operational energy intensity and associated carbon emissions in line with EU and national decarbonisation trajectories.

6.2.2 Building Envelope

While this report advises of minimum U-values required to meet compliance, the Architect is responsible for ensuring the build-up of the elements are meeting the U-values and overall sign off on the Part L compliance strategy of the building envelope. The Architect may advise if any of the below figures are being exceeded (i.e. the achieved U-value is higher than required) and must confirm if they are being achieved.

The table below details constructions that have been created based on the proposed U-values which meet the targeted U-values set out in Part L. U-values are based on, and meet, or exceed, targeted values in Table 1, of the Building Regulations Part L for new dwellings and non-dwellings.

Building Element	Targeted Part L Targeted U-value (W/m^2K)
Exposed Floor	0.15
External Wall	0.18
Exposed Roof	0.15
External Window	1.20 (g-value = 0.50*)
Spandrel Panel (where applicable)	1.20 (g-value = 0)
Insulated Internal Ceiling/Floor (to unheated space)	0.15

Insulated Internal Ceiling/Floor (between apartments and commercial spaces)	0.15
Uninsulated Internal Ceiling/Floor	0.94
Uninsulated Internal Partition Wall	1.03
Insulated Internal Partition Wall (to unheated space)	0.2
*Refer to Section 9 for compliance with the solar gain limitations.	

Refer to Appendices for details of where building constructions have been applied.

6.2.3 Thermal Bridging

The following default Part L thermal bridging coefficient inputs were used in the thermal model. Thermal bridging details are to be confirmed by the Project Architect;

Type of junction	Junctions involving metal cladding	QA accredited	Junctions NOT involving metal cladding	QA accredited
	Psi (W/(m·K))		Psi (W/(m·K))	
Roof-wall	0.420	☐	0.180000	☐
Wall-ground floor	1.730	☐	0.240000	☐
Wall-wall (corner)	0.380	☐	0.140000	☐
Wall-floor (not ground)	0.040	☐	0.110000	☐
Lintel above window/door	1.910	☐	0.450000	☐
Sill below window	1.910	☐	0.080000	☐
Jamb at window/door	1.910	☐	0.090000	☐

It is assumed that the accredited thermal bridging details shall be supplied to meet the thermal bridging performance. To prevent excessive heat loss and local condensation issues, it is important to ensure continuous insulation and minimise thermal bridging, especially around windows, doors, wall openings, and junctions between elements. Any thermal bridge should not create a risk of surface or interstitial condensation.

6.2.4 Infiltration

The building air permeability shall be set to 3 $m^3/(h.m^2)$ @ 50 pa to exceed compliance with the Building Regulations Part L in the provision of air tightness and in line with industry norms and the Architect's design intent.

6.2.5 Lighting & Electric Power Factor Correction

The table below contains details on the lighting installed power and controls included in the model.

Room	Design Illuminance (lux)	Design (Lm/W)	Control Type				
			Occupancy Controls	Parasitic Power (W/m^2)	Photoelectric	Sensor Type	Parasitic Power (W/m^2)
Corridors, Stairs	100	110	MAN-ON-AUTO-OFF	0.10	-	-	-
Cleaner Store, Parcel Stores	150	110	MAN-ON-AUTO-OFF	0.10	-	-	-
Bike Store, Bin Stores	150	110	MAN-ON-AUTO-OFF	0.10	-	-	-
Plant	200	110	MAN-ON-AUTO-OFF	0.10	-	-	-

As detailed above, rooms are to be fitted with presence detection automatic sensors to switch off the lighting when the rooms are unoccupied.

The electric power factor for the building is modelled as > 0.95

6.2.6 Heating, Ventilation and Air Conditioning (HVAC)

The proposed HVAC systems are selected based upon their performance in providing heating, ventilation, and hot water generation at optimal efficiencies.

Corridors, Stairs and Heated Storage shall be heated by radiators, served by the centralised air to water heat pumps and will avail of natural ventilation.

Plant Space, Waste Storage, and Bike Storage shall be unheated and will avail of room air circulation. Smoke extract requirements are not included in Part L compliance modelling.

Domestic Hot water shall be generated via instantaneous water heater, where required.

The table below contains a list of the proposed HVAC system design identified in room types within the proposed commercial spaces. Details on mechanical systems is in the following tables.

Room Type	HVAC System	Ventilation Type	Heat Recovery Unit	Specific Fan Power (W/L/s)
Corridors, Stairs, Storage	LPHW Radiators	Natural Ventilation	-	-
Plant Spaces, Waste Storage, Bike Storage	Unheated	Room Air Circulation	-	-

6.2.6.1 Radiators – Corridors, Stairs, Storage

Radiator System NEAP Model Inputs			
System Type: Central Heating Using Radiators	Model Input Data:	Units	Evidence Required:
Heating Source	Air Source Heat Pump (Electric)	-	-
Fuel Type	Electricity	-	-
SBEMie SCOP	2.65	kW/kW	EN 14825
Provision for sub metering	Yes	-	-
Provision for "out of Range" / M&T System	No	-	-
Has ductwork been leakage tested?	No, use default		
Does the AHU meet CEN leakage standards?	No, use default		

6.2.6.2 Domestic Hot Water

Domestic Hot Water will be provided via instantaneous under sink water heaters to other spaces, where needed, in line with details below.

Domestic Hot Water System NEAP Model Inputs			
System Type: Instantaneous Hot Water	Model Input data	Units	Evidence Required
Fuel Type	Electricity	-	-
Water Heating Efficiency	1.0	kW/kW	-
DHW Storage Volume	-	Litres	-
DHW Storage Insulation Type	-	-	-
Is there a Secondary Circuit?	No		-

6.2.6.3 Controls & Metering

The following control types have been applied to all HVAC systems;

Metering Provisions	Plant Controls	Plant Controls DHW
Is HVAC Metered – Yes HVAC Metering "Out of range" Alarm- No	Central Time Control – Yes Optimum Start / Stop Control – Yes Local Time Control – No Local Temperature Control – Yes Weather Compensation– Yes	Central Time Control – Yes Optimum Start / Stop Control – Yes Local Time Control – No Local Temperature Control – No Weather Compensation– Yes

Central BMS will be designed to check metering to monitor & optimise energy usage. The energy management system is expected to review and adjust the operating efficiencies and strategy for the various building services to minimise overall energy use carbon emissions thus saving the cost.

6.2.7 Renewables

Renewable technologies have been employed to offset and exceed the requirements of Building Regulations Part L. Corridors, Stairs, and Storage shall be heated by radiators served by air-to-water heat pump, this is a form of renewable technology in this case. This measure exceeds the requirements for renewables in line with Part L 2022.

6.2.8 Results

6.2.8.1 BRIRL Document

Output from Building Regulation Ireland (BRIRL) Document for the Landlord spaces.

BRIRL Output Document

Compliance Assessment with the Building Regulations (Ireland) TGD-Part L 2017

This report demonstrates compliance with specific aspects of Part L of the Building Regulations. Compliance with all aspects of Part L is a legal requirement. Demonstration of how compliance with every aspect is achieved may be sought from the Building Control Authority.

LDA Galway Landlord

Date: Wed Jul 23 14:25:34 2025

Administrative information

Building Details

Address: LDA Galway Landlord, Address 2, Address 3, Address 4, Co. Galway, Eircode

NEAP

Calculation engine: SBEMIE

Calculation engine version: v5.6.a.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: 7.0.27

BRIRL compliance check version: v5.6.a.0

Client Details

Name: Name

Telephone number: Phone

Address: Street Address, Co. Dublin, Eircode

Energy Assessor Details

Name: Name

Telephone number: Phone

Email: you@yourISP

Address: Street Address, Co. Dublin, Eircode

Primary Energy Consumption, CO2 Emissions, and Renewable Energy Ratio

The compliance criteria in the TGD-L have been met.

Calculated CO2 emission rate from Reference building	3.6 kgCO2/m2.annum
Calculated CO2 emission rate from Actual building	2.5 kgCO2/m2.annum
Carbon Performance Coefficient (CPC)	0.7
Maximum Permitted Carbon Performance Coefficient (MPCPC)	**1.15**
Calculated primary energy consumption rate from Reference building	24.8 kWh/m2.annum
Calculated primary energy consumption rate from Actual building	19.6 kWh/m2.annum
Energy Performance Coefficient (EPC)	0.79
Maximum Permitted Energy Performance Coefficient (MPEPC)	**1**
Renewable Energy Ratio (RER)	0.13
Minimum Renewable Energy Ratio	**0.1**

Heat Transmission through Building Fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Limit}$	$U_{i\text{-}Calc}$	**Surface with maximum U-value***
Walls**	0.21	0.19	0.6	0.2	BD000282_W2_A6
Floors (ground and exposed)	0.21	0.15	0.6	0.2	BD000006_F_A1
Pitched roofs	0.16	-	0.3	-	"No heat loss pitched roofs"
Flat roofs	0.2	0.15	0.3	0.15	BD0001BB_C
Windows, roof windows, and rooflights	1.6	1.2	3	1.2	BD000000_W3_O0
Personnel doors	1.6	-	3	-	"No ext. personnel doors"
Vehicle access & similar large doors	1.5	-	3	-	"No ext. vehicle access doors"
High usage entrance doors	3	-	3	-	"No ext. high usage entrance doors"

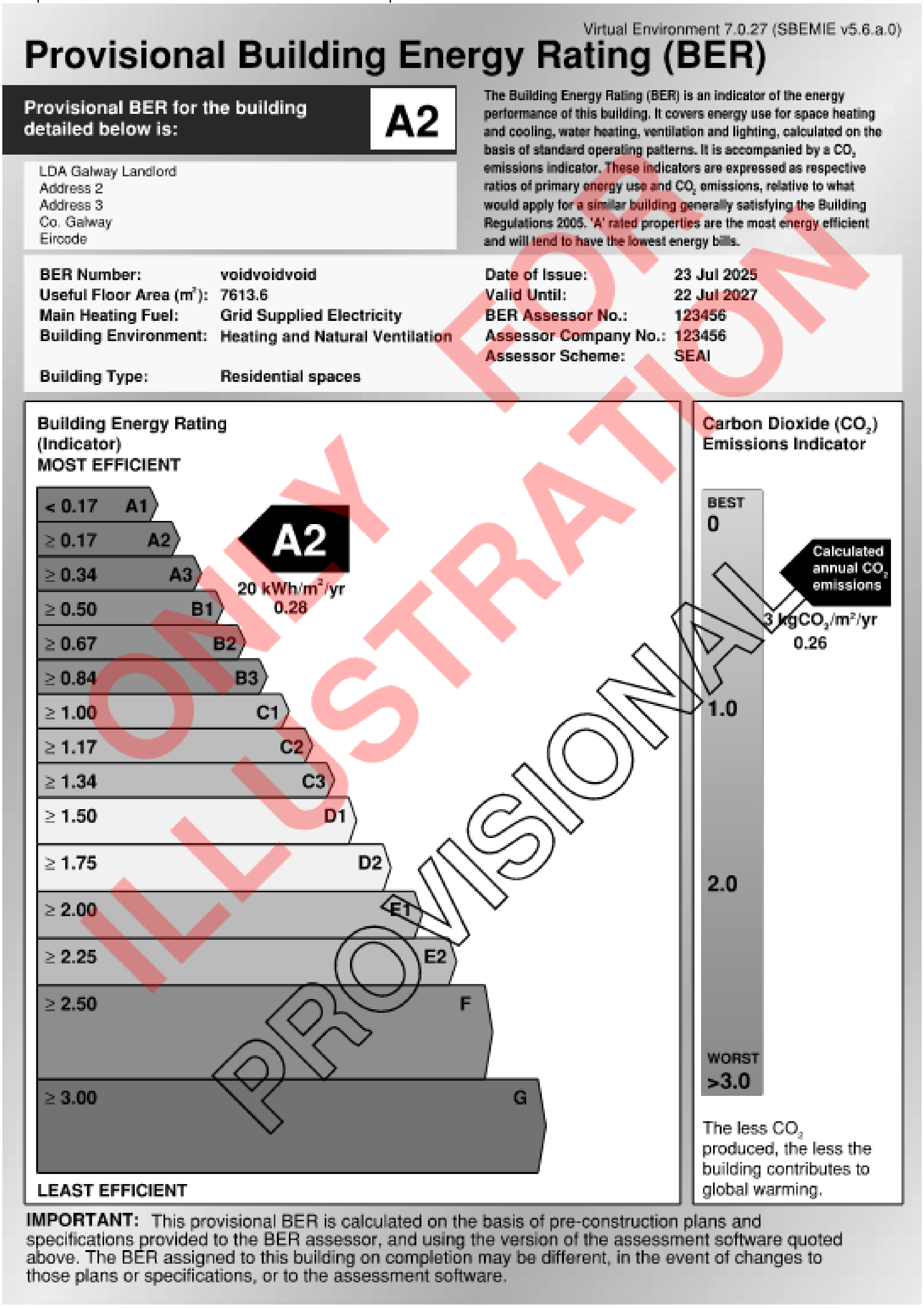
$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m2K)]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m2K)]
$U_{i\text{-}Limit}$ = Limiting individual element U-values [W/(m2K)]
$U_{i\text{-}Calc}$ = Calculated individual element U-values [W/(m2K)]

* There might be more than one surface with the maximum U-value. ** Automatic U-value check by the tool does not apply to curtain walls whose area-weighted average and individual limiting standards are 1.8 and 3 W/m2K, respectively.

Air Permeability	**Upper Limit**	**This Building's Value**
m3/(h.m2) at 50 Pa	5	3

6.2.8.2 BER Document

Output BER Document for the Landlord spaces.



Virtual Environment 7.0.27 (SBEMIE v5.6.a.0)

Provisional Building Energy Rating (BER)

Provisional BER for the building detailed below is: **A2**

LDA Galway Landlord
Address 2
Address 3
Co. Galway
Eircode

The Building Energy Rating (BER) is an indicator of the energy performance of this building. It covers energy use for space heating and cooling, water heating, ventilation and lighting, calculated on the basis of standard operating patterns. It is accompanied by a CO_2 emissions indicator. These indicators are expressed as respective ratios of primary energy use and CO_2 emissions, relative to what would apply for a similar building generally satisfying the Building Regulations 2005. 'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.

BER Number:	voidvoidvoid	Date of Issue:	23 Jul 2025
Useful Floor Area (m^2):	7613.6	Valid Until:	22 Jul 2027
Main Heating Fuel:	Grid Supplied Electricity	BER Assessor No.:	123456
Building Environment:	Heating and Natural Ventilation	Assessor Company No.:	123456
		Assessor Scheme:	SEAI
Building Type:	Residential spaces		

IMPORTANT: This provisional BER is calculated on the basis of pre-construction plans and specifications provided to the BER assessor, and using the version of the assessment software quoted above. The BER assigned to this building on completion may be different, in the event of changes to those plans or specifications, or to the assessment software.

7. DEAP Assessment of TGD Part L 2022: Dwellings

7.1 Residential Compliance with TGD Part L 2022: Dwellings (Block A-D Apartments)

Current results from the Part L analysis show the sample apartments complying with all three minimum criteria including the EPC, MCPC and RER. The apartments are designed for high energy efficiency involving the following measures:

- Low U-values either matching or exceeding Technical Guidance Document L 2022 Conservation of Fuel and Energy – Dwellings, minimum elemental U-values
- Thermal bridging to comply with the default requirements as per Part L 2022 (0.15W/m^{2}K).
- Air permeability target of 3m^3/hr/m^2 @ 50Pa
- Centralised Heat Pumps providing heating and hot water to apartments via Heat Interface Units.
- Mechanical whole house ventilation with heat recovery to each apartment.
- Low specific fan power values of between 0.5 W/l/s to 1.31 W/l/s
- LED lamps in all areas

The current design of the apartments complies with Part L of the building regulations with preliminary BERs of A2 for the sample calculated set. If any elements of design deviate from that shown within, results will need to be verified. Nearly all of the sample apartments meet the requirements for EU Taxonomy, with one of the sample, top floor apartments not meeting the minimum requirements. When a whole development energy use is considered, this will be more than 10% improvement on the NZEB energy benchmark and will therefore meet the EU Taxonomy requirements. We would also expect the default thermal bridging coefficient to be improved upon in detailed design, particularly for top and bottom floor apartments.

7.1.1 Building Envelope

While this report advises of minimum U-values required to meet compliance, the Architect is responsible for ensuring the build-up of the elements are meeting the U-values and overall sign off on the Part L compliance strategy of the building envelope. The Architect may advise if any of the below figures are being exceeded (i.e. the achieved U-value is higher than required) and must confirm if they are being achieved.

The table below details the constructions that have been created based on the proposed U-values from the Architect which exceed the targeted U-values set out in Table 1, of the Building Regulations Part L for new dwellings;

Building Elements	Proposed Elemental U-value (W/m^{2}K)
External Wall	0.18
Flat Roof	0.15
Exposed/Ground Floor	0.15
External Glazing	1.20 (g-value = 0.5, Frame Factor = 0.7)
Door	1.20
Insulated Internal Partition Wall (to unheated space)	0.20
Insulated Internal Ceiling/Floor (between apartments and commercial spaces)	0.15
Insulated Internal Ceiling/Floor (between apartments and commercial spaces)	0.15

Refer to Appendices for details of where building constructions have been applied.

Thermal bridging (y) factor has been included in the DEAP Assessments as ‘Default’ (=0.15), which may be improved upon for some apartments. Thermal mass has been assumed to be ‘medium’.

7.1.2 Lighting

The table below details proposals for the apartments on the lighting installed efficiency included in the DEAP assessments.

Room	Bulb Type	Efficiency lm/W
Apartments	LED/CFL	66.9 (Default)

7.1.3 DEAP Inputs – Heat Pump

The proposed HVAC systems are selected based upon their performance in providing heating, ventilation, and hot water generation at optimal efficiencies. The following tables provide details input into the DEAP software for heating, ventilation and hot water generation for the apartments. If proposed units change, these will need to be revised to ensure compliance.

For the centralised heat pump system, the heat pumps did not have EN16147 test data. Calculations from the suppliers on the COP for space heating and hot water have been clarified and confirmed by the SEAI to use directly in the DEAP software, avoiding the need for the Heat Pump Calculator to be used. Refer to Appendices for details on calculations and heat pumps.

Tables below provide details on the heating DEAP inputs, details on the DHW inputs in DEAP and details on ventilation inputs in the DEAP software.

Heating DEAP Inputs		
Heating System		
Heating System Category	Group or District heating system	
Heating System	Group heat source	
Heating System Controls	Programmer & Room Thermostat	
Heat Pump Inputs (from Manufacturer Calculated Data confirmed by SEAI)		
Heat Pump Type	Air to Water	
Describe the Water Heating Heat Pump Arrangement	Same Heat Pump providing Space Heating and Domestic Hot Water	
Type of DHW Storage	Plate heat exchanger in a group heating system	
Storage Volume	2	litres
Is there a Water Heater installed as Back up for the Heat Pump	No	
Seasonal Space Heating Efficiency (& standard)	265%	EN 14825
Water Heating Efficiency (& standard)	294%	EN 16147*
WTOL	75	°C
TOL	-10	°C
Temperature Control	Variable Outlet	
Design Flow Temp	55	°C
Daily operation	24	Hours
Heat Pump heats hot water	Yes	
Heat Pump Type of DHW	Same Heat Pump as Space Heating	

Pumps & Fans		
Central Heating Pump Quantity	0	
Oil Boiler Pump Quantity	0	
Gas Boiler Flue Fan Quantity	0	
Primary System		
Distribution Loss Factor	1.05	
Is Charging Based on Heat Consumed?	Yes	

*in lieu of the EN16147 test data being provided, SEAI have reviewed calculations from the Manufacturers and confirmed the water heating efficiency

Water Heating DEAP Inputs		
Options and Storage		
Storage losses included	Yes	
Storage Type	Plate Heat Exchanger in Group Heating Scheme	
Storage Volume	2	litres
Storage indoors or in group heating scheme	Yes	
Manufacturers declared heat loss available	No	
Distribution Losses	Yes	
Primary Circuit Loss Type	Community/Group/District Heating	
Insulation Type	Factory Fitted 20mm	
Supplementary Electric Water Heating Used in Summer	No	
Low water usage	Yes	(less than 125 l/p/day)
Showers and Baths		
Quantity and Type (based on apartment type)	1No. bath 1No. shower	
Mixer system (shower)	Unvented hot water system	
Flow restrictor (shower)	Yes	
Flow rate (shower)	6 (default)	l/min
Waste Water heat recovery efficiency	N/A	
Waste water heat recovery utilisation factor	N/A	

Ventilation DEAP Inputs		
Infiltration due to Openings		
Is there a draft lobby on the main entrance?	Yes	GF apartments all access from main corridor
Ventilation items – chimney or flue	No	
Ventilation items – Intermittent Fan	Yes	Kitchen
Passive Non-closable Vent	No	
Structural Air Tightness		
Air tightness	0.15	ac/h
Number of sides sheltered	Varies from 1 to 4 depending on apartment and location etc	
Ventilation Method		
Ventilation Method	Balanced Whole-House Mechanical Ventilation with Heat Recovery	
Specific Fan Power	0.62	W/l/s
Heat Exchanger Efficiency	88	%
Manufacturer	Zehnder	
Model	ComfoAir	
How many wet rooms?	K+2	
External uninsulated ductwork?	No	

7.2 Renewables

Renewable technologies have been employed to offset and exceed the requirements of Building Regulations Part L. The heating and Domestic Hot Water in all apartments is met by a heat pump system, therefore, is identified as renewable energy technology. These measures exceed the requirements for renewables in line with Part L 2022.

7.3 Results

The DEAP NZEB/Part L & BER results for the Galway Port development show that the sample apartments shall be compliant with the Part L requirements and with preliminary BERs of A2.

- The Energy Performance Coefficient (EPC) is less than the Maximum Permitted EPC (MPEPC) of 0.3.
- The Carbon Performance Coefficient (CPC) is less than the Maximum Permitted CPC (MPCP) of 0.35.
- The Renewable Energy Ratio (RER) of 0.20 or greater should be achieved which represents 20% of the primary energy from renewable energy technologies.

The Dwelling Energy Assessment Procedure (DEAP) analysis tool has been used to complete this assessment and inputs relating specifically to this tool are provided in the previous sections of this report with results in the following tables. It is to be noted that as the design of the proposed development progresses and may change, it is worthwhile reviewing the input specification performance including any potentially upgraded U-values, sanitaryware proposals and HVAC systems to ensure compliance. The below 4 tables provide DEAP Assessment results for sample apartments in Blocks A-D respectively.

Whilst there may be one or two of the sample apartments not fully meeting the requirements for EU Taxonomy on its own, these are top floor apartments with increased heat losses. When the total is taken of all the primary energy required for the sample apartments, this is less than 10% of the energy benchmark for NZEB for the sample apartments, which is the requirement for EU Taxonomy. Initial calculations for planning have been completed with the default thermal bridging (y) factor (0.15), which may be improved upon during detailed design when the Architect's design has been completed.

Compliance	Block A Results
Primary Energy (Actual) kWh/m^2.yr	31.24 – 43.87
Energy Performance Coefficient (EPC)	0.233 – 0.256
Maximum Permitted EPC (MPEPC)	0.3
Primary Energy Pass?	Yes
EU Taxonomy Maximum Permitted EPC (MPEPC)	0.27
Primary Energy EU Taxonomy Pass?	Yes
Carbon Performance Coefficient (CPC)	0.158 – 0.169
Maximum Permitted CPC (MPCPC)	0.35
Carbon Pass?	Yes
Renewable Energy Ratio (RER)	0.401 – 0.421
Minimum RER	0.2
Renewable Energy Pass?	Yes
Preliminary BER	A2
Compliance	Block B Results
Primary Energy (Actual) kWh/m^2.yr	28.67 – 42.34

Energy Performance Coefficient (EPC)	0.233 – 0.265
Maximum Permitted EPC (MPEPC)	0.3
Primary Energy Pass?	Yes
EU Taxonomy Maximum Permitted EPC (MPEPC)	0.27
Primary Energy EU Taxonomy Pass?	Yes
Carbon Performance Coefficient (CPC)	0.158 – 0.173
Maximum Permitted CPC (MPCPC)	0.35
Carbon Pass?	Yes
Renewable Energy Ratio (RER)	0.398 – 0.419
Minimum RER	0.2
Renewable Energy Pass?	Yes
Preliminary BER	A2

Compliance	Block C
	Results
Primary Energy (Actual) kWh/m^2.yr	34.36 – 43.18
Energy Performance Coefficient (EPC)	0.223 – 0.264
Maximum Permitted EPC (MPEPC)	0.3
Primary Energy Pass?	Yes
EU Taxonomy Maximum Permitted EPC (MPEPC)	0.27
Primary Energy EU Taxonomy Pass?	Yes
Carbon Performance Coefficient (CPC)	0.148 – 0.175
Maximum Permitted CPC (MPCPC)	0.35
Carbon Pass?	Yes
Renewable Energy Ratio (RER)	0.408 – 0.420
Minimum RER	0.2
Renewable Energy Pass?	Yes
Preliminary BER	A2

Compliance	Block D
	Results
Primary Energy (Actual) kWh/m^2.yr	31.27 – 45.89
Energy Performance Coefficient (EPC)	0.222 – 0.279
Maximum Permitted EPC (MPEPC)	0.3
Primary Energy Pass?	Yes
EU Taxonomy Maximum Permitted EPC (MPEPC)	0.27
Primary Energy EU Taxonomy Pass?	1 Sample Apartment above threshold
Carbon Performance Coefficient (CPC)	0.152 – 0.185
Maximum Permitted CPC (MPCPC)	0.35
Carbon Pass?	Yes
Renewable Energy Ratio (RER)	0.401 – 0.424
Minimum RER	0.2
Renewable Energy Pass?	Yes
Preliminary BER	A2

8. Overheating

As recommended in Part L 2022, a full analysis of the thermal comfort and overheating in line with CIBSE TM59 has been completed for the naturally ventilated residential development at Galway Port. Refer to Axiseng Report *"LDA Galway Thermal Comfort Assessment"* for further details on compliance.

9. Limiting the Effects of Solar Gains in Summer Assessment

Solar gain is the rise in temperature and thermal energy within a space caused by absorption of solar radiation (sunlight). The energy from the sun enters buildings primarily through windows, then warms interior surfaces, which then radiate heat. While beneficial in winter for reducing heating needs, uncontrolled solar gain can cause overheating and discomfort, especially in summer, making it a crucial factor in building design and energy efficiency.

9.1 Blocks A and B Commercial Spaces

To assess the solar gain against criteria under Building Regulations Part L for Buildings other than Dwellings 2022 section 1.3.5 *Limiting the effects of solar gain in summer* for solar gain compliance, a dynamic energy modelling simulation was carried out in IESVE software to compare the proposed façade against a benchmark. The following model inputs for the proposed building and benchmarks were considered against the factors detailed below:

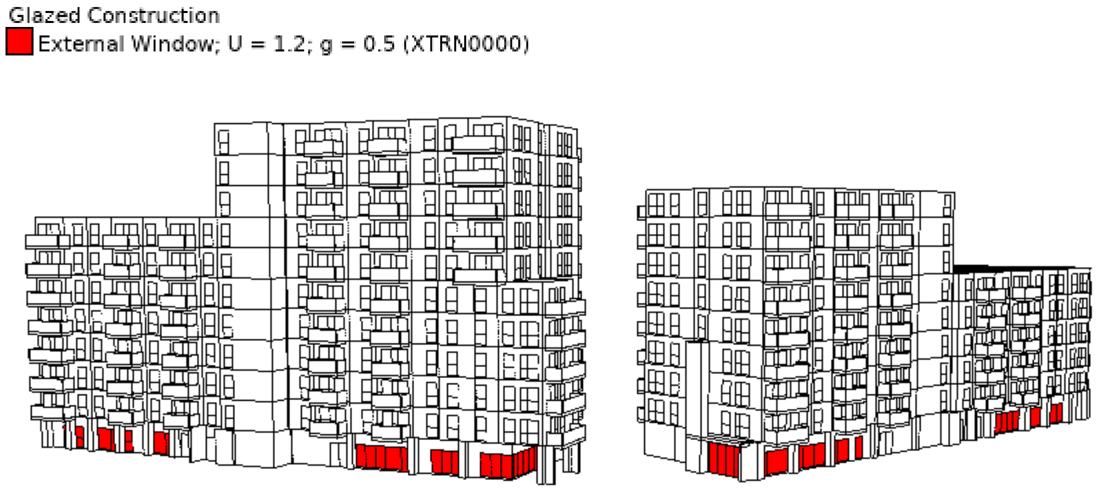
Parameter	NEAP Model Input
Orientation of site / building	According to the site plan
Adjacent building	All four blocks have been included together in the analysis
Weather conditions	Dublin IWEC / UK Part L ManchesterTRY05.fwt
Thermal Properties of the Glazing	Windows– g-value = 0.5*
Shading Device	Balconies and overhangs – In line with Architect's design
Perimeter Zones	-
Calculation Methodology Benchmark Glazing	Benchmark Glazing Type 1 – East-facing façade with full width glazing to a height of 1m having a framing factor of 10% and solar energy transmittance (g-value) of 0.68.
*Refer to *Section 9.1.1 Glazing* for details on glazed constructions assigned	

The solar gains methodology outlined in Part L 2022 (NZEB) follows the UK methodology that has been adopted since 2013. Under SEAI Non-domestic Energy Assessment Procedure (NEAP) modelling guide, which was issued in Q2 2019, the methodology outlined in Section "Limiting Solar Gains in Summer" closely follows what is issued in the UK Part L2A. On that basis, the *UK PartL2A Criteria Solar Gain* toolkit in IESVE software has been used in the dynamic energy model simulation calculation to check against the benchmark.

9.1.1 Glazing

This section shall provide figures to show the locations of glazing for spaces other than dwellings throughout the model. Only occupied spaces/mechanically cooled commercial zones are checked for solar gain limits.

9.1.1.1 Block A & B Only



Northwest View

Southeast View

Northeast View

Southwest View

9.1.2 Solar Gain Results

The results of the solar gain analysis are provided in the table below. All perimeter zones with external glazing are in compliance with Part L 2022 based on the proposed glazing performance.

Space Names (Zones)	Solar Gain (kWh)	Reference Case Solar Gain (kWh)	Part L 2022 Compliance	Maximum g-Value
BA.00.Cafe 1	9327.06	10934.21	Yes	0.5
BA.00.Cafe 2	4862.57	7519.74	Yes	0.5
BB.00.Creche	4244.95	6310.93	Yes	0.5
BB.00.Retail Unit	3585.76	11338.33	Yes	0.5

10. Conclusion

The passive measures included in the design, such as minimising solar gain (overhangs, glazing selection and size), reducing the fabric heat loss through the building envelope and the airtightness target contributes towards reducing the loads on the active systems within the building. The active measures have been designed to reduce the primary energy consumption through intelligent control and highly efficient plant and equipment.

The results in the Part L compliance assessment for Dwellings, shows that the sample apartments assessed all achieve an Energy Performance Coefficient (EPC) less than the Maximum Permitted EPC (MPEPC) of 0.3. The sample apartments also have a Carbon Performance Coefficient (CPC) less than the Maximum Permitted CPC (MPCP) of 0.35, if the measures laid out in this report are implemented. It is concluded that the proposed buildings achieve the NZEB performance specification for energy and carbon dioxide emissions, therefore is in compliance with the performance criteria under section 1.1.2, Building Regulation 2022 Part L for Dwellings.

The results outlined in this Part L report demonstrate that the proposed design is compliant with the L1, L8 (a, b, c, d & e) & Regulation 5 of Building Regulation requirements outlined in Part L 2022 for Dwellings and target a preliminary BER an A2.

Whilst there may be one of the sample apartments not fully meeting the requirements for EU Taxonomy on its own, this is a top floor north facing apartment with increased heat losses and reduced heat gains. When the total is taken of all the primary energy required for the sample apartments, this is less than 10% of the energy benchmark for NZEB for the sample apartments, which is the requirement for EU Taxonomy. Initial calculations for planning have been completed with the default thermal bridging (y) factor (0.15), which may be improved upon during detailed design when the Architect’s design has been completed.

The results in the Part L compliance assessment for Buildings other than Dwellings, shows that the landlord areas of the development achieve an Energy Performance Coefficient (EPC) less than Maximum Permitted EPC (MPEPC) of 1.0. The landlord areas also have a Carbon Performance Coefficient (CPC) less than the Maximum Permitted CPC (MPCP) of 1.15. It is concluded that for Building other than Dwellings, the proposed spaces achieve the NZEB performance specification for energy and carbon dioxide emissions, therefore the landlord areas of the development comply with the performance criteria under section 1.1.2, Building Regulation 2022 Part L for Buildings other than Dwellings.

The results outlined in this Part L report demonstrate that the proposed design is compliant with the L5 (a, b, c, d, e, & h) Building Regulation requirements outlined in Part L Buildings other than Dwellings 2022 and targets a preliminary BER of at least an A3.

The report outlines clear embodied-carbon targets, a methodology (EN 15978 / RICS WLC), and specific reduction measures. We are adopting RIBA/LETI- aligned upfront embodied-carbon targets of 625 $kgCO_2e/m^2$ (A1–A5) for residential and ≤ 750 $kgCO_2e/m^2$ for non-domestic elements, with a commitment to publish a stage ¾ WLC assessment and an Embodied Carbon Reduction Plan at detailed design, tracking material and MEP interventions. This approach mirrors best practice seen in UK/IE Climate Action & Energy Statements and directly addresses prior challenges where lack of embodied-carbon consideration has been cited. Architecture.com

The landlord spaces all meet the requirements for EU Taxonomy as the energy performance is more than 10% of an improvement on the NZEB threshold.

The proposed grey-box spaces have notionally proposed systems included in this report which show they can all comply with Part L. Detailed design of these spaces and compliance with the regulations shall be required during their full fit out when space uses have been confirmed.

It is to be noted that as the design of the proposed development progresses and may change, it is worthwhile reviewing the input specification performance including any potentially upgraded U-values, sanitaryware proposals and HVAC systems to ensure compliance and proposed BER can still be achieved.

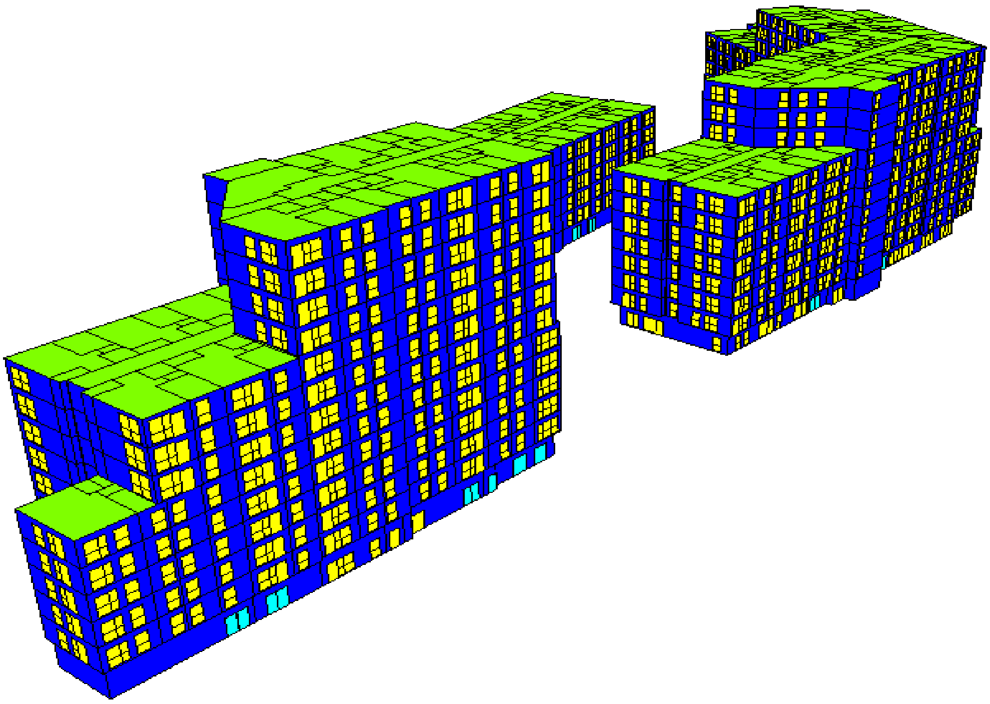
11. Appendices

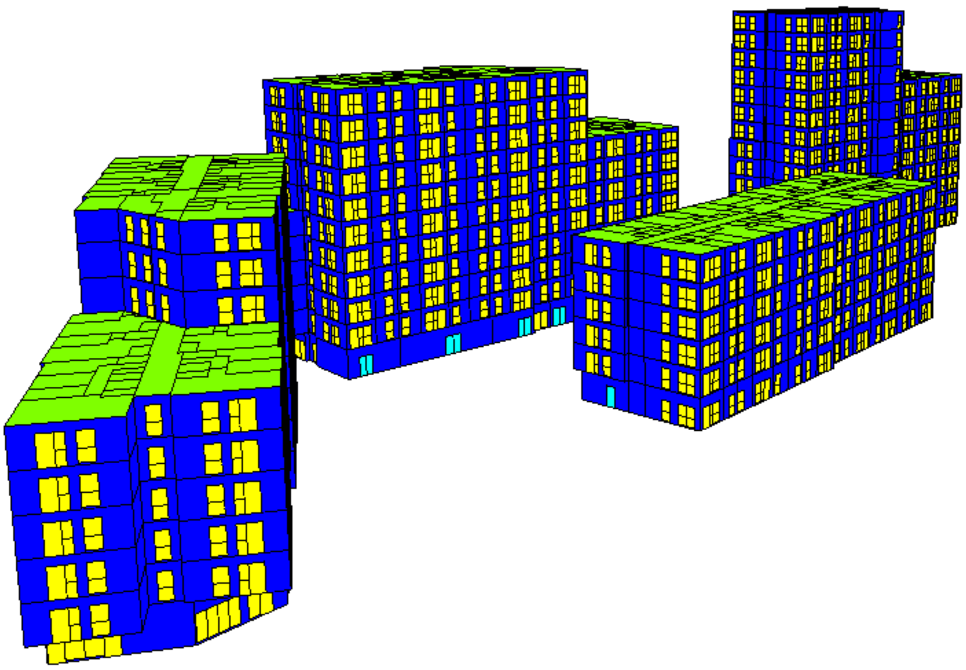
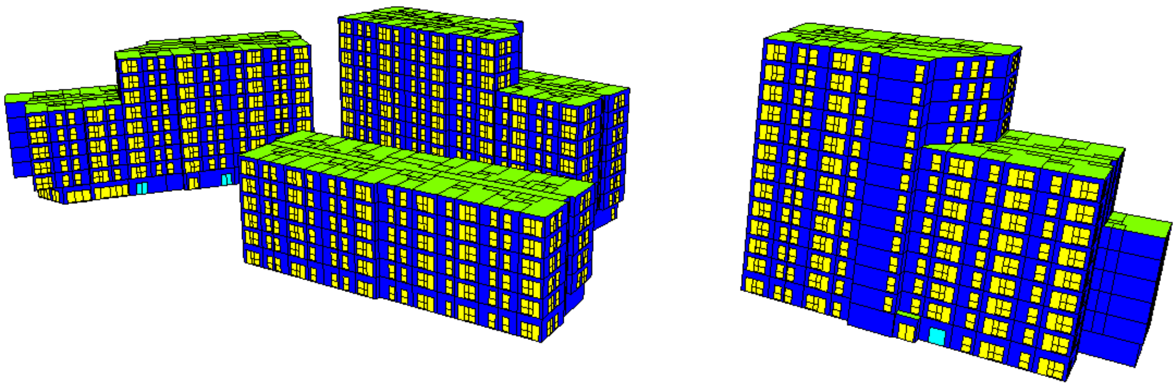
11.1 Assigned Construction Details

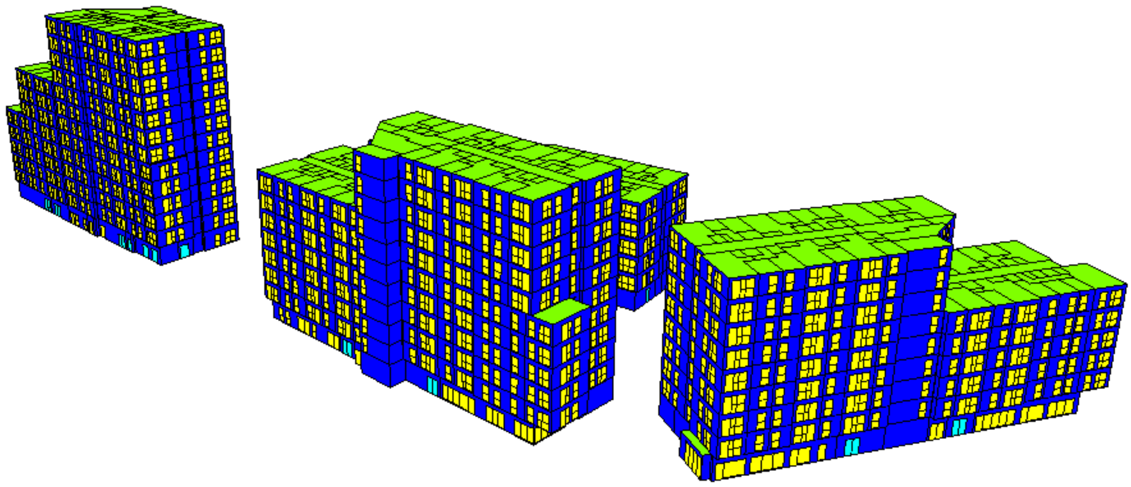
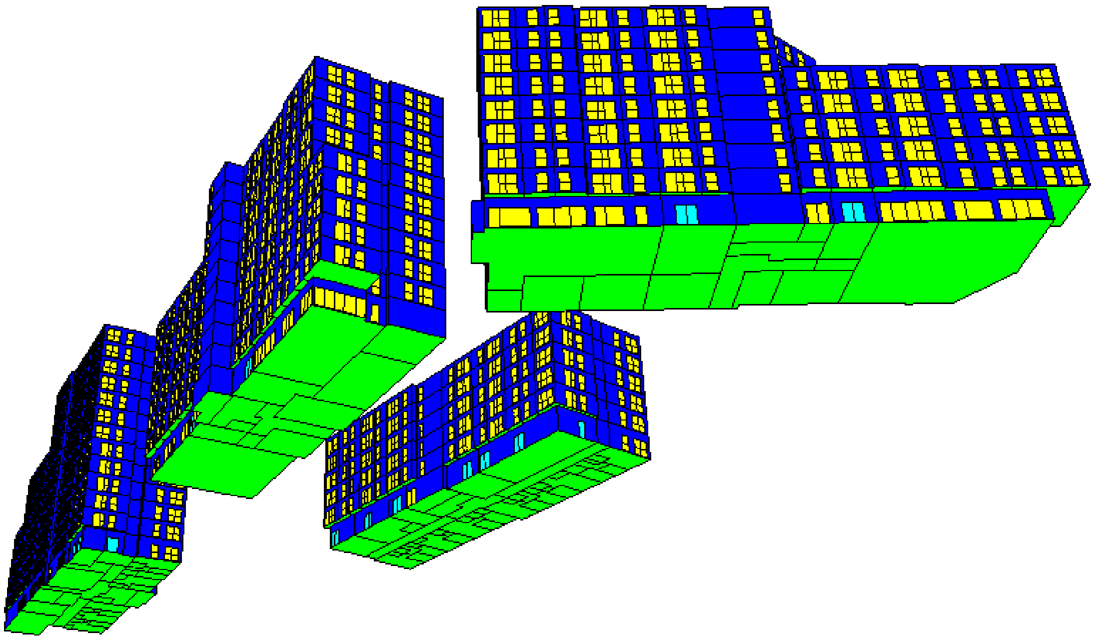
Legend

Construction
- Compartmental Internal Partition; Architect's Details (CMPR0000)
- Exposed Floor; Arhcitect's Details; U = 0.15 (XPSD0000)
- External Wall; Architect's details; U = 0.18 (BBW90-D)
- External Window; U = 1.2; g = 0.5 (XTRN0000)
- Insulated Door (STD_DOOR)
- Insulated Internal Ceiling/Floor (20130007)
- Insulated Stud Partition; Architect's details (NTRN0003)
- Internal Ceiling/Floor (NTRN0001)
- Internal Stud Partition; Architect's details (NTRN0000)
- Roof; Architect's Details; U = 0.15 (RFRC0000)

North



South

East


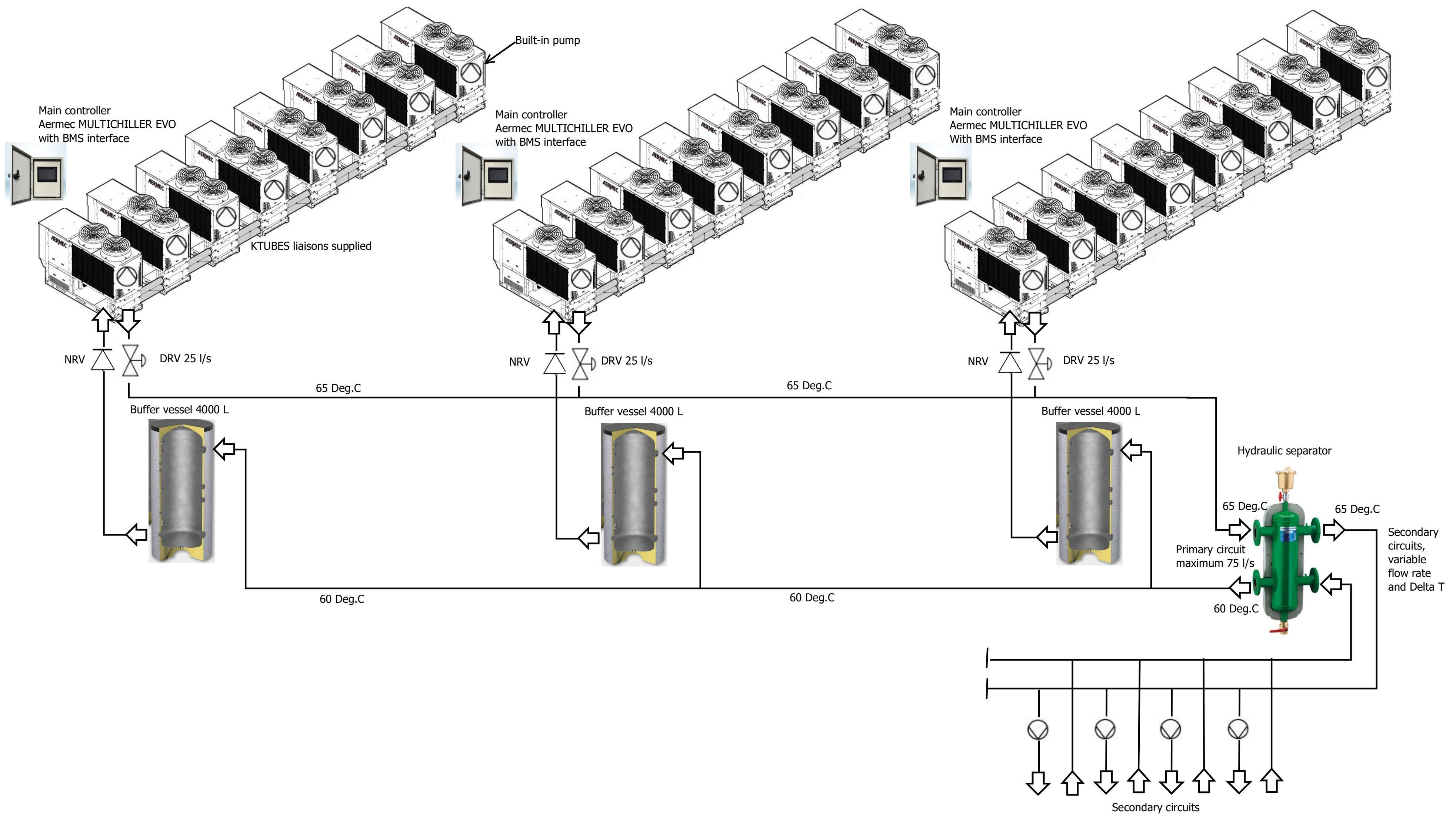
West

View from Below


11.2 Calculation Information for Aermec Heat Pump

145031r2, LDA Galway Port schematic

18/11/2024

3 No. Aermec ASHPs 8 modules PRM0504XH°AV°°P1
511.20 kW at -52 Deg.C ambient, water 60 Deg.C / 65 Deg.C
Built in primary single pump 142 kPa available on each module



From: @seai.ie>
Sent: 14 July 2025 10:56
To:
Cc:
Subject: RE: Galway Port - 145031 final calculation

Hi

Apologies for the delay in coming back to you.

The figures stack up and can be used in DEAP. In the group heating section of the calculation.

As you have calculated separate COPs for both space and water heating, the space heating efficiency must be added first with the proportion of heat based on the Total Heating Energy of the space heating against the total heating energy of space and DHW.

Regards,

From:
Sent: Monday 14 July 2025 09:48
To:
Cc:
Subject: RE: Galway Port - 145031 final calculation

> **Caution:** This is an external email and may be malicious. Please take care when clicking links or opening attachments.

Hi

I wondered if you had had chance to review what has been provided by the heat pump manufacturer as described below and attached? Is this something we can use in the DEAP software for the apartment complex we had discussed previously? Thanks.

Kind regards,

axiseng consulting engineers **|** 47 Mount Street Upper, Dublin 2, D02 AC95
+353 1 491 0044| axiseng.ie | LinkedIn

From:
Sent: 09 July 2025 16:35
To:
Cc:
Subject: FW: Galway Port - 145031 final calculation

Hi

At our last meeting, we agreed that we could calculate a combined SCOP for space heating and DHW for the district heating system heat pumps that would enable us to enter the value directly into the DEAP software.

We have been in correspondence with the heat pump suppliers who have contacted the factory in Italy to help with the calculation.

Based on a district heating network temperature of 58°C and heat interface units in each apartment that will instantaneously heat up DHW and provide space heating, they have calculated,

COPdhw = 2.94
SCOP (space heating) = 2.65 W/W.

The explanation of how they arrived at these figures is described below and in the attached pdfs.

Would you mind reviewing the figures and letting me know if you have any comments or queries? The team are hoping to go for planning soon so if we could agree the SCOP for the DEAP assessments that would be very helpful so let me know if you want to have a call to go through anything.

Thanks a lot,

axiseng consulting engineers | 47 Mount Street Upper, Dublin 2, D02 AC95
+353 1 491 0044| axiseng.ie | LinkedIn

From:
Sent: Wednesday 9 July 2025 15:59
To:
Cc:
<ke
Subject: RE: Galway Port - 145031 final calculation

Hi ,

I received the Energy calculations from the factory, see the attached and my description below.

The calculations are similar to the EN14825 SCOP calculation, in this case not based on the EN 14825 “Average climate” conditions, but on real worst Galway climate conditions known from 2010.
The calculations are based on 1No. ASHP 8 x modules, the 2No. additional 8 x modules ASHP will operate in sequence with the same efficiencies.
For the DHW load, the Table load profile XL from the standard EN16147, to allow the inclusion on the Aermec Energy Analysis Software we had to group the Withdrawal Qtap, see the table below

No.	Hour	Qtap kW/h apart.	x 119 apart.	x 0.06 diversity factor	Groups kWh
1	07:00	0.105	12.495	0.750	25
2	07:05				
3	07:15	1.820	216.580	12.995	

4	07:26	0.105	12.495	0.750	
5	07:30				
6	07:45	4.420	525.980	31.559	
7	08:01	0.105	12.495	0.750	25
8	08:05				
9	08:15	0.105	12.495	0.750	
10	08:25				
11	08:30	0.105	12.495	0.750	
12	08:45	0.105	12.495	0.750	
13	09:00	0.105	12.495	0.750	
14	09:30	0.105	12.495	0.750	
15	10:00	0.105	12.495	0.750	
16	10:30	0.105	12.495	0.750	
17	11:00	0.105	12.495	0.750	
18	11:30	0.105	12.495	0.750	
19	11:45	0.105	12.495	0.750	
20	12:00				
21	12:30				
22	12:45	0.735	87.465	5.248	15
23	14:30	0.105	12.495	0.750	
24	15:00	0.105	12.495	0.750	
25	15:30	0.105	12.495	0.750	
26	16:00	0.105	12.495	0.750	
27	16:30	0.105	12.495	0.750	
28	17:00	0.105	12.495	0.750	
29	18:00	0.105	12.495	0.750	25
30	18:15	0.105	12.495	0.750	
31	18:30	0.105	12.495	0.750	
32	19:00	0.105	12.495	0.750	25
33	19:30				
34	20:00				25
35	20:30	0.735	87.465	5.248	
36	20:45				
37	20:46	4.420	525.980	31.559	
38	21:00				
39	21:15	0.105	12.495	0.750	
40	21:30	4.420	525.980	31.559	
41	21:35				
42	21:45				
43	**Qref**	**19.070**	**2269.330**	**136.160**	**140.000**

- "Overal" includes the Space heating and DHW loads
  - The Space heating calculation based on:
    - 1 x group of 8No. modules for a total capacity of 520 kW and flow 58°C, operating in sequence
    - Linear load from 520 kW at -5.8°C to 50 kW at 19°C ambient
    - coldest conditions in Galway, in 2010, for a heating period from the 1st of October to the 31st of May
  - The DHW calculation based on:

        - 1 x group of 8No. modules for a total capacity of 520 kW and flow 58°C, operating in sequence
        - DHW load 140 kW/day, 365 days, based on the EN 16147 load profile XL for 119 apartments with diversity factor 0.06
        - Conditions in Galway, in 2010, for 365 days, coldest temperature -5.8°C, warmer temperature 23.9°C
    - **Total Heating Energy = 1492252 kWh**
    - **Total Input Energy = 561092 kWh**

- "Space Heating" includes only the Space heating loads
    - The Space heating calculation based on:
        - 1 x group of 8No. modules for a total capacity of 520 kW and flow 58°C, operating in sequence
        - Linear load from 520 kW at -5.8°C to 50 kW at 19°C ambient
        - coldest conditions in Galway, in 2010, for a heating period from the 1st of October to the 31st of May
    - **Total Heating Energy = 1441152 kWh**
    - **Total Input Energy = 543721 kWh**
    - **Seasonal COP = 2.65 W/W**

- Deducting the "Space heating" Heating Energy from the "Overall" Heating Energy, we obtain **51100 kWh** due to the DHW production all along the year
- Deducting the "Space heating" Input Energy form the "Overall" input Energy, we obtain **17371 kWh**
- Dividing the result Heating Energy by the result Input Energy, we obtain a **COPdhw of = 2.94 W/W**

We can note the COPdhw with 2.94 is higher than the SCOP (space heating) with 2.65 W/W.
This is normal, the COPdhw is calculated on real ambient conditions including cold temperature from October to Mai and warmer temperatures and lower total load during the months from June to September, so a much higher efficiency for the ASHPs during this period.
On a DHW efficiency calculated with a test in accordance with EN16147, the ambient temperature is 7°C.

Let me know if you need any further information.

Kind Regards,

Technical Sales Executive

European Industrial Chillers Ltd.
Unit 74 Dunboyne Business Park,
Dunboyne, Co Meath.
Tel: (
Mob:

Delivering Ireland's energy revolution for the benefit of society.
Funded by the Government of Ireland.

Tel: +353 (0) 1 8082100 Web: <="" a="">