

OCSC

O'CONNOR · SUTTON · CRONIN

MULTIDISCIPLINARY CONSULTING ENGINEERS

L395: ROYAL LIVER PHASE 2

BUILDING LIFE CYCLE REPORT

For

Land Development Authority

22 September 2026

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1 EXECUTIVE SUMMARY

This Building Lifecycle Report for the proposed Royal Liver Phase 2 development sets out to address the requirements of the Planning Design Standards for Apartments, Guidelines for Planning Authorities (2025) which state that a building lifecycle report is to be produced with the intent to clearly outline the future operation and management of apartment developments and the long-term management and maintenance structures.

The proposed development will be constructed to the highest standards and in compliance with all relevant guidelines and policies which seek to provide for energy efficient and liveable multi-unit developments that will reduce maintenance costs for residents over time.

In consideration of the above we trust that all relevant parties will be satisfied with the details of this Report in accordance with Section 6.2 of the Apartment Guidelines, 2025.

2 INTRODUCTION

The Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2025 have outlined the requirement for a building lifecycle report to be produced with the intent to clearly outline the future operation and management of apartment developments and the long-term management and maintenance structures.

Section 6.2 of the Apartment Guidelines 2025 requires that apartment applications shall:

"include a building lifecycle report which in turn includes an assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application, as well as demonstrating what measures have been specifically considered by the proposer to effectively manage and reduce costs for the benefit of residents."

This Building Lifecycle Report document sets out to address the requirements outlined above for the proposed Royal Liver Phase 2 development.

3 PROPOSED DEVELOPMENT

The development will consist of amendments to a previously permitted mixed-use development (DCC Reg. Ref.: 4238/19; ABP Ref. PL29S.307804, as amended by DCC Ref.: 4436/23 and DCC Reg. Ref.: 5050/26). The proposed amendments relate solely to the permitted Blocks B1, B2, C1, C2, D1 & D2 (identified as Phase 2). No amendments are proposed to any other permitted blocks.

1. The proposed alterations result in an overall increase of 2 no. units increasing the total overall units from 1196 to 1198. The proposed amended residential development of Block B1, B2, C1, C2, D1 & D2 will consist of a total of 635 no. residential apartments (an increase from 633 no. as permitted), which includes 38 No. Studios, 269 No. 1-Bed, 288 No. 2-Bed- 4-Person and 40 No. 3-Bed- 5-Person, units as follows:

- Alteration of Block B1 from a permitted 11-12-storey building providing for 90 no. apartment units to a 10-storey building providing for 107 no. apartments.

- Alteration of Block B2 from a permitted 10 storey building providing for 90 no. apartment units to a 10-storey building providing for 89 no. apartments.

- Alteration of Block C1 from a permitted 10-storey building providing for 171 no. apartment units to a 10-storey building providing for 144 no. apartments.

- Alteration of Block C2 from a permitted 10-storey building providing for 89 no. apartment units to a 10-storey building providing for 98 no. apartments.

- Alteration of Block D1 from a permitted 9-storey building providing for 87 no. apartment units to a 9-storey building providing for 123 no. apartments.

- Alteration of Block D2 from a permitted 8-storey building providing for 106 no. apartment units to an 8-storey building providing for 74 no. apartments.

2. The reconfiguration of internal layouts of each of the blocks has resulted in the minor shift in the block footprints. The permitted podium between Block B2 and Block C1 is removed with additional public realm and connection to the south proposed. The block amendments result in amendments to permitted communal amenity space with the removal of roof terraces on Blocks C1, C2 and D1 and amendment to roof terraces on Block B1 and B2.

3. Façade modifications are proposed to respond to the revised internal layouts including minor relocation of windows, balconies etc. and a revised approach to the Naas Rd frontage.

4. Alteration of the permitted uses and facade at ground floor level and removal of permitted BTR tenant amenity spaces located in Blocks B1, B2, C1 & C2 to provide for a ground floor level that includes:

• Blocks B1-B2: 1 no. retail/café/restaurant unit, 1 no. café unit, 1 no. community unit, a creche (relocated from Block D1) and associated cycle parking, plant areas and entrances.

• Block C1-C2-D1-D2: 1 no. retail unit, 2 no. retail/cafe/restaurant units, own door residential units, undercroft parking and associated cycle parking, plant areas and entrances.

5. Alterations to the permitted undercroft and basement parking areas under Blocks B1, B2, C1, C2, D1 & D2 to include for alterations to permitted layouts of car parking, cycle parking, plant, waste stores and substation locations.

6. Amendment of Condition 3 (a) of the parent permission (DCC Reg. Ref.: 4238/19; ABP Ref. PL29S.307804) relating to the Build to Rent (BTR) covenant, and its removal as it relates to Blocks B1, B2, C1, C2 & D1.



Figure 1: Proposed Development Site Plan

4 ASSESSMENT OF LONG-TERM RUNNING AND MAINTENANCE COSTS

The Client considered the long-term running and maintenance costs for future residents from the outset of the design process with a view to managing and minimising unreasonable expenditure on a per residential unit basis. This exercise was informed by, and took account of, learning outcomes from previous residential projects together with a consideration of the changes in standards arising from the new apartment guidelines.

4.1 PROPERTY MANAGEMENT COMPANY AND OWNERS MANAGEMENT COMPANY

As noted within The Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2025;

'The Multi-Unit Developments Act, 2011 (MUD Act) sets out the legal requirements regarding the management of apartment developments. In this regard it is advised that when granting permission for such developments planning authorities attach appropriate planning conditions that require:

- *Compliance with the MUD Act,*
- *Establishment of an Owners Management Company (OMC) and:*
- *Establishment and ongoing maintenance of a sinking fund commensurate with the facilities in a development that require ongoing maintenance and renewal.'*

A Property Management Company will be engaged at an early stage of the development to ensure that all property management functions are dealt with for the development and that the maintenance and running costs of the development's common areas are kept within the agreed annual operational budget. The Property Management Company will enter a contract directly with the Owner's Management Company for the ongoing management of the completed development (it is intended that this contract will be for a maximum period of c.3 years and in the form prescribed by the Property Services Regulatory Authority).

The Property Management Company will also have the following responsibilities for the development once completed:

- Timely formation of an Owners Management Company – which will be a company limited by guarantee having no share capital. All future purchasers will be obliged to become members;
- Preparation of annual service charge budget for the development's common areas;
- Apportioning of the annual operational charges in line with the MUD Act (equitable division);
- Engagement of independent legal representation on behalf of the OMC in keeping with the MUD Act - including completion of Developer OMC Agreement and transfer of the common areas;
- Transfer of documentation in line with Schedule 3 of the MUD Act;

- Estate Management / Third Party Contractors Procurement and Management;
- OMC Reporting / Accounting Services /Corporate Services /Insurance Management;
- After Hours Services and Staff Administration.

4.1.1 SERVICE CHARGE BUDGET

The Property Management Company will have a number of key responsibilities most notably, the compiling of the service charge budget for the development for agreement with the Owners Management Company.

In accordance with the Multi Unit Developments Act 2011 ("MUD" Act), the service charge budget typically covers items such as cleaning, landscaping, refuse management, utility bills, insurance, maintenance of mechanical/electrical lifts/ life safety systems, security, property management fee, etc, to the development common areas.

This service charge budget also includes an allowance for a Sinking Fund and this allowance is determined following the review of the Building Investment Fund (BIF) report.

The BIF report once adopted by the Owners Management Company, determines an adequate estimated annual cost provision requirement based on the needs of the development over a 30-year cycle period. The BIF report will identify those works which are necessary to maintain, repair, and enhance the premises over the 30-year life cycle period, as required by the Multi Unit Development Act (MUD) 2011. In line with the requirements of the MUD Act, the members of the OMC will determine and agree each year at a General Meeting of the members, the contribution to be made to the Sinking Fund, having regard to the BIF report produced.

Appendix A outlines what items would typically be included in the Building Investment Fund calculation.

5 MEASURES TO MANAGE AND REDUCE COSTS

5.1 BUILDING DESIGN

The proposed residential buildings are designed in accordance with the Building Regulations, in particular Part D 'Materials and Workmanship', which includes all elements of the construction. The Design Principles and Specification are applied to both the residential units and the communal / amenity parts of the development.

As outlined in 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2025' to have regard for quantitative performance approaches to daylight provisions 'outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (3rd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision'.

Careful consideration was given to the provision of natural daylight within the units. Daylight analysis undertaken by OCSC confirms that the vast majority of all units exceed the recommendations outlined within the BRE Guide in respect to internal daylight levels, thus reducing the reliance on artificial lighting.



Figure 2: Proposed Building Design

5.2 TREATMENTS, MATERIALS AND FINISHES

In selecting the materials to be used for the development consideration has been given to Building Regulations and includes reference to BS 7543:2015 'Guide to Durability of Buildings and Building elements, Products and Components'. The materials proposed by Henry J Lyons are modest, considerate and robust and are in keeping with the surrounding environment. The materials have been selected on the basis of durability, resilience, longevity, and low maintenance.

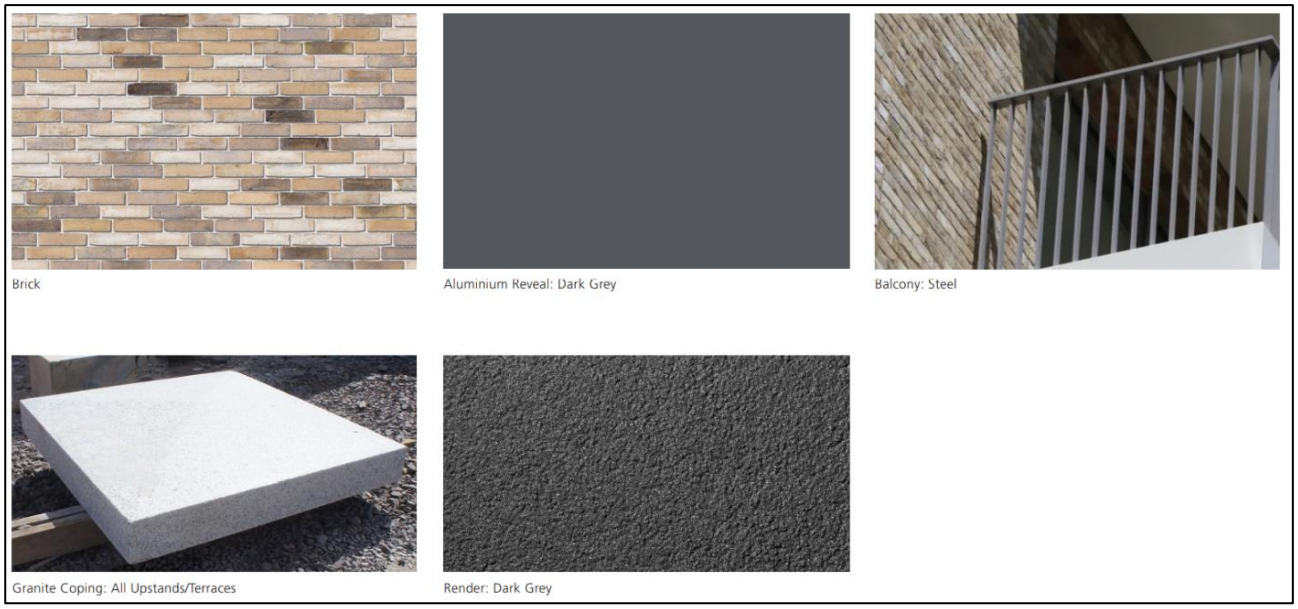


Figure 3: Durable Building Materials with Low Maintenance Requirements

Table 1 below outlines the proposed materials and their benefits selected for the external walls, windows & doors, floors, roof and balconies across the proposed Royal Liver Phase 2 development.

Table 1: Materials selected for the proposed Royal Liver Phase 2 development

Item	Description	Benefit
External Walls	External walls to be faced in 102mm clay facing brickwork with mortar to selected colour. Insulated cavity with appropriate insulation to achieve required u-value as per the performance requirements of Building Regulations TGDL. Inner leaf construction to be reinforced concrete. Fire stopping / cavity barriers to be installed to meet the performance requirements of Building Regulations TGDB and the Fire Safety Certificate for the development.	Brickwork finishes require low maintenance and have a long lifespan.
Windows & Doors	Window cills to be polyester powder coated aluminium to match window colour. Low maintenance double glazed aluminum clad timber windows to selected RAL colour, with access door onto private balconies to match.	Aluminium is a durable and low maintenance material with a long lifespan. Aluminum-clad timber windows provide the natural insulation of timber with the low-maintenance

		durability of aluminum, making them an excellent choice for high-performance, long-lasting windows.
Roof	Roof slab to be fully waterproofed and insulated as part of an extensive green roof system. Green roof system to consist of a vegetation layer, suitable substrate, filtration, drainage channels and barrier sheets on top of a concrete deck.	A green roof provides attenuation to storm water run-off, increased bio-diversity as well as increased thermal performance.
Balconies & Balustrades	Prefabricated steel balconies. Terraces on ground floor area finished with paving slabs. Balconies on upper levels are finished in a non-combustible aluminium decking system.	Prefabrication allows for the balconies to be manufactured off-site, reducing on-site construction time and minimising disruption during the installation phase. Both steel and aluminum require minimal maintenance compared to traditional materials and are fully recyclable, contributing to the overall sustainability of the project.
Internal Finishes	Internal apartment walls to be constructed of metal stud clad both sides with plasterboard taped and jointed / skimmed ready for decoration. Plywood grounds to be allowed for in areas for fixing items such as radiators, kitchen units / bathroom units / sanitary fixings etc. Internal walls may be required to be of solid construction internal walls will be clad both sides with plasterboard taped and jointed / skimmed ready for decoration.	Internal finishes selected require low maintenance and do not require regular replacement.

5.3 LANDSCAPING

Throughout the design process Mitchells has ensured that preservation and robustness were key considerations when selecting materials for the landscaped elements of the development. For landscaped areas to remain inviting and utilised by occupants throughout the life expectancy of the development, durability and low maintenance are key criteria.

Table 2 outlines key design and material choices for a development project, explaining what each measure involves and the benefits it delivers. The focus is on durability, sustainability, low maintenance, and supporting active travel.

Table 2: Landscape design in the proposed Royal Liver Phase 2 development

Item	Measure Description	Benefit
Paving and Decking Materials	Use of robust, high quality paving materials, with robust and proven details to be durable for bikes, play etc.	Ensure longevity and require low on-going maintenance.
Site Layout & Landscaping Design	High quality landscaping both hard surface (for active travel and car parking and pavements) and soft landscaping with planting and trees.	Ample room for cycles and pedestrians to promote forms of transport other than by car.
Materials	Sustainable, robust materials, with high slip resistance to be used for paving. Durable and robust equipment (e.g. play, exercise, fencing etc.) to be used throughout.	Robust materials and elements reduce the frequency of required repair and maintenance.
Plant and Tree Species	The shrubs and tree species selected will be resilient and robust in their surrounding environment, native where feasible, and adaptive and suitable to the Irish climate.	Reduced requirement for irrigation: these will thrive in windy and dry conditions and will look well all year round. No need for continuous replacements of the planting and trees.
Green roof	Green Roof and Blue Roof systems will be installed.	Allowing for localised attenuation of water for re-use on site.

5.4 WASTE MANAGEMENT

AWN Consulting has set out the following measures in relation to waste management which will be utilised within the scheme and will benefit the future residents.

Table 3 below outlines the waste management measures that will be implemented within the proposed development and the benefit they deliver.

Table 3: Waste management description in the proposed Royal Liver Phase 2 development

Measure	Description	Benefit
Construction & Demolition Waste Management Plan	This application is accompanied by a Construction and Demolition (C&D) Resource & Waste Management Plan (RWMP).	The Plan demonstrates how the scheme will comply with national, regional, and local waste legislation along with best practice.
Operational Waste Management Plan	This application is accompanied by an Operational Waste Management Plan.	The Plan demonstrates how the scheme has been designed to comply with national, regional, and local waste legislation, waste bye-laws and relevant best practice guidelines.
Storage of Non-Recyclable Waste and Recyclable Household Waste	Provision of dedicated communal waste storage areas for the residential apartment blocks and a separate commercial waste storage area, with sufficient capactiy for the weekly storage of Dry Mixed Recyclables (DMR), Mixed Non-Recyclable waste (MNR), organic waste and glass.	Easily accessible to residents, commercial tenants, facilities management personnel and waste contractors, facilitating effective waste segregation, minimising litter generation, reducing contamination of recyclable materials and providing flexibility in waste collection services.
	Residential waste will be segregated into DMR, MNR, organic waste and glass. Commercial waste will be segregated into DMR, MNR, organic waste and glass, cardboard and plastic, with provision of baling for cardboard and plastic where appropriate.	Complies with the requirements of national regional, and local waste legislation, waste bye-laws, along with best practice. Helps reduce potential waste charges and does not limit waste contractor selection.
	Secure access-controlled waste storage areas for residential and commercial uses.	Reduce potential for fly tipping by residents and non-residents.

	Well-signposted waste storage rooms and waste receptacles.	Help reduce potential cross contamination of waste and reduce waste charges.
Organic Waste Management	Organic waste receptacles will be provided. Residents and commercial tenants will segregate food waste for collection by an authorised waste contractor.	Supports compliance with waste legislation and national policy regarding the segregation and recovery of biodegradable waste and promotes diversion of organic waste from landfill.
Waste Education and Signage	Waste storage areas will be fitted with appropriate signage and residents / tenants will be provided with information on waste segregation and recycling.	Encourages correct segregation, reduces contamination and improves recycling performance.

5.5 HUMAN HEALTH AND WELLBEING

The development has been designed with the health and wellbeing of the user in mind. The design team considered the importance of natural daylight by providing large, glazed windows across the development.

Special emphasis will be placed on materials finishes with a low VOC content further enhancing the indoor air quality of the units.

In addition, all units will comply with the accessibility requirements as required building regulations and the scheme is designed to incorporate passive surveillance of communal areas.

Another positive factor in the health and wellbeing of the scheme are the communal amenity spaces. These areas will provide spaces for residents to gather, to relax, to work and to exercise which will foster a sense of community.

5.6 ENERGY AND CARBON EMISSIONS

This section sets out various energy conservation measures which have been incorporated into the design of the development to reduce both the maintenance requirements and operational costs for future residents of the scheme.

The proposed development will comply with Part L 2022. As part of the development's efforts to further reduce energy consumption, the project is targeting an A BER (Building Energy Rating) throughout. Extensive work

has been carried out to develop a balanced design approach to achieve these onerous targets with a number of energy efficient features being incorporated into the design from the early stages.

5.6.1 ENERGY EFFICIENT DESIGN

The design of the development follows the Energy Hierarchy Plan which aims to:

- First, reduce energy demand by improving the building's thermal envelope, increasing air tightness, improving thermal transmittance and applying passive design techniques;
- The second step is to utilise energy in the most efficient way through the selection and installation of energy efficient plant and equipment;
- The final step is to introduce energy from renewable sources to reduce the burden on fossil fuels.

Table 4 below outlines the elements (based on passive and active measures) that aid in the reduction of energy consumption, carbon emissions and cost throughout the building lifecycle. The table also provides information to be used in the Dwelling Energy Assessment Procedure (DEAP) assessment for each unit in the development to show compliance with the Nearly Zero Energy Building (NZEB) criteria.

Table 4: Measures to reduce energy consumption and carbon emissions

Measures	Description	Benefit
High Performance Construction Fabric	The construction U-values being analysed for each residential unit within the development is outlined in the building regulations Technical Guidance Document – Part L (2022). Current U-value Targets (W/m².K) for the residential aspects of the development • Window: 1.4 • External Wall: 0.18 • Flat Roof: 0.18 • Ground Contact/ Exposed Floor: 0.18 (0.15 if underfloor heating installed) The construction U-values being analysed for the non-residential buildings are: • Window: 1.4 • External Wall: 0.21 • Flat Roof: 0.20 • Ground Contact/ Exposed Floor: 0.21 (0.15 if underfloor heating installed)	Minimising heat losses through the buildings fabric as well as a lower then required air permeability rate, helps to ensure lower energy consumption rates and associated carbon emissions are achieved throughout the year. Reduces overall cost of heating for the end user.

	High-performance building fabric elements have been selected in order to minimise unnecessary heat loss from the internal environment. During design, a number of passive designs solutions have been considered for implementation throughout. The size of the windows have been optimised to maximise daylight in order to reduce dependence on artificial lighting while selecting the most appropriate glazing G-value to minimise unnecessary solar gains during the summer months and reduce the risk of dwelling overheating issues in accordance with CIBSE TM59 criteria. The window design has also been carefully designed to provide adequate openings to reduce the risk of overheating during the warm summer months. In addition to the reduction in energy consumption and associated carbon emissions for space heating and ventilation through a high-performance fabric, high efficiency heating systems are being proposed for use throughout the development. This has a net effect of further reducing embodied energy consumption associated with the wasteful use of fossil fuels, as well as the reduced input now required from the national electricity grid and from fossil fuel sources.	
Air Tightness Construction	The building will be designed to ensure it will achieve compliance and also exceed the air tightness requirements outlined in the Part L (2022) TGD document. The current proposal for air tightness in the Part L document is set to a maximum value of 5.0 $m^3/hr/m^2$ @50Pa. The development will aim to achieve a minimum air tightness rate of 3.0 $m^3/hr/m^2$ @ 50Pa (or 0.15 ach infiltration equivalent) per dwelling.	Minimising heat losses through the building fabric, in addition to an increased air tightness level, will reduce space heating requirements. This reduces emitter sizes and inevitably the energy and carbon footprint of the development.

Thermal Bridging	The limitation of thermal bridging will be achieved in accordance with guidance under Section 1.3.3 and Appendix D within the Technical Guidance Document Part L (2022) regulations. After the key junctions are identified, the transmission heat loss coefficient (Y factor) can be calculated using Psi values which are based on as-built construction details as well as confirming no risk of surface condensation. In accordance with Part L (2022), the façade junctions will be designed to achieve a Y factor less than 0.15 W/m^2.K.	A good thermal bridging factor will aid in minimising heat losses at junctions between construction elements, thus further lowering energy consumption and carbon emission rates. Good thermal bridging design will also eliminate the risk of surface condensation, contributing to a healthy internal environment.

Natural Daylight & Artificial Lighting	Provision for natural daylight in modern buildings helps to create a better internal environment for occupants helping to assist in the well-being of the inhabitants. Daylight can also represent an energy source through the reduction in the reliance on artificial lighting. The provision of higher levels of glazing maximises the use of natural daylight to help further enhance visual comfort, without compromising thermal performance. This will require further analysis to ensure the requirements of CIBSE TM59 are also adhered to in relation to overheating criteria. All light fittings are to be based on LED type (A+ Rated bulb) located throughout each space, such as bedroom, lobby, living/dining etc. A significant reduction in electrical energy usage will be achievable through the use of high efficiency fixtures.	Enhance indoor environment quality through the maximisation of natural daylight. Reducing electrical load whilst also maximising internal comfort will aid in reducing the overall energy usage and carbon footprint of the development.
Mechanical Ventilation with Heat Recovery	Each apartment is to be fitted with a high efficiency balanced mechanical ventilation with heat recovery system in order to sufficiently ventilate each dwelling space. The system works by extracting stale air from rooms like kitchens and bathrooms and passing it through a heat exchanger. The heat from the outgoing air is transferred to the incoming fresh air, which is then circulated throughout the building.	This is a highly efficient system that provides fresh, filtered air while minimising heat loss and reducing the risk of condensation and mould growth. MVHR contributes to a highly sustainable and energy-efficient development as the recovered heat is reused instead of being lost to the environment.
Hot Water System & Appliances	Low flow sanitary fixtures to be specified throughout. All hot water taps, including the shower head fittings to utilise flow restrictor devices to allow for the conservation of water use as well as reducing energy used to heat hot water.	Through the restriction of hot water usage, demands on the heating plant are reduced. As a result, equipment size can also reduce. This reduces the cost of utility bills to the tenant by also reducing equipment operating hours.

Renewable Obligations	The building regulations state that 20% of the primary energy delivered to a dwelling must be obtained from renewable energy technologies. Heat pump systems are classified as renewable technologies under Part L (2022).	The use of heat pumps reduces energy consumption, through the utilisation of renewable ambient energy, and contributes to lower operational costs for end users. This approach also delivers a reduction in overall energy demand and the associated carbon emissions of the development

5.6.2 NEARLY ZERO ENERGY BUILDINGS STANDARD (NZEB)

The NZEB method of assessment is based on the Technical Guidance Document (TGD) Part L (2022) – Conservative of Fuel and Energy. This document sets out the minimum energy performance requirement for buildings required to achieve the Nearly Zero Energy Buildings standard.

The Part L (2022) document states that:

"Any new residential new building should be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of carbon dioxide (CO_2) emissions associated with this energy use insofar as is reasonably practicable".

The Energy Performance of Buildings Directive (EPBD) set out targets to be achieved by European countries in relation to new buildings:

"1. Member States shall ensure that new buildings are zero-emission buildings in accordance with Article 11:

(a) from 1 January 2028, new buildings owned by public bodies; and

(b) from 1 January 2030, all new buildings;

Until the application of the requirements under the first subparagraph, Member States shall ensure that all new buildings are at least nearly zero-energy buildings and meet the minimum energy performance requirements laid down in accordance with Article 5. Where public bodies intend to occupy a new building that they do not own, they shall aim for that building to be a zero-emission building"

Additionally, the EPBD sets out the importance of reducing the dependence on fossil fuels in buildings and to accelerate efforts to decarbonise and electrify their energy consumption:

"In order to enable the cost-effective installation of solar technologies at a later stage, all new buildings should be 'solar-ready', that is, designed to optimise the solar generation potential on the basis of the site's solar irradiance, enabling the installation of solar technologies without costly structural interventions. In addition,

Member States should ensure the deployment of suitable solar installations on new buildings, both residential and non-residential, and on existing non-residential buildings. The large-scale deployment of solar energy on buildings would make a major contribution to shielding more effectively consumers from increasing and volatile prices of fossil fuels, reduce the exposure of vulnerable citizens to high energy costs and result in wider environmental, economic and social benefits."

As a result of the analysis carried out on the proposed development by engineers, it can be concluded that, all units within the proposed development have been shown to achieved Part L (2022) compliance with respect to Energy, Carbon and Renewable performance requirements.

5.7 TRANSPORT AND ACCESSIBILITY

5.7.1 ACCESS TO PUBLIC TRANSPORT

The proposed development benefits from excellent public-transport connectivity, with bus stops located directly outside the site on both the Naas Road and Kylemore Road, and additional stops distributed along these corridors. The Kylemore Luas stop is also situated approximately 0.5 km from the development, providing further high-capacity transport options. As illustrated in the 'Existing Public Transportation Linkages' diagram below, these connections collectively ensure strong and convenient public-transport accessibility to the site.

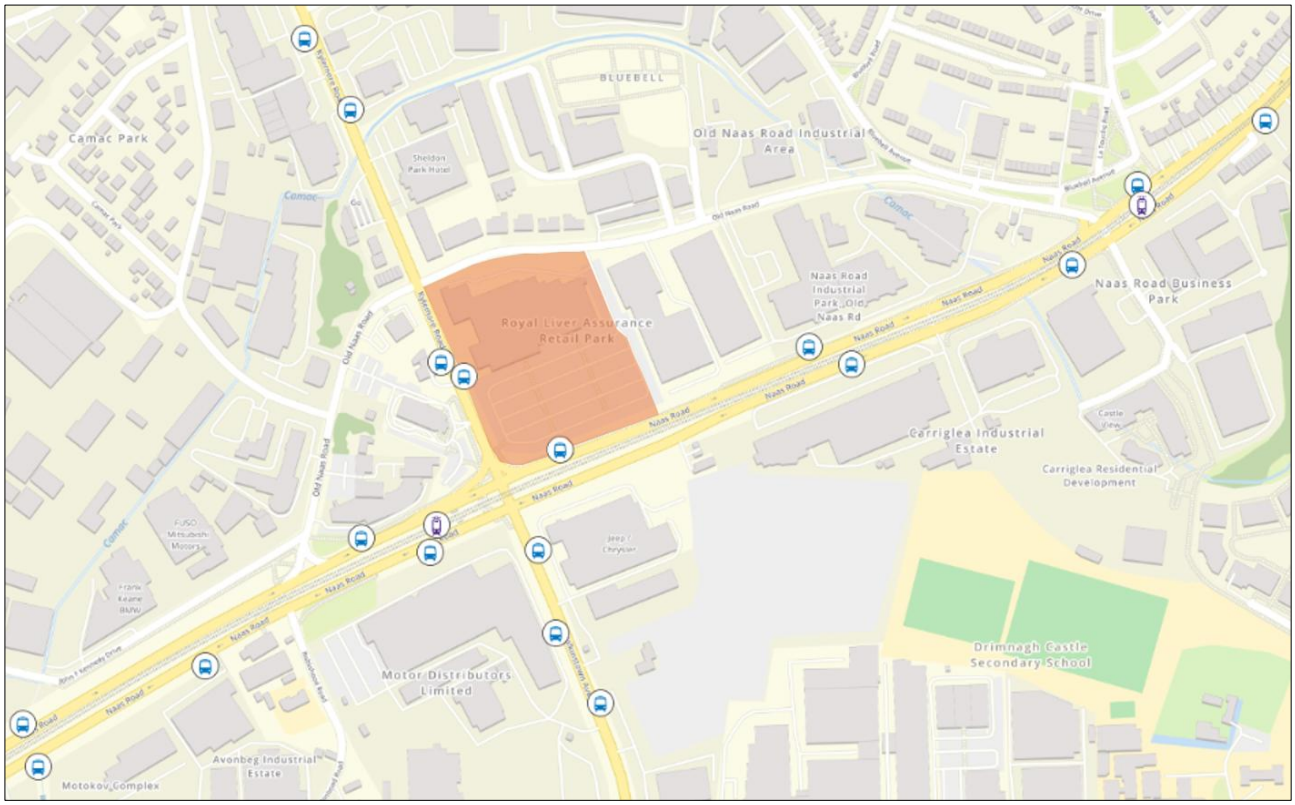


Figure 4: Existing Public Transport Linkages (source: Transport for Ireland)

5.7.2 CYCLE PARKING, CAR SHARING AND E-CHARGE FACILITIES

The proposed development will provide car and cycle parking for residents and visitors. It will include EV enabled spaces, dedicated Disabled Accessible and age friendly parking, and secure high quality bicycle storage including cargo bicycle and motorcycle parking spaces. These measures ensure compliance with relevant standards and support sustainable and inclusive travel choices.

6 CONCLUSION

The proposed Royal Liver Phase 2 development will be constructed to the highest standards and in compliance with all relevant guidelines and policies which seek to provide for energy efficient and liveable multi-unit developments that will reduce maintenance costs for residents over time.

Considering the key matters outlined in the preceding sections, it is considered that this report provides sufficient information to address the requirements of Section 6.2 of the Apartment Guidelines, 2025, and to satisfy the relevant parties in this regard.

7 VERIFICATION

This report was verified by:

Karla Reyes, M.Sc. Renewable Energy Systems, B. Hons. Environmental Engineering

Energy Engineer

O'Connor Sutton Cronin & Associates

Appendix A ITEMS INCLUDED IN TYPICAL BIF CALCULATION

The table below outlines what items would typically be included in the Building Investment Fund calculation.

Ref	Element	Life Expectancy
1.00	**Roof**	
1.01	Roof covering incl. insulation to main roofs	18
1.02	Parapets	18
1.03	Fascia/Soffits	18
1.04	Roof access hatches	25
1.05	Specialist roof systems - fall arrest, etc.	25
1.06	Waterproofing details to paved areas	12
2.00	**Elevations**	
2.01	Decorate rendered panels (TBC)	25
2.02	Exit/Entrance doors	25
2.03	Rainwater goods	20
2.04	External fixings	5
2.05	Balcony floor finishes	25
2.06	Balcony handrails	15
3.00	**Staircores & Lobbies**	
3.01	Ceilings	7
3.02	Walls	7
3.03	Joinery	7
3.04	Fire Doors	25
3.05	Carpet tile	15
3.06	Entrance mats	10
3.07	Nosings	12
3.08	Floor Tiles	20
3.09	Furniture & Equipment	18

4.00	External & Car Parks	
4.01	Parking spaces and numbering painting	7
4.02	Bin Store, Plant room doors, ironmongery etc	15
4.03	Bike Stands	12
5.00	**M&E Services**	
5.01	Relamping (common areas)	7
5.02	Internal light fittings	18
5.03	External light fittings	18
5.04	Smoke detector heads (common areas)	18
5.05	Manual break glass units	18
5.06	Fire alarm panel	18
5.07	Lift car and controls incl. lift equipment	25
5.08	AOVs	25
5.09	Security access controls	15
5.1	External mains water connection	20
5.11	Electrical mains and sub-mains distribution	20
5.12	Emergency lighting	20
5.13	Waste pipes, stacks, vents etc	20
6.00	**Exterior**	
6.01	External boundary treatments	60
6.02	External signage	18
6.03	Landscaping	18
6.04	CCTV provision	15
6.05	External handrails and balustrades	18

OCSC

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