

MOLA
Architecture

Building Lifecycle Report

Priorsland Cherrywood SHD

March 2022

PLD18-MOLA-XX-XX-RP-A-XX003

Contents

Introduction

Proposed development

Section 1

- 1.1 Property management of the common areas
- 1.2 Service charge budget

Section 2

- 2.1 Building Design / Materials
- 2.2 Landscape
- 2.3 Waste management
- 2.4 Health and well being
- 2.5 Management
- 2.6 Transport

Section 3

- 3.1 Building Energy Report

Appendix A - Phases of the Life Cycle of BS7543; 2015

Introduction

The Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (December 2020) provides policy guidance on the operation and management of apartment developments with the stated aim of introducing certainty regarding their long-term management and maintenance structures.

Section 6.11 - 6.14, Operation and Management of Apartment Developments, state that consideration of the long-term running costs and the eventual manner of compliance of the proposal with the Multi-Unit Developments Act, 2011 are matters which should now be considered as part of any assessment of a proposed apartment development. To achieve this policy objective, planning applications for apartment developments must include a Building Lifecycle Report which is referenced in section 6.13 of the Apartment Guidelines 2020;

“Accordingly, planning applications for apartment development 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.” (Section 6.13 of the Apartment Guidelines 2020)

This Report has been prepared by design team members on behalf of 1 Carrickmines Land Limited in response to the above objective. It is divided into three sections;

Section 1

Assesses long term running and maintenance costs as they would appear on a per residential unit basis at the time of application.

Section 2

Measures considered methodology and building aspects that aim to effectively manage and reduce costs for the benefit of the residents.

Section 3

Provides a detailed energy report for the proposed development.

Prepared by:

MOLA Architecture
PUNCH Consulting Engineers
Dermot Foley Landscape Architects
FALLON Consulting Engineers
McGill Planning

Proposed Development

The development will comprise a mixed-use village centre and residential development of 443 no. units comprising 6 no. blocks (A-F) of apartments (up to 5 storeys with basement/undercroft parking) providing 402 no. apartments units (146 no. 1-beds; 218 no. 2-beds and 38 no. 3-beds), and 41 no. houses (19 no. 3-beds and 22 no. 4-beds). All apartments provided with private balconies/terraces. Provision of indoor residential facilities to serve apartment residents.

The Village Centre and non-residential elements will comprise a supermarket, local retail/retail service units, non-retail commercial units, creche, gym, community space, and offices (High Intensity Employment) use.

Provision of car/bicycle/motorcycle parking; ESB sub-stations; bin storages areas, and all associated plant areas.

Provision of the first phase of Priorsland Park (on lands within the applicant's ownership) and other public and communal open spaces.

Construction of Castle Street through the subject lands and two road bridges across the Carrickmines Stream, one to serve the future school site/ park, the second to provide pedestrian and cyclist access to the Carrickmines Luas station and future Transport Interchange to the north. Provision of an additional pedestrian bridge to the park. Provision of an acoustic barrier along the southern/western edge of the site.

All associated site development works, landscaping, boundary treatments and services provision.



Section 1

An assessment of long term running and maintenance costs as they would apply on a residential unit basis at the time of application.

1.1 Property Management of the Common Areas

A property management (Estate management) company will be carefully selected and engaged at an early stage of the development to ensure that all property management functions are dealt with for the development and that the running and maintenance costs of the common areas of the development are kept within the agreed annual operational budget. This will involve the management of all four proposed apartment blocks. The property management company will enter into a contract directly with the Owners Management Company (OMC) for the ongoing management of the built development. This contract will be for a maximum period of 15 years and in the form prescribed by the PSRA. The Property Management Company will undertake the subsequent tasks for the apartment development upon completion:

- Appropriate establishment of an Owners Management Company (OMC) – which will be a limited company having no share capital. Members of this company can be elected and re-elected as directors on annual basis.
- Preparation of annual budget, which will determine the service charge for the development common areas. This will be inclusive for and apartments.
- Fair and equitable apportionment of the Annual operational charges in line with the Multi Units Development Act 2011 (MUD Act).
- 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 common areas.
- Transfer of documentation in line with the MUD Act.
- General Estate Management
- Third Party Contractors Procurement and management.
- OMC Reporting.
- Accounting duties
- Corporate Duties.
- Insurance Management.
- After Hours Services, and emergency contact point for building defects

1.2. Service Charge Budget

The property management company has several key responsibilities, mainly the compiling of the service charge budget for the development for agreement with the OMC. The service charge budget covers items such as:

- Street Cleaning
- General upkeep and cleaning of external common areas, roof terraces, gallery access points
- General Cleaning and upkeep of internal common areas
- Landscaping and play area
- Refuse management,
- Utility bills,
- Insurance,
- Maintenance of mechanical/electrical lifts/life safety systems,
- Security Management,
- Property management fee, etc., to the development common areas in accordance with the Multi Unit Developments Act 2011 (“MUD” Act).

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 prepared for the OMC.

The BIF report, once adopted by the OMC, 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 2011.

Section 2

Measures specifically considered to effectively manage and reduce costs for the benefit of the residents.

2.1 Building Design / Materials

The practical implementation of the Design and Material principles has informed the design of internal layouts, detailing of the proposed apartment buildings, and building facades. The façade materials will consist of brick, pre-cast concrete, glazing, and profiled metalwork. The apartment 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 apartment units and the common parts of the building and specific measures taken include:

Measure	Description	Benefit
Site layout	<p>A single vehicular access route has been provided.</p> <p>Surrounding the buildings, high quality soft and hard landscaping cater for residents. The landscaping will be fully compliant with the requirements for Part M / K of the TGD and will provide level access and crossings for wheelchair users and pedestrians with limited mobility. Designated car parking including accessible & visitor car parking reduces the travel distances for visitors with reduced mobility.</p>	<p>No through route limits car activity to residents and visitors only. Reducing the movement of cars increases the safety for pedestrians and cyclists.</p> <p>High quality residential environments reduce vandalism and antisocial behavior issues.</p>
Daylight to apartments	<p>Consideration for approaches to daylight provisions as outlined in guides such as the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) and BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' should be followed.</p>	<p>Good daylight and sunlight contribute to making a building energy-efficient. It reduces the need for electric lighting and good solar gain can reduce heating requirements.</p>

Balconies & openable windows	Use of inset balconies shelters residents from prevailing wind and rain.	Increases use of private amenity space
	Operable windows allows individuals to clean windows themselves	Reduces cost and reliance on 3rd party contractors for cleaning & maintenance
Podium Ventilation	Naturally ventilated podium car parking	Omits need for mechanical ventilation system therefore reducing cost and associated maintenance/future replacement.

Measure	Description	Benefit
Materials generally	<p>Consideration has been given to BS 7543:2015, 'Guide to Durability of Buildings and Building elements, Products and Components', which provides guidance on the durability, design life and predicted service life of buildings and their parts.</p> <p>All common parts of the proposed apartment building and, the durability and performance of these are designed and specified in accordance with Figure 4; Phases of the Life Cycle of BS7543; 2015. (Please see Appendix B for this figure). The common parts are designed to incorporate the guidance, best practice principles and mitigations of Annexes of BS 7543: 2015 including:</p> <ul style="list-style-type: none"> • Annex A Climatic Agents affecting Durability • Annex B Guidance on materials and durability • Annex C Examples of UK material or component failures • Annex D Design Life Data sheets 	Ensuring that the long-term durability and maintenance of Materials is an integral part of the Design and Specification of the proposed development. Eliminating/reducing the need for any future maintenance reduces costs.
Proposed Materials	Use of variety of brick tones and segments of pigmented render are proposed to building envelope across the site.	Requires no ongoing maintenance.

2.2 Landscape

Measure	Description	Benefit
Site Planning	The landscape has been designed to respond to site conditions and influence the masterplan in order to create a unique user experience. There are a variety of spatial typologies and scales which have been programmed to cater for a number of user groups and activities such as play for toddlers and older children, exercise, seating areas and areas for community gatherings.	Both the physical and visual connection to landscape provides positive impact on health and wellbeing of the community. The creation of spaces on larger and smaller scales caters for individual activities or groups and thus encourages residence to engage with the natural environment and one another.
Green Roofs	Use of green roofs and traditional roof coverings with robust and proven detailing to roof elements.	Attenuation reduces the burden on vulnerable rainwater goods, resulting in fewer elements that could require replacement or repair.
Hard Landscape	The selection of hard landscape materials is determined by function but also to provide a cohesive palette of materials throughout. Materials are chosen for durability, but where practical are proposed to be constructed in a way which is sensitively integrated with lawn and soft landscape, in order to minimise the impact of hard landscape surfaces. Furniture and equipment (e.g. play, exercise, fencing etc.) will be durable and robust with multifunctional uses with soft pour at play and exercise areas.	The use of robust high quality paving materials is intended to provide materials that reduce the need for ongoing maintenance costs. Other materials such as for play, seating, fencing etc. are sustainable and robust material types that are designed to reduce the frequency and need for repair and maintenance over time.
Soft Landscape	The landscaped public space at grade and podium gardens will incorporate dense planting. There will also be a soft landscaped green buffer zone and pedestrian footpath to link to the Park. All proposed planting species have been selected based on their suitability for their location. Native plants have been included where suitable to assist in improving urban biodiversity and diversify the pollination ability within Ireland in accordance with the All Ireland Pollination Plan. All planting will be provided with the suitable depth of topsoil and will provide adequate growing space for planting. All landscaping will be implemented and maintained in accordance with the maintenance and management schedule.	The soft landscaping should be appropriate to the location and be able to be maintained and managed at reasonable cost. It will have a net gain for bio-diversity, provide a changing landscape to follow the seasons and thus create interest and positive impacts on residence. Soft landscape areas drain more naturally and recharge the water table while creating habitat.

2.3 Waste Management

Measure	Description	Benefit
Construction and Operational Waste Management Plan	The planning application is accompanied by a Outline Construction and Demolition Waste Management Plan	The report demonstrates how the scheme has been designed to comply with national regional, local waste legislation and with best practice. The report also provided as a basis for the contractor to develop a construction stage waste management operation.
Storage of Non-Recyclable Waste and Recyclable Waste	There is a separate waste storage area for each block. All waste storage areas have adequate space to accommodate weekly storage of bins for dry mixed recyclable, glass, organic waste and mixed non-recyclable waste.	Easily accessible by all residents, tenants, facilities management personnel and the waste contractor(s), minimises potential littering of the scheme, reduce potential waste charges and does not limit waste contractor selection.
	Domestic waste management strategy: All dry mixed recyclable, glass, mixed non-recyclable waste and organic waste segregation.	Helps reduce potential waste charges and does not limit waste contractor selection.
	Security restricted waste storage rooms.	Reduce potential for fly tipping by residents, tenants and the public.
	Well signed waste storage rooms and waste receptacles.	Help reduce potential cross contamination of waste and reduce waste charges.

2.4 Health and Wellbeing

Measure	Description	Benefit
Natural Daylight	The buildings have been orientated to optimize natural daylight/sunlight to the proposed apartments and amenity spaces.	Good daylighting levels reduce the need for artificial lighting thereby reducing costs. Greater light levels also contribute to the livability and amenity enjoyed by residents.
Security	The scheme has been designed to incorporate passive surveillance with the following security strategies likely to be adopted: <ul style="list-style-type: none"> • Secure bicycle stands – covered by CCTV • Routine access fob audits • Controlled access points between private and public amenity areas (podiums) 	A robust security strategy, reduces potential security/management costs, lessens anti-social behavior and enhances the safety for residents.
Accessibility	All units, including access and egress, will comply with the requirements of Part M/K	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
Natural Amenity	Private open space is located at podium levels. All the external ground floor landscape will be accessible to the residents and the public.	The quality and quantity communal amenity spaces facilitates community interaction, socialising and play – resulting in improved wellbeing.

2.5 Management

Consideration has been given to the ensuring the homeowners have a clear understanding of their property.

Measure	Description	Benefit
Home User Guide	<p>Once a tenant moves into the property they will be provided with;</p> <ul style="list-style-type: none"> • Home User Manual – this will provide important information for the tenant on details of their property. It typically includes details of the property such as MPRN and GPRN, information in relation to utility connections/communication providers, contact details for all relevant suppliers, and user instructions for appliances and devices in the property. • A Residents Pack - prepared by the OMC which will typically provide information on contact details for the managing agent, emergency contact information, transport links in the area, and a clear set of rules and regulations. 	<p>These clear lines of communication, information and prompt management of issues will over time result in a better development quality and longevity, for these apartments and townhouses</p>

2.6 Transport

Measure	Description	Benefit
Access to Public Transport (Bus Services)	There are currently no bus services directly serving the development site. However, Castle Street will provide the required 'Bus Priority' road infrastructure as identified in CPS Map 4.6 to facilitate bus services both within and outside the development site. This proposed development also allows for the future delivery of the bus gate via the proposed western bridge connectivity to the Transport Interchange at Carrickmines Luas Station.	The future bus services will provide access to a range of destinations. The proximity, frequency and range of additional destinations served by these local bus services will enhance the accessibility levels of the proposed residential development in addition to providing a viable and practical sustainable alternative to journeys undertaken by the private motor car.
Access to Public Transport (Train Services)	The Carrickmines Luas Station is nearby and within 10 minutes walking distance of the village centre. Pedestrian/Cyclist access via the bridge over Carrickmines is provided within the development proposals. The proposed Brennanstown Luas station is near and when this proposed station is fully developed and open will provide another Luas station within approximately 10 minutes walking distance of the village centre.	The Carrickmines and Brennanstown Luas stations provide access to a range of destinations via the Luas Green Line enhancing the accessibility levels of the proposed residential development in addition to providing a viable and practical sustainable alternative to journeys undertaken by the private motor car.
Permeable Connections	Provision and subsequent maintenance of dedicated pedestrian and cycle infrastructure on-site, and their connectivity with adjoining public and third-party lands and the off-site networks, providing convenient access to local services including shops, schools, restaurants and doctor's surgeries. The development delivers the required pedestrian and cyclist permeability throughout the site extents in accordance with the aspirations of the CPS.	Ensure the long-term attractiveness of walking and cycling to a range of local education, retail and community facilities/services.
Bicycle Storage	The provision of high-quality secure bicycle parking facilities, for both short term and long-term parking requirement.	Accommodates the uptake of cycling and reducing the reliance on the private motor vehicle.
Motorcycle Parking	The implementation of secure, attractive, best practice motorcycle parking facilities for residents. The number of motorcycle parking spaces provided will be in accordance with the relevant standards of a minimum of four or more spaces per 100 car parking spaces (ref: CPS Section 4.2.11) as outlined in the Traffic and Transport Assessment.	Reduces the reliance on the private motor vehicle in parallel with reducing oil dependency.
E-car Facilities	Electric car charging will be provided within the development	To accommodate the growing demand for E-car which assist in decarbonising society and reducing oil dependency.

Section 3

Sustainability & Energy Report Mechanical & Electrical

BY
FALLON



**MECHANICAL & ELECTRICAL DESIGN STRATEGY,
ENERGY, SUSTAINABILITY & PART L COMPLIANCE**

**PRIORSLAND VILLAGE CENTRE & RESIDENTIAL
DEVELOPMENT**

**Project: 1830
Issue: Planning
Rev: F
Date: 04th April 2022**

Contents:

1.	Introduction	4
2.	Development Description.....	4
3.	Design Approach	5
5.	Cherrywood Planning Scheme Document Compliance Matrix.....	6
6.	Dun Laoghaire Rathdown County Development Plan 2016 – 2022 Policy Compliance Matrix ...	7
7.	Houses: Heating & Hot Water Solution.....	8
	7.1 Space Heating	8
	7.2 Mechanical Heat Recovery Ventilation (MVHR)	8
8.	Apartments – Mechanical Solution	9
	8.1 Exhaust Air Heat Pump (EAHP) & Mechanical Extract Ventilation (MEV).....	9
	8.2 Element 51 – Heating Centre	9
	8.2.1 Element 56 – Space Heating	10
	8.2.2 Element 57 – Ventilation	10
	8.3 Landlord Circulation & Common Areas.....	10
	8.4 Part L PBER Compliance - Apartment: Exhaust Air Heat Pump & PV.....	10
	Fig 8.4a: Draft PBER – Apartment.....	11
9.	Car Park Ventilation	12
10.	Electric Vehicle (EV):	13
11.	Summary.....	14

Project Details:

Project: Priorsland Village Centre and Residential Development,
Carrickmines,
Co. Dublin.

Client: 1 Carrickmines Limited

Architect: MOLA Architects
2 Donnybrook Rd,
Dublin 4.

Engineer: Punch Consulting Ltd
Carnegie House,
Dun Laoghaire.

Planning Consultant: Mc Gill Planning Ltd
45 Herbert Lane,
Dublin 2

M&E Consultant: Fallon Design Ltd.
Suite 4, No. 4 Riverwalk,
Arklow,
Co. Wicklow

Document Details:

Version	Title	Author
Rev F	Mechanical & Electrical Design Strategy	Fallon Design Ltd

Distribution Details:

Name	Issue Date	Revision
Design Team	14.11.18	A
Design Team	29.03.19	B
Planning	25.05.21	C
Design Team	16.07.21	D
Design Team	15.03.22	E
Design Team	04.04.22	F

1. Introduction

This design strategy, energy, sustainability and compliance report was prepared to accompany the planning application for the proposed development at Priorsland, Cherrywood, Co. Dublin. This report will outline the proposed mechanical and electrical solutions to ensure an efficient and sustainable solution for the Priorsland Village Centre & Residential Development as part of the Cherrywood Strategic Development Zone (SDZ) planning scheme.

This report aims to show how the proposed Priorsland development will comply with the relevant legislation for each building and its surroundings. These policies including the following:

- European Performance of Buildings Directive (EPBD)
- Irish Regulations (Specifically TGD Part L (2011))
- Dun Laoghaire / Rathdown County Plan 2016-2022
- Cherrywood Planning Scheme Document

In addition to the policies above, the most suitable Mechanical & Electrical (M&E) solution for the development must meet several other criteria in the current climate;

- Meet the comfort needs of the residents and end users of the development.
- Achieve compliance with policies including the latest Part L NZEB regulations and an A2 Building Energy Rating (BER)
- Be an efficient and sustainable heating & hot water solution for the residents.
- Ensure buildability and construction detailing that can be delivered in accordance with the building's envelope and internal fabric.
- Ensure a quality product for the end user and resident for the life of the development.

2. Development Description

The development will comprise a mixed-use village centre and residential development of 443 no. units comprising 6 no. blocks (A-F) of apartments (up to 5 storeys with basement/undercroft parking) providing 402 no. apartments units (146 no. 1-beds; 218 no. 2-beds and 38 no. 3-beds), and 41 no. houses (19 no. 3-beds and 22 no. 4-beds). All apartments provided with private balconies/terraces. Provision of indoor residential facilities to serve apartment residents.

The Village Centre and non-residential elements will comprise a supermarket, local retail/retail service units, non-retail commercial units, creche, gym, community space, and offices (High Intensity Employment) use.

Provision of car/bicycle/motorcycle parking; ESB sub-stations; bin storages areas, and all associated plant areas.

Provision of the first phase of Priorsland Park (on lands within the applicant's ownership) and other public and communal open spaces.

Construction of Castle Street through the subject lands and two road bridges across the Carrickmines Stream, one to serve the future school site/ park, the second to provide pedestrian and cyclist access to the Carrickmines Luas station and future Transport Interchange to the north. Provision of an additional pedestrian bridge to the park. Provision of an acoustic barrier along the southern/western edge of the site.

All associated site development works, landscaping, boundary treatments and services provision.

3. Design Approach

Fallon Design has taken a holistic approach to meeting the energy needs of the proposed Priorsland development and has considered the particular planning scheme objective / requirements as set out in the relevant standards and policies. We have considered the latest systems and technologies for the M&E strategy in both the houses and apartments that can achieve compliance with future Part L 2020 and meet the needs of the development's future residents.

Following the Lean-Clean-Green Energy Hierarchy, the first stage of carbon emission reduction is through the design of "fabric first" i.e. achieving a reduction in the energy needed, the second stage is sustainable generation of the actual energy required. The final stage is to introduce energy from renewable sources.



Lean – Use less Energy - Use of energy efficient building fabric, good air tightness levels and reduced thermal bridging

Clean – Use of energy efficient heating and hot water system, as well as efficient ventilation system

Green – Renewable Energy Integration

The passive approach of "fabric first" has been adopted in terms of maximizing the thermal efficiencies of the building envelope to reduce the required thermal load before a heating system is considered. In addition to careful selection of the high performance building fabric, specifically insulation materials, regulation of the air infiltration will serve to reduce the heat load of the buildings.

Other sustainable design elements to be included during detailed design are

- High performance glazing to harness solar gains
- Energy efficient heating systems to minimise running costs while also reducing carbon emissions.
- Heat recovery on ventilation systems
- High efficiency low watt DC motors
- Energy efficient lighting
- A-rated white goods
- Water efficient fittings to reduce water consumption

5. Cherrywood Planning Scheme Document Compliance Matrix

The following matrix confirms conceptual design compliance with the objectives contained within the Cherrywood Planning Scheme Document – Chapter 4 “Energy”.

Chapter 4.4	Objective	Conceptual Design Considerations	Met
PI 27	<p>Within this framework it is an objective to encourage locally generated renewable and low emission energy to supply a proportion of Cherrywood’s energy demand. This could include a range of energy options such as district biomass, solar thermal collectors, ground thermal energy storage, and integrated energy/heating systems such as Combined Heat and Power (CHP) at development area, neighbourhood and/or block scales, and the possible establishment of one or more Energy Service Companies (ESCO).</p>	<p>The amount of electricity locally produced using Photovoltaic (PV) in Priorsland will be determined by the latest edition of Part L of the building regulations. All renewable contributions as required in Part L to achieve compliance will be adhered to for landlord and circulation spaces.</p> <p>Central Plant heating with a biomass installation has been considered and deemed not the most suitable solution for this development. The primary reason is there is no large anchor tenant with a stable commercial load in the development. Priorsland is predominately an apartment residential scheme with a village centre of light retail and commercial units, i.e. there is no Hotel Spa & Leisure centre to generate a base load for a biomass plantroom incorporating a wood storage and delivery facility.</p> <p>Exhaust Air Heat Pumps (EAHP) have been selected for the developments energy centre in the apartments as opposed to a centralized Combined Heat and Power plant (CHP). The actual heating demand in NZEB A rated apartments is comparatively very low and hot water is the largest thermal load.</p> <p>No Energy Service Company (ESCO) is required for EAHP’s as each individual residential unit benefits directly from low heating demand and moderate hot water consumption on their own ESB utility bill.</p>	Y
PI 28	<p>It is an objective to comply with all the objectives of the current County Development Plan in relation to energy.</p>	<p>The use of electrification in residential heating is seen as an important contributor to replacing fossil fuels and moving to a low-carbon model. This achieves the County Developments plans for reducing the carbon footprint of the development.</p>	Y
PI 29	<p>It is an objective to embrace new and innovative technologies in this field, and to support their provision within the Planning Scheme.</p>	<p>This report shall outline the advantageous of an innovative technology called Exhaust Air Heat Pumps (EAHP) used across Europe for many years and have come to the fore in Ireland.</p>	Y

Chapter 4.4	Objective	Conceptual Design Considerations	Met
PI 30	It is an objective to support technologies and end-user behaviour to drive high levels of energy efficiency in end-uses.	Air source heat pumps have been proven to perform in Ireland delivering low energy costs. This technology is capable of achieving a high seasonal coefficient of performance (SCoP), typically between 3 & 5 depending on the system selection. These high levels of energy efficiency can be expected for the Priorsland development. Operating the heating system through the design of usable controls is a key element in delivering energy savings. The proposed design and the implementation of a practicable and usable interface for the end users is part of the design intent.	Y
PI 31	It is an objective to support and encourage sustainable energy initiatives.	Sustainability in housing design begins with reduction of the energy requirement by maximizing the buildings passive and active thermal performance. This sustainable design policy will be a key component of the detailed design process in Priorsland. Use of energy efficient M&E systems will also meet this objective.	Y

6. Dun Laoghaire Rathdown County Development Plan 2016 – 2022 Policy Compliance Matrix

The following matrix confirms conceptual design compliance with the relevant policies and objectives within the Dun Laoghaire Rathdown County Development Plan

Policy	Objective	Conceptual Design Considerations	Met
CC7: Energy Performance in New Buildings.	It is Council policy to promote and support new development that is low carbon development, is well adapted to the impacts of climate change and that energy conservation is considered and designed at the earliest stages through the use of energy efficiency management systems.	The Priorsland development has been detailed with a fabric first approach to reduce the carbon requirements from first principles. Reducing heat loss and maximizing glazing performance the built environment will generate a lower carbon foot print for its lifetime.	Y
Policy CC8: Excellence in the Built Environment.	It is Council policy to lead by example by developing a strategy for effective climate protection within its building stock.	The design and specification of high efficiency renewable technology inherently includes effective climate protection for buildings in Priorsland.	Y
Policy CC9: Sustainability in Adaptable Design.	It is Council policy to promote sustainable approaches to the improvement of standards for habitable accommodation, by allowing dwellings to be flexible, accessible and adaptable in their spatial layout and design.	The quality of the habitable accommodation has been delivered by the design team in Priorsland through the connections to the Luas, Linear Park and rich landscaping surrounding the built environment. This has been a key design focus for the development for the residents and users of the village centre.	Y

7. Houses: Heating & Hot Water Solution

The proposed heating solution for the houses in Priorsland shall use an air source heat pump due to their superior high efficiency hot water generation capacity. Under Part L the extraction of heat from the ambient outside air and released inside the building to both heat radiators as well as providing Domestic Hot Water (DHW) is considered a renewable technology, thus addressing both the clean & green elements of the energy hierarchy.

The outdoor unit shall be located discreetly in the landscaped rear gardens and mounted on a concrete plinth. As the outdoor units are fan assisted units, sensitivity in locating them is required so as not to disrupt any patio area with the cold air stream.

7.1 Space Heating

The houses will be heated with steel, horizontal panel radiators in each room and designed for the operating temperature of the air heat pump.

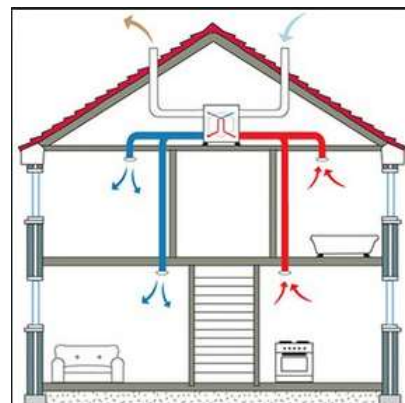
Each unit shall have two heating zones, the first zone will be the main open plan kitchen / living room and the second zone will be the bedrooms upstairs. Hot water will be on priority in all cases.

7.2 Mechanical Heat Recovery Ventilation (MVHR)

An independent system for mechanical ventilation will be used in the houses. The principle behind mechanical heat recovery ventilation is to continuously supply fresh air & extract stale air, so that the air in the house is changed around ten times per day. Air is supplied to living areas like bedrooms, the living room and extracted from service or wet rooms, i.e. bathrooms, kitchen and utility.

Schematic of typical MVHR System:

- Fresh air taken in at roof level
- Cold air warmed up by exhaust air
- Stale and moist air taken for WC's
- Warmed fresh air distributed
- Extract air discharged at roof level



8. Apartments – Mechanical Solution

8.1 Exhaust Air Heat Pump (EAHP) & Mechanical Extract Ventilation (MEV)

The heating and hot water strategy shall be used for the apartments in the development in accordance with current Part L of the building regulations and compliance demonstrated in accordance with SEAi requirements.

8.2 Element 51 – Heating Centre

The proposed heating and hot solution for the apartments shall be designed as an exhaust air heat pump. An Exhaust Air Heat Pump (EAHP), is an energy recycling system. It extracts energy from the warm air as it leaves the home via the ventilation system and uses it to heat the radiators and Domestic Hot Water (DHW).

The installation of an EAHP is self-contained within each apartment and only requires an ESB connection and standard mains water connection.

An exhaust air heat pump can satisfy the heating requirements of a well-insulated apartment in some of the coldest conditions. When working efficiently, it can reduce energy consumption of heating by up to 50% when compared to conventional heating systems.

If there is an extended period of cold weather the heat pump will call on a suitably sized back up heater to assist in meeting the apartments heating requirement.

The extracted air from the wet rooms is passed through the ducting into the heat pump. At this point, if there is a heat or hot water demand, the air passes through the heat pumps evaporator, which transfers the heat into the heat pump's refrigerant circuit.

The cooled air is then discharged from the unit and exhausted outside. Meanwhile, the vapour compression cycle of the heat pump raises the temperature of the refrigerant and transfers the extracted heat into a water-based system that can either heat the domestic hot water via a coil in an indirect cylinder or heat the building via radiators.

The EAHP is controlled with a touchscreen wall controller in each apartment with a phone app function as standard.

Typically, a local 250 litre hot water storage cylinder shall be located in a hot press of each apartment and meets the demands of the resident's hot water. An electric immersion shall be installed for boost and fast recovery of the cylinder if required.

8.2.1 Element 56 – Space Heating

The units will be heated with steel, horizontal panel radiators in each room of the units and designed for the operating temperature of the heat pump.

Each unit shall have two heating zones, the first zone will be the main open plan kitchen / living room and the second zone will be the bedrooms.

Heating control in the kitchen / living room will be with a 2-port valve and the room thermostat. Heating control in the master bedroom will be with a 2-port valve and thermostat. TRV's will control the space temperature in all other bedrooms.

8.2.2 Element 57 – Ventilation

The ventilation for the apartments shall be provided by the EAHP and be classed as mechanically ventilated. The central extract shall operate on the principle of mechanical extract ventilation (MEV).

MEV will be commissioned with two dedicated extract flow rates for the unit, one for background ventilation and one for boost ventilation.

- The background ventilation rate will be maintained 24/7 in order to ventilate the unit and maintain the heat pump operation volume flow rate.
- The boost ventilation will be activated by a drop-in air or water temperature and raise the volume flow rate to a maximum pre-set value.
- Passive wall inlet vents are required in all habitual rooms.

8.3 Landlord Circulation & Common Areas

The Part L compliance for the landlord circulation and amenity areas shall be satisfied with small Photovoltage (PV) panels as required locally to each stair core to meet the renewable contribution and reduce the lift and common area running costs.

8.4 Part L PBER Compliance - Apartment: Exhaust Air Heat Pump & PV

A provisional apartment BER has been included to demonstrate how exhaust air heat pumps can achieve NZEB Part L compliance in a typical 2-bed unit within the Priorsland development. See Fig 8.4a below.

Fig 8.4a: Draft PBER – Apartment

Priorsland Apartment : Provisional Part L Compliance Review - DRAFT

Exhaust Air To Water Heat Pump and MEV Ventilation

Apartment Type 1 - Provisional BER - A2 NZEB Compliant (Draft Part L: Compliance)

Exhaust Air to Water Heat Pump Space heating & Hot Water
Cylinder heat loss 1.15 kWh/day
Mechanical Extract Ventilation
Radiator System
Time and temperature zone control.
A rated central heating pump
Secondary heating system: N/A
Photovoltaic (PV): N/A

Results: Pass
EPC: 0.28 - (Control 0.3)
CPC: 0.237 - (Control 0.35)
Renewable Energy Ratio - 0.43 - (Control 0.2)

Notes:
The above fabric assumptions have been made to show compliance with an exhaust air heat pump installation.

One apartment has been assessed for the purpose of this exercise, the worst case and a full analysis on all types in all orientations will be completed at detailed design stage

REV:	A	Feb 2019	1830
------	---	----------	------

Proposed Fabric	U Value	Details
-----------------	---------	---------

Apartment Type: 80 m² / 2 Bed

1	Floors	N/A	200mm EPS Graphite insulation Thermal Conductivity 0.031
2	Roofs	0.15	150mm Rigid Insulation Thermal Conductivity 0.022
3	Sloped Roof	N/A	N/A
4	Block Walls	0.16	Thermal Conductivity 0.018 or equivalent
5	Doors	1.2	TBC
6	Windows - Double Glazed	1.2	Windows TBC with solar transmittance of 0.73.
7	Thermal Bridge Factor	0.08	
8	Air Leakage	3m ³ /hr/m ²	0.15ach
9	Thermal Mass	High	

9. Car Park Ventilation

The design of the basement and podium level car park ventilation will be a mix of both natural and mechanical ventilation. The developments car park design is a balance between achieving the required louvre area for naturally ventilated car parks and the quality of the public amenity circulation spaces with the high level of landscaping.

Mechanical Ventilation:

The basement carpark under blocks A & B is mechanically ventilated achieving both 6 air changes (ach) for normal operation and 10 ach in fire conditions. The overriding factor for selecting a mechanical ventilation system was to limit louvre area at podium level. Louvre areas required to allow a naturally ventilated carpark were deemed too restrictive and would compromise an unacceptable proportion of the usable public village centre.

An amount of mixed mode ventilation openings has been incorporated into the Blocks A & B podium level to reduce the running cost of basement extract fans. These openings have been designed into public seating and do not impact the usability of the public space.

The basement mechanical ventilation shall be designed as a pulse fan system with one extract plantroom and one supply air plantroom. The long linear rectangle shape of the basement car park makes an efficient ventilation system reducing the amount and dead spots and irregular shaped corners.

Natural Ventilation:

The basement under block C is naturally ventilated achieving the required opening area in accordance with the building regulations. The open louvre area has been carefully integrated into the landscape design to reduce the impact on the quality of the public amenity space.

The podium car park in block E & block F are also naturally ventilated achieving the required opening area in accordance with the building regulations.

10. Electric Vehicle (EV):

With introduction of new guidelines from the Irish government and the growing demand for alternative sources of fuel, the public's need for EV charging options is ever increasing in popularity. The following allowance will be included in the development for EV charging.

EV charging shall be provided in Priorsland in accordance with the Dun Laoghaire County Council Development Plan 2016 – 2022. The number of EV points shall be as per 8.2.4.12 Electrically Operated Vehicles;

Houses:

Each house shall be pre-wired for EV to allow the home owner to install a car charging point to the front or side of their house easily. The 6.0 mm² cable and location shall be suitably selected and positioned relevant to their private car parking spaces.

Apartments:

Total apartment number across the scheme 404; 40 EV spaces to be provided; on the basis of the 1 per 10 residential units ratio described in the current DLRCC Development plan.

Public Spaces / Non-residential:

Total retail + Non residential parking 120 spaces provided; 12 EV spaces to be provided; on the basis of the 1 per 10 car parking spaces ratio described in the current DLRCC development plan.

11. Summary

The Priorsland design team have implemented a holistic fabric first approach for a sustainable and energy efficient development for its owners and occupants into the future.

The following is a summary of the proposed Mechanical and Electrical proposed heating, ventilation and hot water solutions for the Priorsland development:

- Houses:
 - o Air Source Heat Pumps with
 - o Mechanical Heat Recovery Ventilation (MVHR)

- Apartments:
 - o Exhaust Air Heat Pump with integral Mechanical Extract Ventilation (MEV)

This report confirms compliance with the energy & sustainability sections of the Cherrywood Planning scheme and the Dun Laoghaire Rathdown County Development Plan 2016 – 2022.

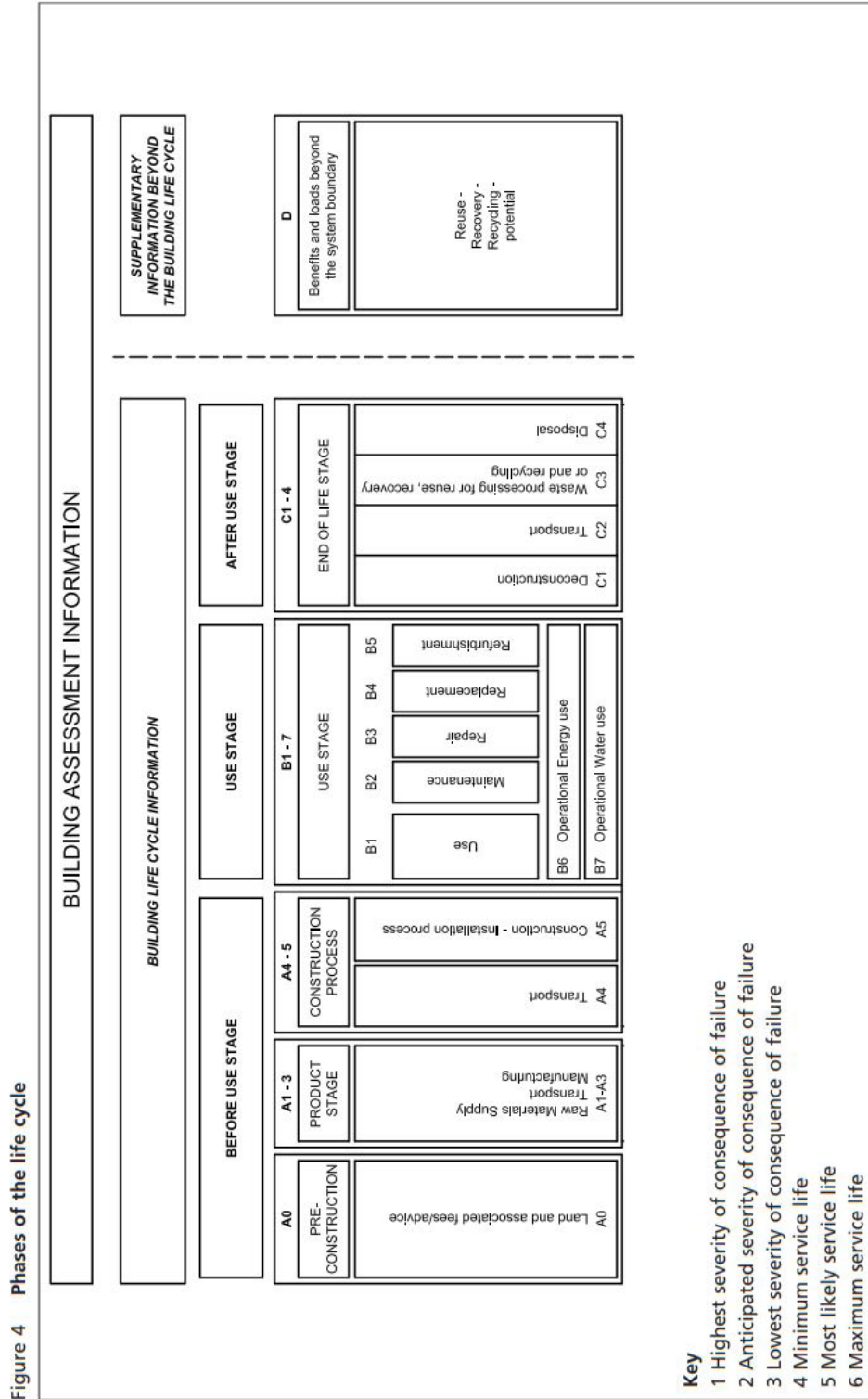
The draft provisional Apartment BER in section 8.4 demonstrates compliance with Part L technical guidance document with a calculated Energy Performance Coefficient (EPC) less than the Maximum Permitted Energy Performance Coefficient (MPEPC) of 0.3 and a calculated Carbon Performance Coefficient (CPC) of less than the Maximum Permitted Carbon Performance Coefficient (MPCPC) of 0.35.

The passive approach of “fabric first” has been adopted in terms of maximizing the thermal efficiencies of the building envelope to reduce the required thermal heat load required internally by the residents.

Sustainable use of the energy required to satisfy thermal loads has been considered and renewable sources selected. This approach will guide the development from planning through to detailed design to satisfy the high standards of Nearly Zero Energy Buildings.

Appendix A

Phases of the Life Cycle of BS7543; 2015



MOLA

Architecture

mail@mola.ie

+353 1 218 3900

2 Donnybrook Road, Dublin, D04 NN50

www.mola.ie