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SUSTAINABILITY & ENERGY STATEMENT

FOR

PORTMARNOCK SOUTH PHASE 1D DEVELOPMENT

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CONTENT

1. INTRODUCTION

The purpose of this report is to outline and also to confirm that the dwellings in the development will be built in compliance with NZEB requirements as per the new Part L Dwellings (2019). The compliance is assessed using the upgraded Domestic Energy Assessment Procedure (DEAP Version 4.2.1)

The proposed development (Phase 1D), generally comprises: -

- 172no. residential units consisting of 22no. duplexs and 150no. houses ranging in heights between 1.5 and 3 storeys.
- Provision of public open space including Skylark Park and extension to Railway Linear Park and Townland Boundary Linear Park.
- Vehicular access to serve the development is proposed off the existing / under construction access points on roads serving the St. Marnock's Bay development.
- A new vehicular road is proposed to serve the proposed development which will connect with Moyne Road. The permanent road includes the provision of a new junction with Moyne Road and SuDS features to control surface water run-off.
- Upgrade of existing temporary foul water pumping station and storage tank to increase capacity.
- All associated and ancillary site development, infrastructural, landscaping and boundary treatment works.

The location of the proposed development close to public transport routes will ensure good connectivity. The Development is in walking distance to the Portmarnock train station and Bus Routes serving the area.

2. EXECUTIVE SUMMARY

The proposed development is a continuation of the St Marnock's Bay project and together with its density and layout, will promote the efficient use of land and of energy. It location in relation to public transport and cycling routes will also reduce greenhouse gas emissions.

The residential units in the development shall be constructed to achieve a high level of thermal efficiency with highly insulated building fabric and optimising passive solar gains. Our design employs that all dwellings will have a very high energy performance & amount of energy required will be covered by high efficiency heat pumps.

Our in-depth analysis and design modelling of the development will show that the most suitable system employs high efficiency heat pumps for each dwelling serving both heating and hot water.

3. BUILDING REGULATIONS

PART L & NEARLY ZERO-ENERGY BUILDING

The new part L (2019) of building regulations was issued in draft format for public consultation and is yet to be finalised. Once released this document shall be the new standard for dwelling constructed after October 2019.

The Part L 2019 set building fabric and energy performance to achieve Nearly Zero-Energy Building.

Nearly Zero-Energy Building (NZEB): means a building that has a very high energy performance as determined in accordance with Annex I of the EU Energy Performance of Buildings Directive Recast (EPBD Recast). The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

The Part L 2019 introduces Renewable Energy Ratio (RER) is the ratio of the primary energy from renewable energy sources to total primary energy as defined and calculated in DEAP. This is replacing Part L 2011 Renewable contribution.

EPC & CPC

In order to achieve the acceptable primary energy consumption rate for a nearly zero energy dwelling, the calculated energy performance coefficient (EPC) of the dwelling being assessed should be no greater than the Maximum Permitted Energy Performance Coefficient (MPEPC). The MPEPC for a nearly zero energy dwelling is 0.30.
To demonstrate that an acceptable CO2 emission rate has been achieved for a nearly zero energy dwelling, the calculated carbon performance coefficient (CPC) of the dwelling being assessed should be no greater than the Maximum Permitted Carbon Performance Coefficient (MPCPC). The MPCPC for a nearly zero energy dwelling is 0.35.

4. SUSTAINABILITY & ENERGY STATEMENT

The location of the proposed development close to public transport routes will ensure good connectivity. Its location in walking distance to the Portmarnock train station and Bus Routes serving the area.

To reduce energy demand of the dwellings will be constructed with high standard of insulation & air tightness. Additional energy demand reduction will be achieved by applying passive design techniques. The design of the fabric and proposed equipment will satisfy the requirements of new Part L Building Regulations and NZEB.

The specification of individual building elements, building services and items linked to energy efficiency was reviewed in detail for the typical dwelling types occurring throughout the development to ensure compliance with the building regulations and requirements of the local council.

Key Sustainable Design Elements:

- High performance triple glass in the windows.
- High levels of insulation
- A+ Low energy LED lighting throughout the development.
- High levels of air-tightness of the dwellings.
- Demand controlled ventilation for each dwelling.
- High efficiency heat pump for each unit serving heating & hot water requirements

WINDOWS AND BUILDING FABRIC

All windows shall be double glazed windows with a combined thermal transmittance not greater than 1.4W/m2K. All windows shall comply with BS EN ISO 10077-1: 2006 - 'Thermal performance of windows, doors and shutters. Calculation of thermal transmittance'
Building fabric will include insulation levels sufficient to meet the Part L 2019 U-values.

Table 1. Building Elements U-values

Building Fabric Element	Target U values	Part L 2019 Maximum Elemental U-value
Exposed & Ground floor	0.12 W/m²K	0.18 W/m²K
External Wall	0.18 W/m²K	0.18 W/m²K
Pitched Roof	0.14 W/m²K	0.16 W/m²K
Flat Roof	0.2 W/m²K	0.2 W/m²K
External Windows & Doors	1.4 W/m²K	1.4 W/m²K

THERMAL BRIDGING ACCEPTABLE CONSTRUCTION DETAILS

Building Regulations TGD L Appendix D is defining thermal bridges that occur at junctions between building elements and are included in the calculation of transmission heat losses. The DEAP calculation includes thermal bridging, at junctions between elements and around openings.

For purpose of this statement and preliminary BER results a value of y = 0.08 W/m2K was used. Value 0.08 W/m2K may be used for new dwellings whose details conform with "Limiting Thermal Bridging and Air Infiltration – Acceptable Construction Details" as referenced in Building Regulations 2011 TGD L. This requires that the details described in the above document are adhered to and relevant drawings be signed off by the site engineer or architect.

AIR PERMEABILITY

Part L (2019) specify 5 m3/m2/hr @ 50Pa as upper limit for air permeability and also that every house needs to be tested. To reduce heat loss by infiltration the target air permeability will be 3.0 m3/m2/hr @ 50Pa

Air permeability shall be measured by means of pressure testing of a building prior to completion in accordance with BS EN ISO 9972:2015 'Thermal performance of buildings. Determination of air permeability of buildings. Fan pressurization method '

HEATING & HOT WATER

Use of low carbon technology includes High Efficiency Split System Air Source Heat Pumps. This unit and key sustainable measures will satisfy the Renewable Energy Ratio.

The heat pump type should be a single phase All-in-One Combination type Air Source Heat Pump. This is a split (bi-bloc) type system with an external fan unit and internal unit with integrated stainless steel domestic hot water cylinder. The heat pump should be fully compliant with Eco-Design Labelling Directive, both EN14825 and EN16147.

High level of controls and multiple zones will also aid to more efficient usage of the system and further reduce the energy demand. For the new DEAP assessment detailed design for hot water fittings will be carried out.

Booster pump and all heating pump shall have energy rating class A.

DEMAND CONTROLLED VENTILATION

Part F of building regulations requires adequate and effective means of ventilation shall be provided for people in buildings. This shall be achieved by:

(a) limiting the moisture content of the air within the building so that it does not contribute to condensation and mould growth, and
(b) limiting the concentration of harmful pollutants in the air within the building.

It is proposed that Demand controlled ventilation (DCV) system will serve each unit to provide high indoor air quality for the occupants. Max SPF of the fan should not be higher than 0.25 W/l/s and has to be listed on the SAP Appendix Q database.

The design of dwellings shall provide required area of background ventilators via wall vents/trickle vents & undercut doors to wet rooms to provide fresh air in place of extracted air from the wet rooms. Systems should be installed, balanced and commissioned by competent installers eg Quality and Qualifications Ireland accredited or Education Training Board or equivalent. Systems when commissioned and balanced should then be validated to ensure that they achieve the design flow rates by an independent competent person eg NSAI certified or equivalent.

ENERGY SAVING LIGHTING

The new DEAP requires a detailed design of lighting for each dwelling. For this project the calculation of lighting use shall based on the installed fixed lighting, and on the contribution of daylight. The calculation will include low-energy lighting provided by fixed outlets based on lighting design details (e.g. lamp power and efficacy), lamp type, and number of lamps.