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SUSTAINABILITY & ENERGY STATEMENT

FOR

PROPOSED RESIDENTIAL DEVELOPMENT

AT

CLONATTIN ROAD, GOREY, Co. WEXFORD

FOR

AXIS CONSTRUCTION

Project Reference:	J616
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1. INTRODUCTION

The purpose of this report is to outline and to confirm that the dwellings in the development will be built in compliance with NZEB requirements as per the new Part L Dwellings (2019)

Axis Construction, intends to apply to An Bord Pleanála for permission for a strategic housing development on an approximate site area of 15.7ha, located to the South of Clonattin Village in the townland of Clonattin Upper, Gorey Bridge, Gorey, Co. Wexford. To the north of the site is the Clonattin Village residential estate, to the west is The Hillcrest Drive residential estate, with open lands to the east and south. The proposed development will consist of 363 new homes alongside sustainable commercial interests, community, and educational spaces.

The proposed development provides for all associated site development works, including the provision of footways, footpaths to facilitate pedestrian movement within and through the scheme and to provide easy and convenient access to facilities and services adjacent to the scheme, 6 no. ESB unit sub-stations, car parking, bin & bicycle storage, public open spaces, hard and soft landscaping, boundary treatments and public lighting. Access to the development will be via a series of new vehicular entrances off Clonattin Village Road and Courtown Road (R742) to the south.

2. EXECUTIVE SUMMARY

The proposed development with its density and layout, will promote the efficient use of land and of energy. Its 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 apartments 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 apartment serving both heating and hot water.

Commercial units will have building fabric U value levels in compliance with Part L 2017 (Other than Dwelling) and shall be fitted as shell and core only. Future tenant will be obliged to fit out M&E system to comply with Part L.

3. BUILDING REGULATIONS

PART L & NEARLY ZERO-ENERGY BUILDING

The Part L (2019) shall be the standard for construction of new dwellings (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

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 Gorey train station and Bus Routes serving the area.

To reduce energy demand, the dwellings will be constructed with a 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 specifications 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 airtightness 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 triple glazed windows with a combined thermal transmittance not greater than 1.0W/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, 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 along with PV panels 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 (bibloc) 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.

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 must 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 e.g. NSAI certified or equivalent.

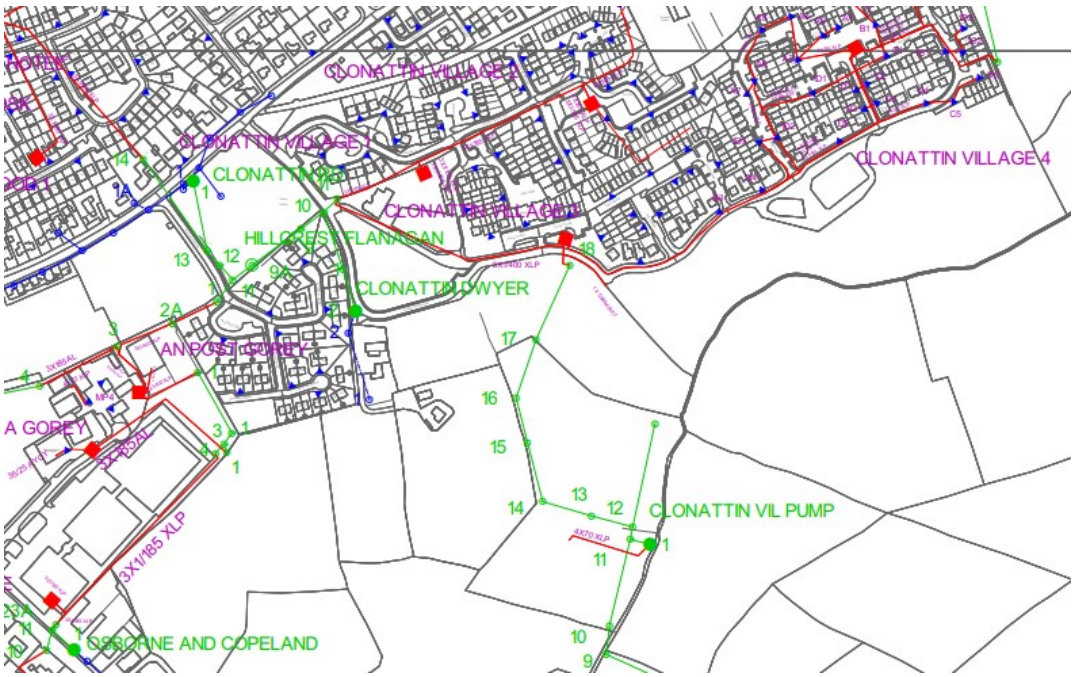
5. INFRASTRUCTURE

The proposed site location is very well serviced by all major utilities. Major spine services for Electricity, Water and Communications have local network sufficient to meet the needs of the new development. Based on the number of dwelling units/ Childcare Facility and possible Educational building. it is envisaged that 6 no. ESB substation shall serve the development.

We have explored utilities which are in immediate proximity to the site & reviewed specific service diversions, service routes and capacities to the site.

Proposed site

Existing EIR Infrastructure



Existing ESB Infrastructure

Existing Virgin Media Infrastructure

We have engaged with all Utility Service Providers (ESB/EIR/Virgin Media) to ensure there is enough capacity to serve the development. All have advised that the current infrastructures can be adopted to suit the proposed development. Based on the number of residential commercial units and the provision of Future Educational Facility, the services layouts now include locations of 6 no. ESB unit type substations to meet the anticipated electrical demand. This information was also forwarded to the local ESB office for clarification and acceptance (in principal).