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24020-PL-ES

ENERGY STATEMENT

PROPOSED AMENDMENTS TO SHD DEVELOPMENT

AT GRANGE END, DUNSHAUGHLIN, COUNTY MEATH

Applicant: Loughglynn Developments Ltd.

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1.0 Introduction

This document provides as overview of the development energy strategy and relates to the sustainability and energy targets proposed for the project. The development must approach the energy design in an efficient manner that reduces energy demand initially through passive strategies such as an effective envelope which in turn reduces the energy demands relating to items such as the heating system. This initial approach in reducing the energy demand significantly aids the project on obtaining the required energy goals. Performance criteria relating to the development's envelope are set out in the following document.

The energy systems design must also focus on specifying energy efficient equipment to ensure the day to day running of the energy systems are optimised to further enhance energy savings and the related energy cost. Specifications relating to efficient heating, lighting and auxiliary equipment are set out in this document.

The report sets out to demonstrate a number of methodologies in Energy Efficiency, Conservation and Renewable Technologies that will be employed in part or in combination with each other for this development. These techniques will be employed to achieve compliance with the building regulations Part L and NZEB standards currently in public consultation.

2.0 Proposed Development

This report relates to a proposed amendment to an approved SHD development that is under constructions on site at Grange End, Dunshaughlin, Co. Meath. The proposed Large Scale Residential Development (LRD) will consist of amendments to the Strategic Housing Development (SHD) permitted on site under Ref. ABP-307244-20 for 211 no. residential units (112 no. two storey houses and 99 no. apartments in 6 no. blocks), creche and associated works. This amendment application seeks to omit permitted apartment Blocks D and E (comprising 36 no. units) and replace with 15 no. 3 bed houses, resulting in a revised residential development of 190 units in total. Omission of permitted access road from the permitted Distributor Road to the east and associated amendments to residential car parking and provision of additional open spaces. All other site works including boundary treatments, landscaping and site services to facilitate development. The remainder of the development to be carried out in accordance with the parent permission Ref. ABP-307244-20.

3.0 Building Energy Rating

As of 2006 all domestic buildings that were newly built and existing buildings that are for sale or rent require a BER (Building Energy Rating) certificate. The actual building energy rating is based on the primary energy used for one year and is classified on a scale of A1 to G with A1 being the most energy efficient. It also gives the anticipated carbon emissions for a year's occupation based on the type of fuel that the systems use. In order to identify Primary energy consumption of the building, the BER assesses energy consumed under the following headings:

- Building type (house, apartment etc.)
- Building orientation
- Thermal envelope (insulation levels of the façade, roofs, ground floor etc.)
- Air Permeability (how much air infiltrates into the building thorough the façade)

- Heating systems (what type of heat source is used and how efficient)
- Ventilation (what form of ventilation is used. Natural vent, mixed mode mechanical ventilation)
- Fan and pump efficiency (how efficient are the pumps and fans)
- Domestic hot water generation (is a high efficiency heating method used)
- Lighting systems (how efficient is the lighting in the building)

Through the specification of an energy efficient façade and HVAC systems the energy consumption of the building will be reduced compared to a set baseline. This ensures the environmental and economic impact of the operation of the building is reduced. The key philosophy of this plan is to reduce energy consumption by firstly limiting the energy needed by improving the buildings insulation. The second step is to utilise energy in the most efficient way through the selection and insulation of energy efficient plant and equipment. The final step is to introduce energy from renewable sources to reduce the burden on Fossil Fuels.

4.0 Structure and Building Elements

While the construction works will incur an initial investment, the lifetime running cost of the building must be considered to reduce water, fuel and electrical energy consumption. To that end methods will be explored to further improve the building's energy rating and reduce the carbon emissions. This includes decreasing the thermal conductivity (heat losses) of the building fabric, take advantage of passive solar gain to reduce the heating demand in the space and increase day lighting to reduce artificial lighting. Natural ventilation may be employed or if deemed as a requirement mechanical ventilation and / or heat recovery techniques will be employed to recover energy in the exhausted air.

The following are some outline u-value specifications which will achieve the required energy specifications:

4.1 Fabric "U" Values Dwelling Houses

- Ground Floor Slab - 0.18 $W/m^2.K$
- Walls - 0.18 $W/m^2.K$
- Windows - 1.3 $W/m^2.K$ (solar fraction (g factor) of 0.7, frame factor of 0.7 or better)
- Doors - 1.4 $W/m^2.K$ (This is to include Frame)
- Roof - 0.16 $W/m^2.K$
- Thermal Bridging - Factor of 0.08 using "Acceptable Construction Details"

4.2 Air Permeability (Air Tightness against infiltration)

One of the most significant heat loss factors in any buildings is through controlled and uncontrolled ventilation through the introduction of ambient/outside air into the heated space. Both the proposed dwellings and apartments are to be constructed with a high degree of air tightness to a possible value of $3m^3/m^2/hr$ or 0.15 Air Changes with a permeability test conducted post construction to demonstrate this level in accordance with the TGD's.

4.3 Secondary Heat Source

The dwellings will not contain a secondary heat source therefore this is not applicable.

5.0 Building Services (M&E) Overview

5.1 Heating & Ventilation Systems Dwellings

The only heating option under consideration for the dwelling units is an air source heat pump. Air source heat pumps utilise low grade heat from external ambient air and transfer heat to heating system pipework. These systems operate with very high efficiencies (>400%) which provides significant carbon reductions in comparison to a traditional boiler system.

5.2 Lighting

All lighting to be energy efficient with provision made for low energy lamps such as Compact Fluorescent Lamps (CFLs) which are 80% less electricity and last up to 10 times longer than ordinary light bulbs in the dwellings.

6.0 Summary Part L Compliance Example Specifications

Table 1: Summary of Part L compliance for typical dwelling house

U-Values	[W/m^2.K]
Floor [Max, Part L 2019 =0.18]	0.17 Floor to have minimum 100mm PIR
Roof [Max, Part L 2019] = 0.16 Insulation on Ceiling/rafter	0.12 Pitched roof with insulation to be minimum 300 mm earth wool
Wall [Max, Part L 2019 = 0.18]	0.18 Wall insulation to comprise 120mm Ecobead with PIR thermal liner fixed to internal leaf
Door [Max, Part L 2019=1.4]	1.4
Windows [Max AV, Part L 2019 = 1.4], solar factor 0.73	1.3 Windows to have minimum solar factor of 0.71
Mechanical plant Heating source	Air to water Heat Pump
Heating controls	Time and temperature control of heating hot water with individual heating zones.
Heat emitters	Oversized radiators with mean water temperature 42.5 Deg C
Hot water cylinder	200 litre cylinder
Ventilation	Centralised ducted extract system serving heat pump. Specific fan power 0.33 W/Ls minimum
Additional requirements.	
Lighting	100% energy efficient lighting
Air permeability	@ 3 m^3/hr/m^2

Thermal bridging	Factor of 0.08, junction details to conform with "Limiting Thermal Bridging and Air Infiltration – Acceptable Construction Details"
Secondary Heating	N/A
BER Results	25-49 (A2)
EPC [MPEPC = 0.3]	>0.3
CPC [MPCPC = 0.35]	>0.35
Renewable contribution [RER]	>0.2