KERRIGAN CONSULTING

Climate Action Statement

Proposed Residential Development at Kilnahue & Gorey Hill, Carnew Road & Kilnahue Lane, Gorey, Co. Wexford

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1-0 INTRODUCTION

This report by Kerrigan Consulting highlights how the overall energy and sustainability strategy for the proposed Large-Scale Residential Development (LRD) in Gorey, Co. Wexford will be addressed within the design in order to achieve compliance with Technical Guidance Document (TGD) Part L – Conservation of Fuel and Energy - Dwellings 2022.

With the current emphasis placed on energy conservation and the use of Low and Zero Carbon (LZC) technologies, the applicant is keen to enhance the development's sustainability credentials. The overall energy strategy for the building has been developed holistically utilising the energy hierarchy "Be Lean, Be Clean, Be Green".

The proposed design follows a "fabric first" approach, which will reduce the energy demand in the dwellings through energy efficient building envelopes and low air permeability, which will reduce the energy demand of the heating systems. The building envelope of the dwellings will be designed to ensure that its thermal performance will exceed that of TGD Part L 2022 and is detailed in the report.

High efficiency lighting, heating and ventilation systems shall be carefully selected to reduce running costs and energy use.

LZC technologies will be incorporated into the design, as deemed appropriate, as part of an integrated services strategy, as opposed to a 'bolt-on' approach.

The energy performance of each dwelling will be assessed during the detailed design stage, in accordance with the Dwelling Energy Assessment Procedure (DEAP) methodology to demonstrate compliance with TGD Part L 2022.

2-0 PROPOSED DEVELOPMENT

The proposed Large Scale Residential Development (LRD) includes the construction of 413 no. residential units, a creche, and all associated site development works.

The proposed residential units include a varied mix of detached and semi-detached houses, townhouses, and apartments/duplexes. In addition to this mix of unit types, the units will provide a mix of 1 bed, 2 bed, 3 bed, and 4 bed homes.

A full description is provided in Chapter 2 of the EIAR and in the statutory notices.

3-0 ENERGY EFFICIENCY OF BUILDINGS

The proposed design will follow a "fabric first" approach, with the aim of minimising energy demand through good envelope design. This approach will be further enhanced by the selection of energy efficient services.

This approach offers genuine long-term energy savings by reducing the inherent energy demand of the dwellings in the first instance. These benefits are described and quantified as follows:

3-1 BUILDING DESIGN – ENERGY EFFICIENCY

The general construction design standards to be adopted must exceed the requirements of Technical Guidance Document (TGD) Part L of the Building Regulations - Dwellings (2022 Edition). As mentioned previously, the building design will follow to the "Be Lean, Be Clean, Be Green" philosophy. The first stage of the design s "Be Lean", where the building fabric was improved over and above the requirements of TGD Part L 2022. The services strategy for the dwellings will be developed following the "Be Clean" philosophy, ensuring that the lighting, heating and ventilation designs are as effective as possible. Renewable energies will then be considered as part of the "Be Green" philosophy.

3-2 BE LEAN

The building envelopes will be designed to ensure that the fabric and form of the proposed dwellings encompasses the low energy sustainability strategy, with U-values equal, or better than those stated in Table 1 of TGD Part L 2022. Please refer to table below for details of the proposed u-values. Please note that the final u-values may vary, but will comply with TGD Part L.

In accordance with the requirements of low energy buildings, the air tightness characteristics will also be addressed. With robust design, the target proposed for the dwellings is $3m^3/m^2/hr$ @ 50Pa.

Element	Target U-values			
	TGD Part L 2022 Backstop	House	Ground Floor Apartment/ Maisonette	Mid & Top Floor Duplex/ Maisonette
	(W/m^2K)	(W/m^2K)	(W/m^2K)	(W/m^2K)
Ground/ Exposed Floor	0.18	0.15	0.16	N/A
Roof - Flat	0.20	N/A	N/A	0.20
Roof - Pitched	0.18	0.12	N/A	0.12
External Wall	0.18	0.14	0.16	0.16
External Door	1.4	1.4	1.4	1.4
Glazing	1.4	1.4	1.4	1.4
Air Permeability	Maximum $3m^3/m^2$/hour @ 50Pa			
Thermal Bridging Factor	0.08			

3-3 BE CLEAN

The design will incorporate high efficiency LED lighting, heating and ventilation systems shall carefully selected to reduce running costs. Refer to Section 4-0 for further details.

3-4 BE GREEN

Renewable energy systems will then be considered in the form of solar photovoltaic (PV) panels. PV panels will be provided, as required to ensure all dwelling achieve compliance with TGD Part L 2022.

3-4-1 BUILDING ENERGY RATING (BER)

Preliminary BER certificates shall be produced for each main dwelling type prior to lodgement of commencement

4-0 ENERGY STRATEGY

4-1 HEATING AND DOMESTIC HOT WATER SYSTEMS

The heating and domestic hot water strategy will be finalised during the detailed design stage. At the moment there are 2 systems under consideration heat pumps, serving radiators and a hot water cylinder, or electric panel heaters/ infrared radiant panels and hot water cylinder with electric immersion.

4-2 AIR TO WATER HEAT PUMP (AWHP)

As part of the sustainable energy strategy for the proposed development, each house and two-storey duplex will be equipped with a high-efficiency air-to-water heat pump system. The selected solution is a mono-bloc unit, which integrates all refrigeration components within the external condenser. This design eliminates the need for refrigerant pipework inside the dwelling, enhancing safety and simplifying installation.

From the externally mounted condenser, pre-insulated flow and return pipework will supply heat to radiators and the domestic hot water cylinder, typically located in the hot press.

Air-to-water heat pumps extract low-grade heat from the ambient air and transfer it to the heating system. These systems operate with seasonal efficiencies exceeding 400%, offering substantial reductions in carbon emissions compared to conventional gas or oil boilers.

The efficiency of the proposed heat pump system is expected to meet the majority—if not all—of the renewable energy contribution required under Part L of the Building Regulations. This will enable compliance with the minimum 20% Renewable Energy Ratio (RER) for new dwellings with minimal or no additional renewable technologies.

Heating Controls and Zoning

- Each dwelling will feature a fully zoned heating system, divided into ground floor, first floor, and domestic hot water zones.
- Each zone will be independently controlled via a central time clock with separate time and temperature settings.
- Thermostatic radiator valves (TRVs) will be installed on all radiators and towel rails in rooms without a dedicated temperature sensor.

All domestic hot water and heating pipework within the dwellings will be constructed using pre-insulated multilayer piping to minimize heat loss.

A recirculating cooker canopy will be installed in each kitchen to meet ventilation requirements without compromising building airtightness.

4-3 EXHAUST AIR HEAT PUMP (EAHP)

The proposed heating solution for ground floor apartments and maisonettes is an Exhaust Air Heat Pump (EAHP) system. This technology operates similarly to air-to-water heat pumps but uses stale extract air from kitchens and bathrooms as its heat source, eliminating the need for an external condenser unit.

The EAHP system provides both space heating and domestic hot water. Units will be located in the utility room or hot press, typically positioned above the hot water cylinder. Heat is recovered from internal air extracted via ducts from wet rooms (kitchen, bathrooms, utility), and the cooled exhaust air is discharged externally. Internal gains from lighting, occupants, and appliances are also captured, enhancing overall efficiency.

These systems are particularly well-suited to compact, airtight, low-energy or passive-standard dwellings. With seasonal efficiencies exceeding 400%, EAHPs offer substantial carbon savings compared to traditional boiler systems.

The high efficiency of the EAHP system is expected to meet most or all of the renewable energy contribution required under Part L of the Building Regulations. This will support compliance with the 20% Renewable Energy Ratio (RER) for new dwellings with minimal or no additional renewable technologies.

Heating Controls and Zoning

- Each dwelling will feature a fully zoned heating system, and domestic hot water zones.
- Each zone will be independently controlled via a central time clock with separate time and temperature settings.
- Thermostatic radiator valves (TRVs) will be installed on all radiators and towel rails in rooms without a dedicated temperature sensor.

Ductwork will be installed using flat rigid profiles (200×60 mm or 220×90 mm), with insulated exhaust ducts between the EAHP and external louvre.

All domestic water and heating pipework will be constructed using pre-insulated multilayer piping.

A recirculating cooker canopy will be installed in each kitchen to maintain airtightness and meet ventilation requirements.

4-4 ELECTRIC HEATING

As part of the sustainable energy strategy and avoiding the use of fossil fuels, each dwelling will be equipped with a combination of high-efficiency infrared radiant panels and electric panel heaters to provide the heating and a hot water immersion providing domestic hot water. The system would be supplemented with PV panels on

the roof and designed to incorporate battery storage. This design eliminates the need for refrigerant pipework, heating pipework and standard radiators inside the dwelling, enhancing safety and simplifying installation.

The PV panels will offset a substantial proportion of the heating and hot water energy consumption, and the installation of battery storage will reduce the peak electrical demand from the ESB grid. The battery storage can also be charged up overnight, at a reduced electricity tariff, for use during the day, further reducing electricity bills to the homeowners.

Heating Controls and Zoning

- Each dwelling will feature a fully zoned heating system, with each room an individual zone and separate domestic hot water zone, all controllable by web-based app.

All domestic hot water pipework within the dwellings will be constructed using pre-insulated multilayer piping to minimize heat loss.

A recirculating cooker canopy will be installed in each kitchen to meet ventilation requirements without compromising building airtightness.

4-5 MECHANICAL VENTILATION SYSTEMS

The mechanical ventilation system shall be selected in conjunction with the heating systems to ensure that the proposed dwellings comply with TGD Part F and Part L.

4-5-1 CENTRALISED CONTINUOUS MECHANICAL EXTRACT VENTILATION (CMEV)

Centralized mechanical extract ventilation (CMEV) includes the provision of a single continuously operating extract fan unit per dwelling (typically installed in the attic), which connects to extract grilles within each kitchen, utility and bathroom. The extract fan unit operates continuously to provide constant background extract ventilation and boosts when the bathrooms are used.

General background ventilation is provided via closeable wall ventilators.

The bedroom, lounge and dining areas are naturally ventilated via the wall vents and opening windows.

4-5-2 *EXHAUST AIR HEAT PUMP* (EAHP)

The ventilation side of the EAHP operates in a similar way to a CMEV, with a continuously operating fan extracting stale air from extract grilles within each kitchen, utility and bathroom. The extract fan unit operates continuously to provide constant background extract ventilation and boosts when the bathrooms are used or to suit the heat pump's requirements.

General background ventilation is provided via closeable wall ventilators.

The bedroom, lounge and dining areas are naturally ventilated via the wall vents and opening windows.

4-6 LIGHTING INSTALLATION

High efficiency LED lighting shall be installed throughout the development.

4-7 RENEWABLE ENERGY

As described above, heat pumps shall be installed in all dwellings, providing heating and domestic hot water, while also contributing towards the dwelling's renewable energy requirements.

In dwellings where the heat pump's renewable energy contribution is less than required to achieve a renewable energy ratio (RER) of 0.2, as calculated by the DEAP software, solar photovoltaic (PV) panels will be installed on the roof of the dwelling to ensure compliance with TGD Part L 2022.

4-8 SOLAR PHOTOVOLTAIC PANELS

Solar photovoltaic (PV) panels are best suited to sites which have an unobstructed southerly and south-easterly elevations. PV is particularly suitable due where there is a simultaneous requirement for heating, hot water and electrical demand. The on-site generation of electricity can supplement the electrical requirement for lighting, motors, etc & reduce the electrical demand and from the grid.

Where heat pumps are installed, PV panels will generally not be installed, as the combination of heat pumps, high insulation levels, good air tightness and LED lighting should ensure all dwellings achieve full compliance with TGD Part L 2022. The roofs will however be designed to enable PV panels to be installed in the future.

Where electric heating is installed, PV will be required.

4-9 SUMMARY

	House/ 2 Storey Duplex	Ground Floor Apartment/ Maisonette
Heating Source	Air to Water Heat Pump (AWHP)/ Electric Heaters	Exhaust Air Heat Pump (EAHP)/ Electric Heaters
Heating Controls	Time & temperature control of heating & hot water. 2no. heating zones (AWHP)/ local temperature control (electric heating).	Time & temperature control of heating & hot water. 1no. heating zone(AWHP)/ local temperature control (electric heating).
Heat Emitters	Radiators/ Electric Heaters	
Hot Water Storage	180 litre HWS cylinder.	
Ventilation	Centralised mechanical extract ventilation (CMEV). Fan located in attic.	Centralised mechanical extract ventilation as part of EAHP system/ CMEV.
Lighting	100% energy efficient LED lighting	
PV Panels	As required to comply with TGD Part L	
BER Results	A2	
EPC (MPEPC = 0.3)	<0.3	
CPC (MPCPC = 0.35)	<0.35	
RER (min = 0.20)	>0.2	

5-0 ELECTRIC VEHICLE CHARGING (EVCH) POINTS

Provision for the future installation of an electric vehicle charge point will be incorporated into the electrical design of each house.

It will not be possible to duct each carpark space back to individual dwellings, therefore communal type charging facilities, with a payment facility will be installed.

Please refer to EV Charging Strategy Report for additional information.

6-0 UTILITIES

Initial discussions have taken place with the ESB regarding existing infrastructure in the locality. The preliminary loading for the site is estimated to be in the region of 2,300 kVA. (subject to change depending on final renewable considerations, etc.). Preliminary design estimates would indicate 4no. 630kVA substations/ unit substations will be required.

There are also existing 10/ 20kV overhead ESB lines on the site, which will be diverted underground as part of the development.

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