BELTON
CONSULTING ENGINEERS

FORTLAWN INFILL SITES

FOR: FINGAL COUNTY COUNCIL

CLIMATE ACTION ENERGY STATEMENT

Revision:	For Planning
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	DIRECTOR
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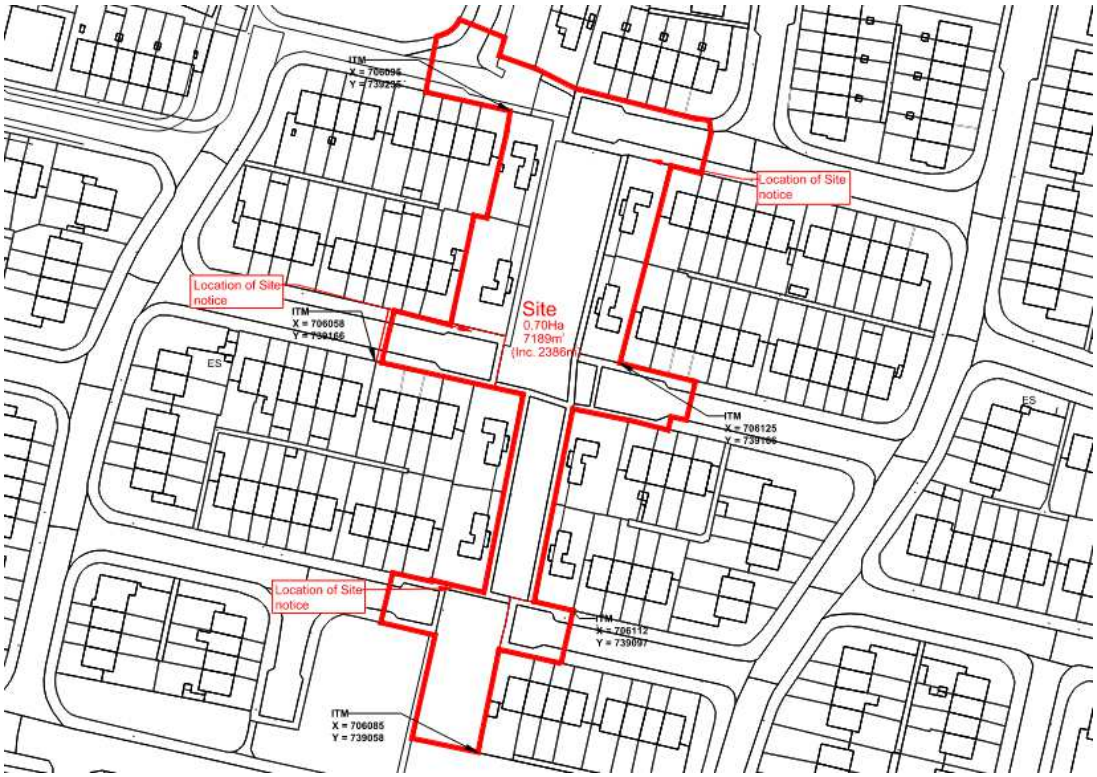

BELTON CONSULTING ENGINEERS

B17 Ballymount Corporate Park,
Ballymount Avenue,
DUBLIN 12.

PROJECT NO.: 2414

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1. INTRODUCTION

This climate action energy statement has been prepared in support of the planning application for the proposed Residential development at 23-257 Fortlawn Infill Sites, Clonsilla. The report outlines how the proposed development will meet or exceed the legislative and planning requirements for energy conservation and sustainability, in accordance with:

- Technical Guidance Document Part L – Conservation of Fuel and Energy for Dwellings
- Fingal Development Plan 2023-2029, Climate Action policy
    - CAP11 Climate Adaptation Actions in the Built Environment
    - CAP12 Climate Action Energy Statements
    - CAP13 Energy from Renewable Sources

Our approach to the task of energy conservation for the development is based upon the design philosophy ''Be Lean, Be Clean, Be Green'' philosophy, which aims to lower the demand for energy, to maximise the efficiency of energy transfer, and to use low-energy technologies.

Key design features for energy and sustainability includes enhanced building fabric insulation and air tightness levels, decentralised heat pumps providing heating, hot water, ventilation by exhaust air heat pumps or continuous mechanical extract or mechanical heat recovery ventilation, low energy lighting.

The proposed development will comply with the national building regulations for energy conservation and renewable energy requirements. All dwellings will achieve a minimum energy performance rating, (i.e. BER) A2.

The report is structured as follows:

- Legislative and planning requirements
- Energy Strategy Approach
- Energy and carbon reduction measures

2. DEVELOPMENT DESCRIPTION

The development is proposed at two infill sites at Fortlawn Avenue and Fortlawn Park, Blanchardstown, Dublin 15. The site to the North of the site is site A and the site to the South is site B. The proposed development will principally comprise of the demolition of 4 no. existing residential dwellings, and the construction of 21 no. new residential dwellings across the two sites.

The overall site area is 7189m² (0.72Ha) with a net development area of (0.48Ha). Site A is generally bound by: Residential boundary walls to the east and west; Cul-de-sacs on Fortlawn Park and Avenue to the north; Cul-de-sacs on Fortlawn Park and Avenue, and public open space to the south. Site B is generally, bound by: Residential boundary walls to the east; Cul-de-sacs on Fortlawn Park and Avenue, and public open space to the north; Public open space to the west and south.

The two sites include: 6 no. cul-de-sacs and parts of the roads on Fortlawn Park and Fortlawn Avenue for alterations to the road and footpath layouts, the green open space centrally located between site A and site B, mains water, foul and surface water connection works.

The proposed works on Site A comprise of: Demolition of 4 no. detached, 3-bedroom, two-storey houses at no.'s 23A and 46A Fortlawn Avenue, and no.'s 63A & 81A Fortlawn Park, Blanchardstown, D15; Construction of 7 no terraced houses in one block comprising 1 no. 4-bedroom house (1 & 2-storeys)and 6 no. 3-bedroom houses (2-storeys) and associated boundary treatments, private open space, hard & soft landscaping, paved driveways, and bin and bicycle storage to mid-terrace units; Construction of 12 no. apartments in one block (2-storeys) comprising 6 no. 1-bedroom apartments (3 no. to each floor) and 6 no. 2-bedroom apartments (3 no. to each floor), with 3 no. shared entrances, stairs and plant areas, terraces and balconies and associated boundary treatments, communal open space with hard & soft landscaping (250m²), communal waste bin

storage, communal and visitor bicycle storage, hard & soft landscaping to building perimeter, off street parking for 12 no. vehicles (incl. 2 no. disabled bays and 2 no. EV charging bays) and 2 no. motorcycle parking bays.

The proposed works on Site B comprise of: Construction of 2 no semi-detached houses,1 no. 4-bedroom house (1 & 2-storeys) and 1 no. 3-bedroom house (2-storeys) and associated boundary treatments, private open space, hard & soft landscaping, and paved driveways.

The development will also include the following: Demolition of 6 no. cul-de-sacs on Fortlawn Park and Fortlawn Avenue; New roads and pedestrian footpaths to provide access to Site A and Site B, linking Fortlawn Park and Fortlawn Avenue in 3 no. locations with associated works including speed ramps, raised table pedestrian crossings, public lighting, street trees, hard & soft landscaping, improvements to existing open space creating areas of incidental play; and all associated site development, water, drainage and utility connection works, above and below ground.

3. LEGISLATIVE AND PLANNING REQUIREMENTS

The proposed scheme is subject to the requirements of national and local planning policy and the strategy is dictated and developed in accordance with these policies.

3.1. EU ENERGY POLICY: ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (EPBD)

The EPBD requires countries to gradually increase energy efficiency requirements for buildings, leading to requirements for near zero energy buildings in 2020. These requirements are introduced in national building codes in the EU countries including Ireland. The Directive was adopted in 2010 and was revised in 2018 and 2024.

The main elements of the EPBD, Directive 2010/31/EU, are as follows**:**

- Energy efficiency requirements should be set to cost-optimal levels.
- Energy efficiency requirements shall be gradually increased to reach "near zero energy houses" for all new buildings in 2020 and for public buildings in 2018.
- Countries shall set energy efficiency requirements for technical building systems, such as heating systems, ventilation, windows, and other building envelope parts, condensing boilers, high-efficiency heat pumps, low-energy windows, and energy efficient ventilation.
- With major renovations of buildings, the renovated parts of the building shall be energy efficient, also when renovating small buildings.
- Renewable energy and district heating shall be used when it is cost-effective.
- Buildings shall be certified regarding energy efficiency when sold, and for larger buildings at regular intervals.

3.2. IMPLEMENTATION OF THE REVISED EPBD (2018/844/EU)

Amendments to Part L of the Building Regulations (relating to the conservation of fuel and energy in dwellings) give effect to the *European Union (Energy Performance of Buildings) Regulations 2019*, published on 03 May 2019 (S.I. 183 of 2019). The regulations came into effect on 01 November 2019. The regulations transpose Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings (recast) as amended by Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018.

The Directive sets requirements for Member States to improve the energy performance of buildings and make an important contribution to the reduction of greenhouse gas emissions. A revised Technical Guidance Document, L (Conservation of Fuel and Energy) Dwellings has been published to accompany the Regulations.

The Directive defines a Nearly Zero Energy Building (NZEB) as a building that has a very high energy performance. It states that 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.

Article 9(1) of the Directive requires Member States to ensure that by 31 December 2020, all new buildings are nearly zero energy buildings. Under the previous 2011 regulations, a typical new dwelling is built to an A3 Building Energy Rating (BER). The NZEB requirements will equate to an A2 BER. This represents a 70% improvement in energy efficiency and a 70% reduction in CO2 emissions compared to 2005. It also introduces 20% renewables as a percentage of the total building energy use.

3.3. CURRENT BUILDING REGULATIONS

The Building Regulations set out requirements for specific aspects of building design and construction. The requirements concerning conservation of fuel and energy are laid out in Technical Guidance Document Part L.

3.4. TECHNICAL GUIDANCE DOCUMENT PART L 2022 (DWELLINGS)

The aim of Part L is to limit the use of fossil fuel energy and related CO2 emissions arising from the operation of buildings, while ensuring that occupants can achieve adequate levels of lighting and thermal comfort. The key issues to be addressed to ensure compliance are as follows.

1. Limitation of primary energy use and CO2 emissions
2. Building fabric standards
3. Building services standards
4. The use of renewable energy sources

3.4.1. LIMITATION OF PRIMARY ENERGY USE AND CO_2 EMISSIONS

Primary energy use and the associated carbon dioxide emissions are calculated using the Dwelling Energy Assessment Procedure (DEAP) and these parameters must not exceed specified target values.

To achieve compliance with primary energy use rate for NZEB the energy performance coefficient (EPC) of a dwelling must be no greater than the Maximum Permitted Energy Performance Coefficient (MPEPC), which is 0.30.

An acceptable carbon dioxide emissions rate for NZEB is achieved if the calculated carbon performance coefficient (CPC) is no greater than the Maximum Permitted Carbon Performance Coefficient (MPCPC), which is 0.35.

Where a building contains more than one dwelling, every individual dwelling or alternative, the average of the dwellings within the development's Energy and Carbon performance coefficients should not exceed the maximum permitted coefficients.

3.5. BUILDING FABRIC STANDARDS

3.5.1. LIMITING OF HEAT LOSS

Best practice fabric U-values and air tightness standards will be implemented to minimise heat flow/loss through the building envelope. Detailed calculations will be undertaken to assist in determining the appropriate envelope build-up, including the type, thickness, and location of thermal insulation. The amount, type and location of glazing will be optimised to achieve an optimal balance between daylight quality and heat gains and losses.

3.5.2. PASSIVE SOLAR SHADING

To ensure that the building does not overheat, particularly in areas where there are higher levels of glazing and internal gains, adequate means of limiting summertime temperatures will be implemented. External shading in the form of window reveals and overhangs, and solar performance glazing will be incorporated into the façade design to assist in the reduction of overheating.

3.5.3. PASSIVE SOLAR HEAT GAIN

Sunlight will be used where possible to reduce the need for heating on cold days. This resource will be harnessed by allowing sunlight to enter the buildings to areas with high thermal mass such as exposed concrete.

3.5.4. NATURAL DAYLIGHT

The design will seek to maximise the use of natural daylight through the development in order to reduce energy consumption from artificial lighting. This will be achieved through an integrated approach utilising a combination of building form, light wells, glazing systems and day-light responsive control systems.

Building Regulations Part L outlines the acceptable levels of provisions necessary to ensure that heat loss through the fabric of a building is minimised. The technical document discusses various aspects, including:

- Insulation levels to be achieved by the plane fabric elements.
- Thermal bridging.
- Limitations of air permeability.

The maximum permitted area-weighted U-values in Part L 2022 are as follows:

- Pitched Roof 0.16
- Flat Roof 0.20
- Walls 0.18
- Ground Floors 0.18
- Other Exposed Floors 0.18
- External Personnel Doors, Windows and Rooflights 1.4

The maximum area-weighted U-Values may be relaxed for individual elements where necessary for design or construction reasons, (e.g., dormer cheek) but the maximum elemental U-Values still applies. Additional insulation will be required in the same elements to ensure that the maximum area-weighted averages are met. Heat losses due to thermal bridging are considered in the DEAP calculation and thus in the calculation of the EPC, CPC and RER.

Part L requires an air permeability level no greater than $5m^3/h/m^2$ at 50 Pascals.

3.6. BUILDING SERVICES STANDARDS

Part L sets out minimum requirements for space heating, water heating, and ventilation services and associated controls in new dwellings.

3.6.1. SPACE HEATING

Space heating via decentralised air to water heat pumps or exhaust air heat pumps within each dwelling subject to detail design is currently being proposed for the dwellings. To meet compliance with the renewable energy requirements set out in Part L, a heat pump with the appropriate seasonal efficiency for space and water heating will be selected.

3.6.2. DOMESTIC HOT WATER

Domestic hot water is currently proposed by the local heat pump unit within the dwelling.

3.6.3. MECHANICAL VENTILATION

The following mechanical ventilation systems shall be considered for the development to maintain indoor air quality for the apartments and houses.

- Whole-house demand control mechanical ventilation with heat recovery.

3.6.4. ARTIFICIAL LIGHTING (INTERIOR AND EXTERIOR)

Energy-efficient lighting will be implemented throughout the development to achieve the appropriate light levels, as recommended by CIBSE. The design of lighting systems shall ensure that lighting is only used when required, and only the specific areas where lighting is needed.

3.7. RENEWABLE ENERGY TECHNOLOGIES

New dwellings are required to install renewable energy systems to comply with the Renewable Energy Provision. Renewable energy technologies are solar thermal systems, solar photovoltaic systems, biomass systems, biofuel systems, heat pumps, wind power generators and other similar small-scale systems.

Where the EPC ≤ 0.30 and the CPC ≤ 0.35 the ratio of primary energy from renewable energy technologies to total primary energy use (known as the Renewable Energy Ratio, or RER) should be at least 0.20. An RER of 0.2 represents a 'significant level of energy provision from renewable energy technologies' in NZEB.

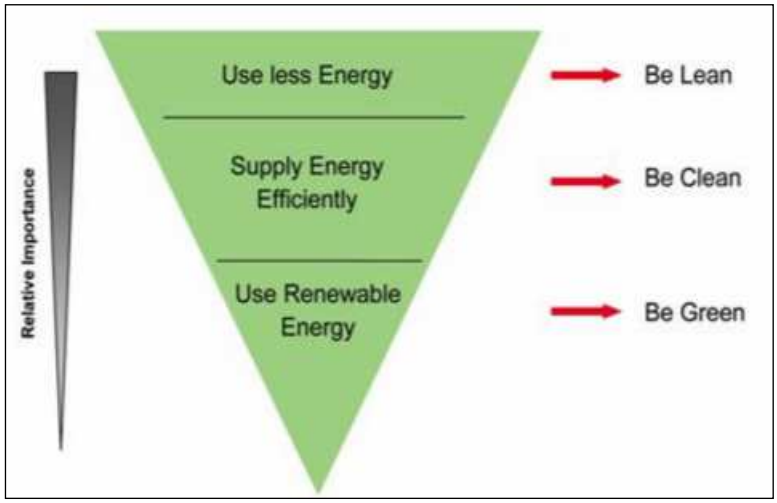
4. ENERGY STRATEGY APPROACH

The energy strategy for the development has been established by using the hierarchy of design considerations for reducing energy use.

The first step in the energy hierarchy is 'Be Lean', which looks to achieve high levels of energy performance through the design of the building fabric.

The second stage is 'Be Clean', which involves investigation of alternative energy supply and energy efficient building services systems.

The third stage is 'Be Green', which looks at the integration of low and zero carbon technologies as a means of further reducing emissions associated with the development. This approach is illustrated in the following diagram:



5. ENERGY AND CARBON REDUCTION MEASURES

5.1. CAP11 COMPLIANCE

The following NZEB technologies have been considered for this development, as listed below and which can be referenced to the requirements of CAP11:

- Decentralized Exhaust Air to Water heat pumps for space heating, domestic hot water and extract ventilation as per CAP11 parts b + e.
- Decentralized split air to water heat pump providing heating and domestic hot water with a separate ventilation system as per CAP11 parts b + e.
- Decentralized mono-bloc air to water heat pump providing heating and domestic hot water with a separate ventilation system as per CAP11 parts b + e.
- Photo voltaic system for on–site electricity use as per CAP11 e.
- Solar thermal for domestic hot water and/or space heating as per CAP11 part b + e.

- Mechanical ventilation with heat recovery as per CAP11 parts b + e.
- Continuous mechanical extract ventilation as per CAP11 part b.
- Natural ventilation with intermittent extract as per CAP11 parts b + e.

The energy balance for this housing development scheme means that a decentralised heat pump scheme would be the most practical option for meeting the renewable energy requirements. At the next stage of this design, we will review the requirement for the supplementary photovoltaics.

5.2. TGD PART L SPECIFICATION

The Part L and BER specification was detailed and developed in the Energy Analysis Report for the domestic units. An excerpt of the TGD Part L specification is outlined below in table 1. (following page)

Table 1: TDG Part L Specification

Requirements	Domestic	
	Proposed development	Part L 2022 Reference
Building Envelope U-values (W/m²K)		
Pitched Roof	0.14	0.16
Flat Roof	0.14	0.20
Above-Grade Wall	0.18	0.18
Ground-Contact Floor	0.12	0.18
Exposed Floor (where applicable)	0.12	0.18
Window/Curtainwall (glazing + frame)	1.4	1.4
Rooflight (glazing + frame)	-	1.4
External Door	1.0	1.4
Air Leakage		
Air-Leakage Rate (m^3/hr. m^2 @ 50 Pa)	3	5
Thermal Bridging		
Y Value Target (ACDs)	**ACDs 2022 Part L**	
Electrical		
Lamp Type	LED	-
Mechanical		
Space Heating System	EAHP / Monobloc	-
Space Cooling System	NA	-
Domestic Hot Water System	From space heating source	-
Renewables		
Solar PV	No requirement	-
Part L NZEB Compliance/Building Energy Rating		
EPC	Compliant	-
CPC	Compliant	-
RER	Compliant (met by EAHP)	-
Part L Compliance	Yes	-
BER	A2	-

6. PROPOSED PERFORMANCE

DEAP calculation for the domestic units based on the latest architectural, mechanical and electrical information for the residential units will be carried out at the next stage of the design.

The headings are specified as follows:

- EPC: Energy Performance Coefficient
- CPC: Carbon Performance Coefficient
- RER: Renewable Energy Ratio
- BER: Building Energy Rating

Domestic Apartment Units

Unit Type	Floor	Need to Comply with Part L 2022 (NZEB)			Need to Comply with Part L (Y/N)	BER to Achieve
		EPC	CPC	RER		
1 Bedroom Residential Unit	Ground Floor Unit	Y	Y	Y	Y	A2
2 Bedroom Residential Unit	First Floor Unit	Y	Y	Y	Y	A2
3 Bedroom Residential Unit	2 Storey House	Y	Y	Y	Y	A2
4 Bedroom Residential Unit	2 Storey House	Y	Y	Y	Y	A2

The proposed Fortlawn Infill Residential development will achieve TGD Part L 2022 compliance and A2 BER for residential units. DEAP calculations will be carried out at the next stage of the design.