169-177 Merrion Road Student Accommodation Climate Action Energy Statement

19.08.2024

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Site Address:
Gowan Motors Compound Site,
169-177 Merrion Road,
Dublin 4

Client:
1 Merrion Compound Land Limited

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Revision and Review

This report has been prepared for the sole benefit, use and information of the client. The liability of Tent Engineering with respect to the information contained in this report will not extend to any third party.

PURPOSE

P1	Information
P2	Coordination
P3	Planning
P4	Building Control
P5	Pre-tender
P6	Tender
P7	Construction

ACCEPTANCE (BY OTHERS)

S	Issued
A	Accepted
B	Accepted subject to comments
C	Rejected
D	Acceptance not required

Accepted by

REVISION(S)

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1 Introduction

This climate action energy statement has been prepared in support of the planning application for the proposed student accommodation at Gowan Motors Compound Site, 169-177 Merrion Road, Dublin 4. This development is planned to contain 200 student bedrooms within a multi-story development.

The report outlines how the proposed development will meet or exceed the legislative and planning requirements for energy conservation and sustainability, in accordance with the following:

- Dublin City Development Plan 2022-2028
- Part L-Conservation of Fuel and Energy in other buildings (2022)

Our approach to the task of energy conservation for the development is based upon the design philosophy “Be Lean, Be Clean, Be Green”, 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
- Centralized heating and hot water systems
- Low energy lighting with occupancy and daylight control where appropriate
- Supplementary photovoltaics to landlord areas

The proposed development will comply with the national building regulations for energy conservation and renewable energy requirements; Part L nZEB compliant.

The report is structured as follows:

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

2 Development Description

The proposed development at the Gowan Motors Compound Site, located at 169-177 Merrion Road, Dublin 4, involves the construction of a student accommodation facility. This multi-story development will encompass 200 student bedrooms, designed to provide comfortable and sustainable living spaces for students.

Key Features of the Development:

- The development will feature 200 student bedrooms, each thoughtfully designed to maximize comfort, privacy, and functionality.
- The layout includes clustered bedrooms, with communal living and study areas to foster a sense of community among residents.
- The building’s design adheres to the highest standards of energy conservation and sustainability, in line with the Dublin City Development Plan 2022-2028 and Part L of the Building Regulations.
- The building envelope will be constructed using materials and methods that meet and exceed the U-value requirements stipulated in the Technical Guidance Document Part L 2021.

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

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 incorporated into national building codes in EU countries, including Ireland. The Directive was adopted in 2010 and revised in 2018.

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. This includes 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, even for small buildings.
- Renewable energy and district heating shall be used when cost-effective.
- Buildings shall be certified regarding energy efficiency when sold, and larger buildings shall undergo certification 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.

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 2021 (Non-Domestic)

The aim of Part L is to limit the use of fossil fuel energy and related C02 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 CO_2 emissions

2. Building fabric standards

3. Building services standards

4. The use of renewable energy sources

3.5 Renewable Energy Technologies

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

To achieve NZEB compliance for primary energy use, the energy performance coefficient (EPC) of a building must be no greater than the Maximum Permitted Energy Performance Coefficient (MPEPC), which is 1.0.

An acceptable carbon dioxide emissions rate for NZEB compliance is achieved if the calculated carbon performance coefficient (CPC) is no greater than the Maximum Permitted Carbon Performance Coefficient (MPCPC), which is 1.15.

3.6 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 ≤ 1 and the CPC ≤ 1.15 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.

3.7 Building Fabric

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 2021 applicable to this are as follows:

- Flat Roof 0.20
- Walls 0.21
- Ground Floors 0.21
- Other Exposed Floors 0.21
- Curtain walling 1.8
- High usage entrance doors 3.0
- External Personnel Doors, Windows and Roof Lights 1.6

The maximum area-weighted U-Values may be relaxed for individual elements where necessary for design or construction reasons, 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 NEAP 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.

3.8 Building Services

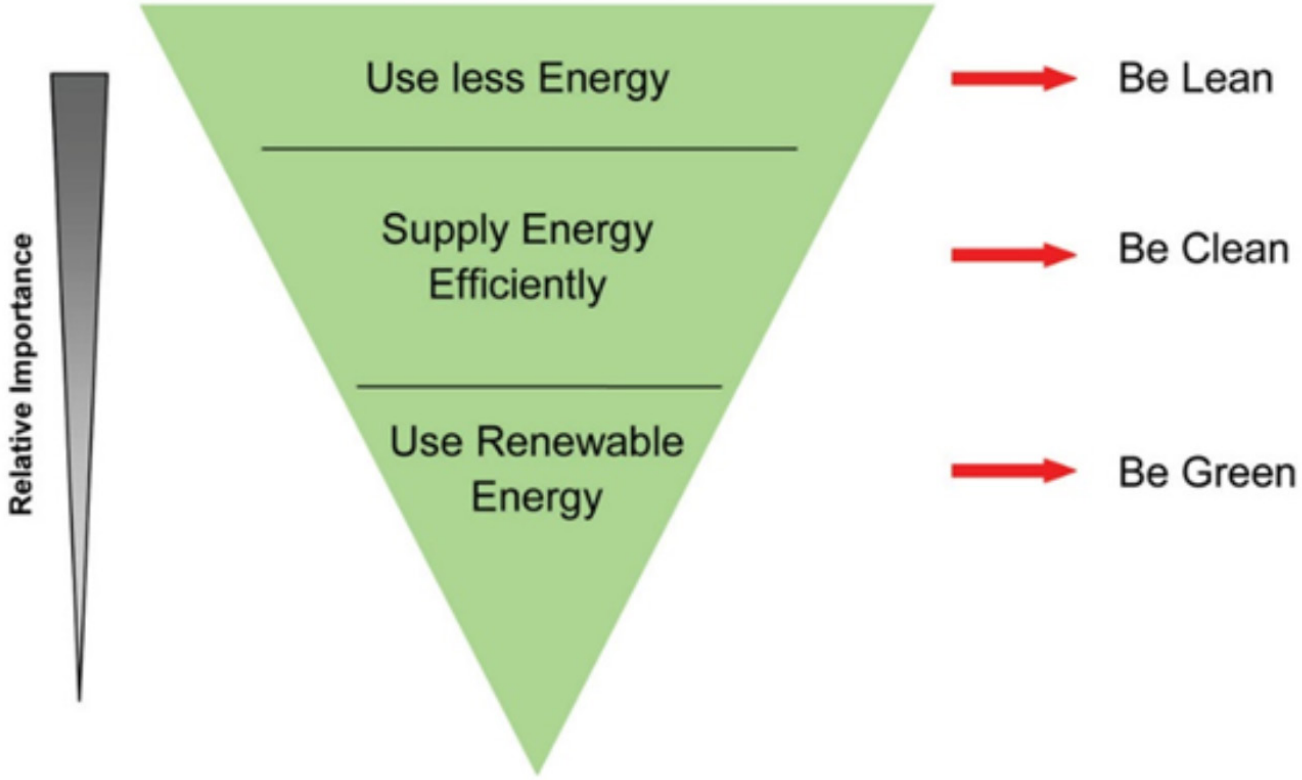
Part L sets out minimum requirements for space heating, water heating, and ventilation services and associated controls in new building.

4 Energy Strain 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 diagram:

Fig 4 - Energy Hierarchy, Building Research Establishment Enviromental Assessmnt Method (BREEAM)



5 Energy and Carbon Reduction Measures

This section outlines the targets we have to ensure the building constructed to a highly sustainable standard.

Part L and BER specification is outlined in table 5.1.

5.1 Building Fabric

To limit the heat loss through the façade, careful consideration must be shown when designing the external façade. The specification of the insulation utilised, and the continuity of insulation are crucial. Insulation slows the rate at which heat is lost or gained to the environment. Heat flows in three ways: by conduction, convection, and radiation.

Table 5.1 - TDG Part L Specification

Requirements	Non-Domestic	
	Base Design	Part L 2022 Re-ferance
Flat Roof	0.15	0.20
Above Grade Wall	0.15	0.21
Ground Contact Floor	0.15	0.21
Exposed Floor (where applicable)	0.15	0.21
Window/Curtailing (glazing + frame)	1.4	1.6
Rooflight (glazing + frame)	-	1.6
External Door	1.4	1.6
Air-Leaking Rate (m^3/hr. m^2 @ 50 Pa)	3	5
Y Value Target (ACDs)	ACDs 2022 Part L	
Lamp Type	LED	-
Space Heating System	To be decided based on outcome from most favourable renewable energy technology to meet part L compliance	-
Space Cooling System		-
Domestic Hot Water System		-
Solar PV		-
EPC	Compliant	1
CPC	Compliant	1.15
RER	Compliant	0.2
Part L Compliance	Yes	-

The tables below compare the TGD Part L maximum elemental U-values required for compliance and the proposed elemental U-values.

5.1.1 Air Permeability

One major contributing factor to unnecessary heat loss is infiltration. Infiltration is the air leakage of external air into a building due to the pressure difference associated with internal and external temperatures.

Under the Part L 2022 (NZEB), a performance level of 5 $m^3/hr/m^2$ @ 50Pa represents a reasonable upper limit for air permeability. It is intended that the proposed development will target an air permeability rate of 3 m^3 /hr/m^2 @50 Pa.

5.1.2 Thermal Bridging

Thermal bridges occur where the insulation layer is penetrated by a material with a relatively high thermal conductivity and at interfaces between building elements where there is a discontinuity in the insulation. Where an existing construction element to be retained shows a risk of thermal bridging, every effort will be made to reduce the risk by upgrading the façade to ensure continuity of insulation to limit local thermal bridging as much as practically possible.

5.2 Ventilation System

Ventilation will be performed using low energy methods:

- Student rooms will be designed for natural ventilation, where possible. Extract ventilation in toilet areas will be based on heat recovery systems to retain as much heat as possible when it is required.
- Amenities will be designed for mechanical ventilation with occupancy sensing to minimize the time for overrun.

5.3 Lighting

The electrical design will require that all lighting by LED with occupancy sensing where required.

5.4 Renewable Energy Ratio (RER)

The following NZEB technologies will be considered for this development:

- Centralized air to water heat pumps
- Photovoltaic system for on-site electricity use

6 District Heating

At the time of lodging the planning application there is no option for the connection into a local district heating system.

7 Conclusion

This proposed development will be designed to comply with all relevant environmental and sustainable regulations. Building design and analysis will be conducted in conjunction with all

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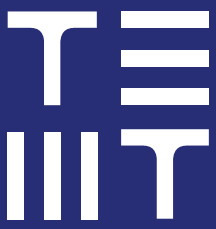

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