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**GOATSTOWN STUDENT ACCOMMODATION
ENERGY & SUSTAINABILITY STATEMENT**

REVISION 5

Project Number 19K113

March 2022

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1. INTRODUCTION

This document outlines Energy Impact of the new student accommodation development. The design of the building takes into account Technical Guidance Document L - Conservation of Fuel and Energy - Buildings other than Dwellings. The building shall be NZEB compliant. The energy performance of the building is such as to limit the calculated primary energy consumption and related Carbon Dioxide (CO₂) emissions to a Nearly Zero Energy Building level. Both energy consumption and Carbon Dioxide emissions for the development have been calculated using the Non-domestic Energy Assessment Procedure (NEAP) published by Sustainable Energy Authority of Ireland.

We have used Industry standard modelling tools to show us the detailed requirements for this scheme; IES, DEAP, CIBSE standards.

Our in depth analysis and design modelling of the development shows that the most suitable renewable technology which will assist in meeting these targets is an Air to Air heat pump for heating and hot water use in the building.

This form of heating combined with the building envelope performance outlined in the attached Part L Appendix will offer Compliance & meet NZEB.

2. ENERGY CONSERVATION & RENEWABLE ENERGY

The development will be constructed with high a standard of insulation & air tightness which aims to exceed the requirements of Part L Building Regulations.

Energy demand minimization will be achieved by best practise in high efficiency renewable energy heating systems and energy efficient building design. All windows will come with high performance glazing.

The appended Part L compliance summary (Appendix A) document which should be read in conjunction with this document outlines the specification of individual building elements, building services and items linked to energy efficiency in detail for the typical apartment types occurring throughout the development.

Key Sustainable Design Elements:

- High performance glazing in the windows.
- U values to match or exceed current minimum Part L requirements.
- Low energy lighting throughout the development.
- High levels of air-tightness of the apartments.
- Low temperature air source heat pump system.

2.1 Ventilation

Ventilation will be primarily by natural means in all areas by means of permanent wall vents and windows trickle vents.

Supplemental intermittent mechanical extract ventilation will be provided in bathrooms and kitchen areas in accordance with TGD Part F 2019 of the Building Regulations.

2.2 Heating & Hot water

Heating will be provided via an Air to Water (A2W) High Efficiency Heat Pump system.

Hot Water is to be provided by standalone high efficiency condensing gas boiler system.

2.3 Controls and Zoning

Time and Temperature zone controls to include 1 heating zone and 1 hot water zone, controlled independently via a central programmer.

Primary heating controls include frost & external temperature stats, weather compensation, start/stop optimisation, & master control.

2.4 Thermal Bridging

Building Regulations 2017 TGD Part L Appendix D is defining thermal bridges that occur at junctions between building elements and are included in the calculation of transmission heat losses. All buildings shall have thermal bridges in accordance with "Limiting Thermal Bridging and Air Infiltration – Acceptable Construction Details" as referenced in Building Regulations 2017 TGD Part L.

2.5 External Lighting

All external lighting fittings shall be of energy efficient LED type. External lighting will be completed on a phased basis in conjunction with completion of the street areas. Separate Lighting Mini pillars are to be located within each street zone so as to allow for connection & powering up of lighting as the development is ongoing.

The Lighting scheme design & Layout will be in accordance with the ILP Design procedures & the following Codes of practice.

- BS5489-1:2013 Part 1 Class P4
- CIBSE CoL code for lighting 2002
- FF7 Environmental consideration for exterior lighting.

The Lighting Design for this Development will be in accordance with the requirements of ILP (Institute of Lighting Professionals) Guidance design Document.

The Environmental impact of lighting is taken into consideration & Table 2. 'Obtrusive Light limitations for exterior lighting Installations' of the Environmental Guidance Document are the basis for reference.

Where E3 Lighting is installed, the Design will conform to;

1. Upward Light ratio (sky Glow ULR) max 5%
2. Light Intrusion into windows (LUX) post curfew 2 Lumens
3. Max Luminaire Intensity 1000 Candelas

Where E2 Lighting is installed, the Design will conform to;

1. Upward Light ratio (sky Glow ULR) max 2.5%
2. Light Intrusion into windows (LUX) post curfew 1 Lumens
3. Max Luminaire Intensity 500 Candelas

Calculations are based on using Light fittings which are mounted flat (no tilt) & therefore there is 0% up light. The max luminous intensities are designed to be within the requirements as set out in E3 & E2 noted above.

2.5.1 External Lighting and Bat Conservation

External lighting shall be designed to help mitigate impact on bats.

Low UV content sources with narrow wavebands, such as LEDs, have least impact on bats and shall be used.

Lighting will be directed to where it is needed and light spill shall be avoided. This will be achieved by use of suitably designed luminaires which use accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

Lighting columns will be as short as is possible, since light at a low height reduces the ecological impact. However, where there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. The

acceptable level of lighting will vary, dependent on the surroundings and on the species of bat affected.

External lighting will be installed with lighting controls to allow movement detection to ensure lighting is off when not required. Light scheduling to also allow light output to be dimmed from 100% to 0% based upon available daylight.

Movement sensing will be incorporated to ensure energizing of lights is limited only lights necessary for lighting in the vicinity of detected movement.

Lighting controls will include time scheduling to ensure that lighting can be turned off at suitable time schedules.

Lighting control sensors will have motion detection field limited to movement areas only and shall not extend to detect movement beyond the site boundary.

2.6 Availability of Utility Services

This section addresses the availability, location and adequacy of the primary services serving proposed development.

2.6.1 Water Supply

A new mains water supply shall be extended to facilitate the proposed development. An application for water and drainage connection shall be submitted to Irish Water by the Civil Engineer.

2.6.2 Gas

An existing gas services to the current building on site shall be disconnected and removed.

A new natural gas supply which be extended from Goatstown Road into the proposed development and will be used to produce hot water only. Heating within the development shall be by means of air source heat pumps.



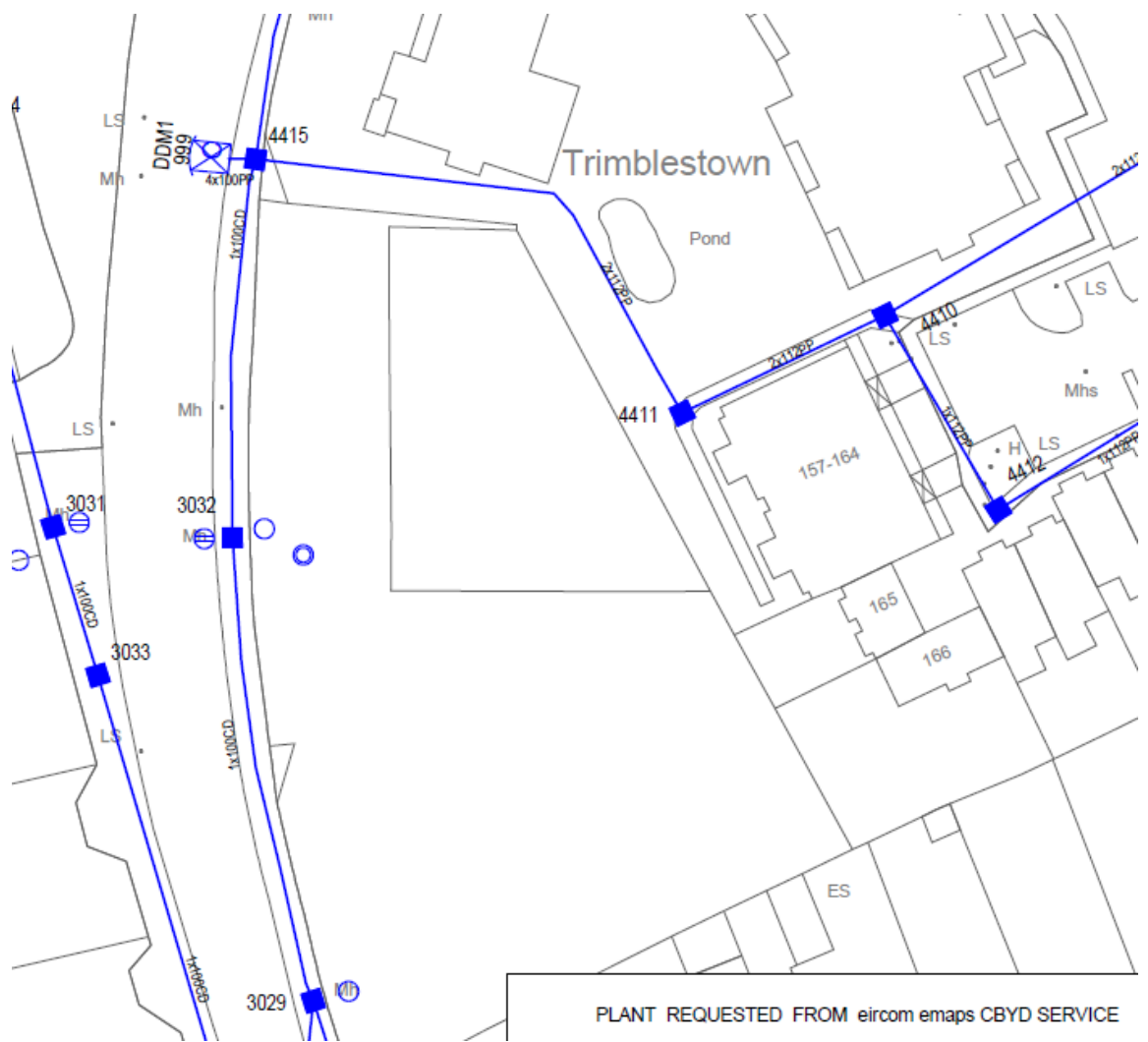
2.6.3 Electricity

The existing ESB supply to the school must be diverted. The current supply cable passes through the proposed location for the extension.

A network alteration application will be issued to ESBN to divert the cable as indicated on drawing ME-1000. An increase in MIC is not required.

2.6.4 Telecoms

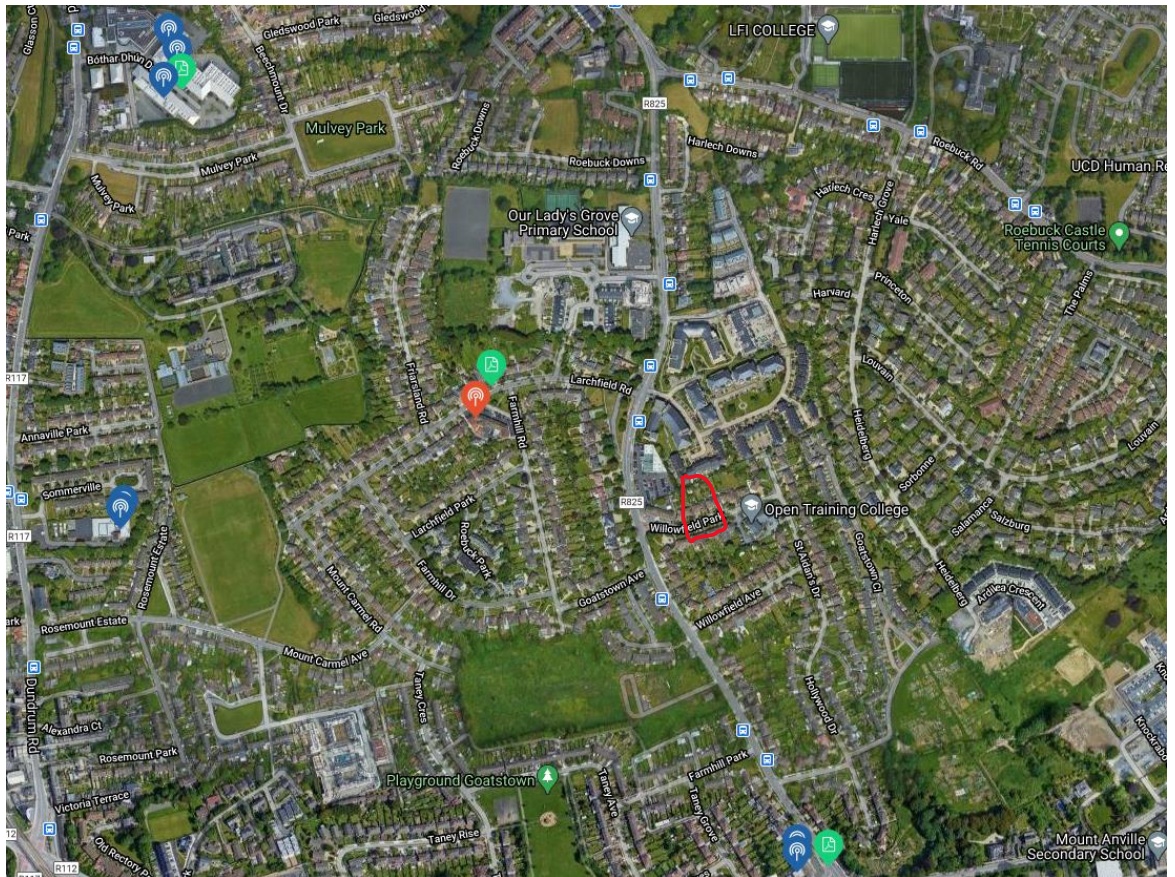
The development will be serviced with new fibre optic cabling extended from the existing Eir services in Goatstown Road.






2.7 Telecommunications

We have reviewed the location of existing registered and documented telecommunication sites surrounding the proposed development.

The height and scale of the proposed development should have no impact on any current microwave telecommunications channels within 2km of the proposed development.



Comreg Site Viewer

	Three/Vodafone Masts		Locations of Radiation Surveys		Closest Mast
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In the unlikely event that the development has any impact this will be realised during the construction period. At this stage we will engage with telecommunication companies to re-align their microwave links to new hop* sites to mitigate any issues.

* hop site: wireless telecommunications link where cabling is not appropriate.

APPENDIX A

Part L Compliance Summary

Below is the summary page from the NEAP SBEMie Part L Analysis completed on the project showing compliance with all aspects of the Part L Requirements, including MPEPC, MPCPC, RER and U-Values.

The full report is available as an accompaniment to this Energy & Sustainability Statement.

BRIRL Output Document

Compliance Assessment with the Building Regulations (Ireland) TGD-Part L 2017

This report demonstrates compliance with specific aspects of Part L of the Building Regulations. Compliance with all aspects of Part L is a legal requirement. Demonstration of how compliance with every aspect is achieved may be sought from the Building Control Authority.

Goatstown Student Acc

Date: Wed Feb 19 09:39:05 2020

Administrative information

Building Details

Address: Goatstown Road, Dulbin 14, Co Dublin, Address 4, Co. Dublin, Eircode

NEAP

Calculation engine: SBEMIE
 Calculation engine version: v5.5.h.1
 Interface to calculation engine: Virtual Environment
 Interface to calculation engine version: 7.0.12
 BRIRL compliance check version: v5.5.h.0

Client Details

Name: Orchid Residential Ltd
 Telephone number: Phone
 Address: Rock Farm, Brittas Bay, Co. Wicklow, Eircode

Energy Assessor Details

Name: Ronan Meally
 Telephone number: 0567795428
 Email: ronan@rmce.ie
 Address: RMCE, City Wall, James Street, Kilkenny, Co. Kilkenny, Eircode

Primary Energy Consumption, CO2 Emissions, and Renewable Energy Ratio

The compliance criteria in the TGD-L have been met.

Calculated CO2 emission rate from Reference building	35.9 kgCO2/m2.annum
Calculated CO2 emission rate from Actual building	34.6 kgCO2/m2.annum
Carbon Performance Coefficient (CPC)	0.96
Maximum Permitted Carbon Performance Coefficient (MPCPC)	1.15
Calculated primary energy consumption rate from Reference building	194.2 kWh/m2.annum
Calculated primary energy consumption rate from Actual building	181.8 kWh/m2.annum
Energy Performance Coefficient (EPC)	0.94
Maximum Permitted Energy Performance Coefficient (MPEPC)	1
Renewable Energy Ratio (RER)	0.22
Minimum Renewable Energy Ratio	0.2

Heat Transmission through Building Fabric

Element	U _a -Limit	U _a -Calc	U _i -Limit	U _i -Calc	Surface with maximum U-value*
Walls**	0.21	0.21	0.6	0.21	GF000001_W1
Floors (ground and exposed)	0.21	0.21	0.6	0.21	GF000000_F
Pitched roofs	0.16	-	0.3	-	"No heat loss pitched roofs"
Flat roofs	0.2	0.16	0.3	0.16	GF000002_C
Windows, roof windows, and rooflights	1.6	1.6	3	1.6	GF000001_W1_O0
Personnel doors	1.6	-	3	-	"No ext. personnel doors"
Vehicle access & similar large doors	1.5	-	3	-	"No ext. vehicle access doors"
High usage entrance doors	3	-	3	-	"No ext. high usage entrance doors"

U_a-Limit = Limiting area-weighted average U-values [W/(m2K)]
 U_a-Calc = Calculated area-weighted average U-values [W/(m2K)]
 U_i-Limit = Limiting individual element U-values [W/(m2K)]
 U_i-Calc = Calculated individual element U-values [W/(m2K)]

* There might be more than one surface with the maximum U-value. ** Automatic U-value check by the tool does not apply to curtain walls whose area-weighted average and individual limiting standards are 1.8 and 3 W/m2K, respectively.

Air Permeability	Upper Limit	This Building's Value
m3/(h.m2) at 50 Pa	5	5

ISSUE REGISTRATION:

Project Title: Goatstown Student ACC

Project No: 19K113

Rev	Date	Purpose of Issue/Nature of Revision	Prepared by	Issue Authorised by
Rev 1	27/07/20	Information	JG	RM
Rev 2	17/08/20	Clarifications	JG	RM
Rev 3	24/08/20	Clarifications	JG	RM
Rev 4	01/09/20	Correcting Blurred Final Page	CA	RM
Rev 5	25/03/22	Information	JG	RM

This document takes into account the particular instructions and requirements of our Client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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