ENERGY STATEMENT / SUSTAINABILITY REPORT

for the

PROPOSED SHARED LIVING DEVELOPMENT

at

PHIBSBOROUGH SHOPPING CENTRE
PHIBSBOROUGH ROAD
DUBLIN 7

for

La Vallee House
Upper Dargle Road
Bray, Co. Wicklow
A98 W2H9
Ireland

p: 00 353 (0)1 204 0005
e: info@metec.ie
w: www.metec.ie

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EXECUTIVE SUMMARY

This Energy Statement has been prepared by METEC Consulting Engineers to support the planning application for the alterations to the permitted redevelopment Phibsborough Shopping Centre.

The proposed development consists of the alterations to existing permitted development at Phibsborough Shopping Centre (as permitted under DCC Reg. Ref.: 2628/17, ABP Reg. Ref.: ABP-300241-17) from student accommodation to shared accommodation. The proposed development proposes the reconfiguration and alteration of the existing permitted student development buildings layouts and arrangement to accommodate a 321 bed shared accommodation and associated facilities. This includes a minor relocation of the building footprints, a minor increase in height, proposed new roof gardens and other minor alterations in respect of the wider permitted scheme, as a result of the alteration to shared accommodation, are also included. A full description of the alterations is set out in the Statutory Notices.

This report aims to satisfy the legislative planning requirements by addressing how the overall energy strategy of the proposed development has been approached in a holistic manner, striving to meet the highest standards of sustainable building design such as passive solar design, high efficiency systems and use of renewable energy technologies.

This report also addresses how the proposed development will comply with the current edition of Technical Guidance Document (TGD) Part L 2017 for Buildings Other Than Dwellings.

Summary of the proposed Sustainability targets:

Building Energy Rating (BER) using SEAI's NEAP Methodology.	Targeting an A3/B1 BER

Summary of the Energy Performance Quality Assurance checks carried out:

TGD part L 2017 Section 1.1 – Limitation of CO2 emissions Compliance approach in terms of reducing overall primary consumption and CO2 emissions.	✓
TGD part L 2017 Section 1.2 – Renewable Energy Technologies Compliance in terms of meeting Renewable energy production.	✓
TGD part L 2017 Section 1.3 – Building Fabric. Compliance in terms of fabric insulation, thermal bridging and air permeability.	✓
TGD part L 2017 Section 1.4 – Building Services Compliance in terms of building services plant efficiency, controls, artificial lighting, insulation of pipes, ductwork and storage vessels.	✓
TGD part L 2017 Section 1.5 – Construction Quality and Commissioning of Building Services Commissioning of space heating and water heating systems.	✓
TGD part L 2017 Section 1.6 – User Information. Provision of operation and maintenance information to building occupants.	✓

1.0 INTRODUCTION

This Energy Statement has been prepared by METEC Consulting Engineers to support the planning application for the alterations to the permitted redevelopment Phibsborough Shopping Centre.
This report aims to satisfy the legislative planning requirements by addressing how the overall energy strategy of the proposed development has been approached in a holistic manner, striving to meet the highest standards of sustainable building design such as passive solar design, high efficiency systems and use of renewable energy technologies.

This report also addresses how the proposed development will comply with the current edition of Technical Guidance Document (TGD) Part L 2017 for Buildings Other Than Dwellings. The principles underpinning Part L compliance are energy demand reduction through passive measures and increased supply from renewable and efficient sources. The proposed design will follow this principle.

2.0 DESCRIPTION OF THE PROPOSED WORKS

The proposed development consists of the alterations to existing permitted development at Phibsborough Shopping Centre (as permitted under DCC Reg. Ref.: 2628/17, ABP Reg. Ref.: ABP-300241-17) from student accommodation to shared accommodation. The proposed development proposes the reconfiguration and alteration of the existing permitted student development buildings layouts and arrangement to accommodate a 321 bed shared accommodation and associated facilities. This includes a minor relocation of the building footprints, a minor increase in height, proposed new roof gardens and other minor alterations in respect of the wider permitted scheme, as a result of the alteration to shared accommodation, are also included. A full description of the alterations is set out in the Statutory Notices.

3.0 REFERENCE DOCUMENTS

Throughout the Planning, Design and Construction phases for this project the following legislative and best practice documents will be referenced to ensure that energy efficiency, carbon emissions, local environmental policies, recognised sustainable design practices remain at the forefront of the design development.

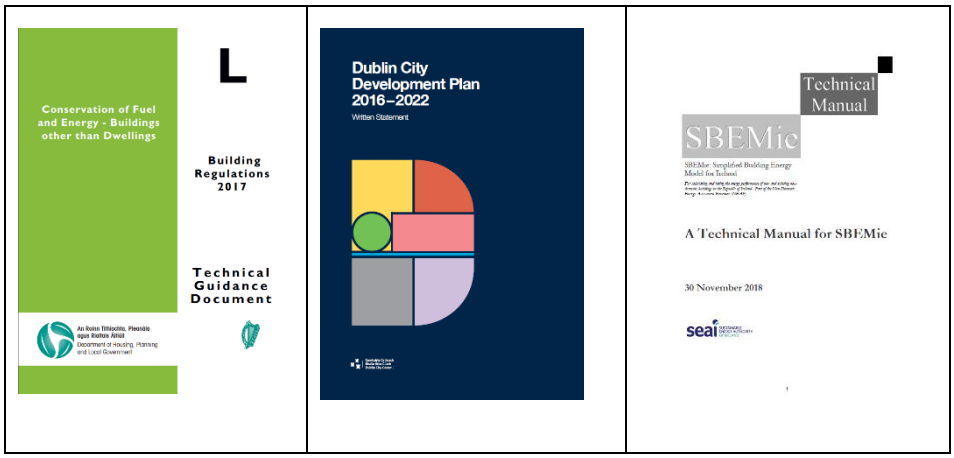

Figure 3.0.1

4.0 BUILDING PERFORMANCE SIMULATION MODEL

A building performance simulation model for the Phibsborough Shared Living development has been constructed. This allows us to run simulations to advise the client and the design team in terms of the optimum thermal and solar performance of the building fabric. It also allowed us to advise on the achievement of TGD Part L of the Building Regulations.

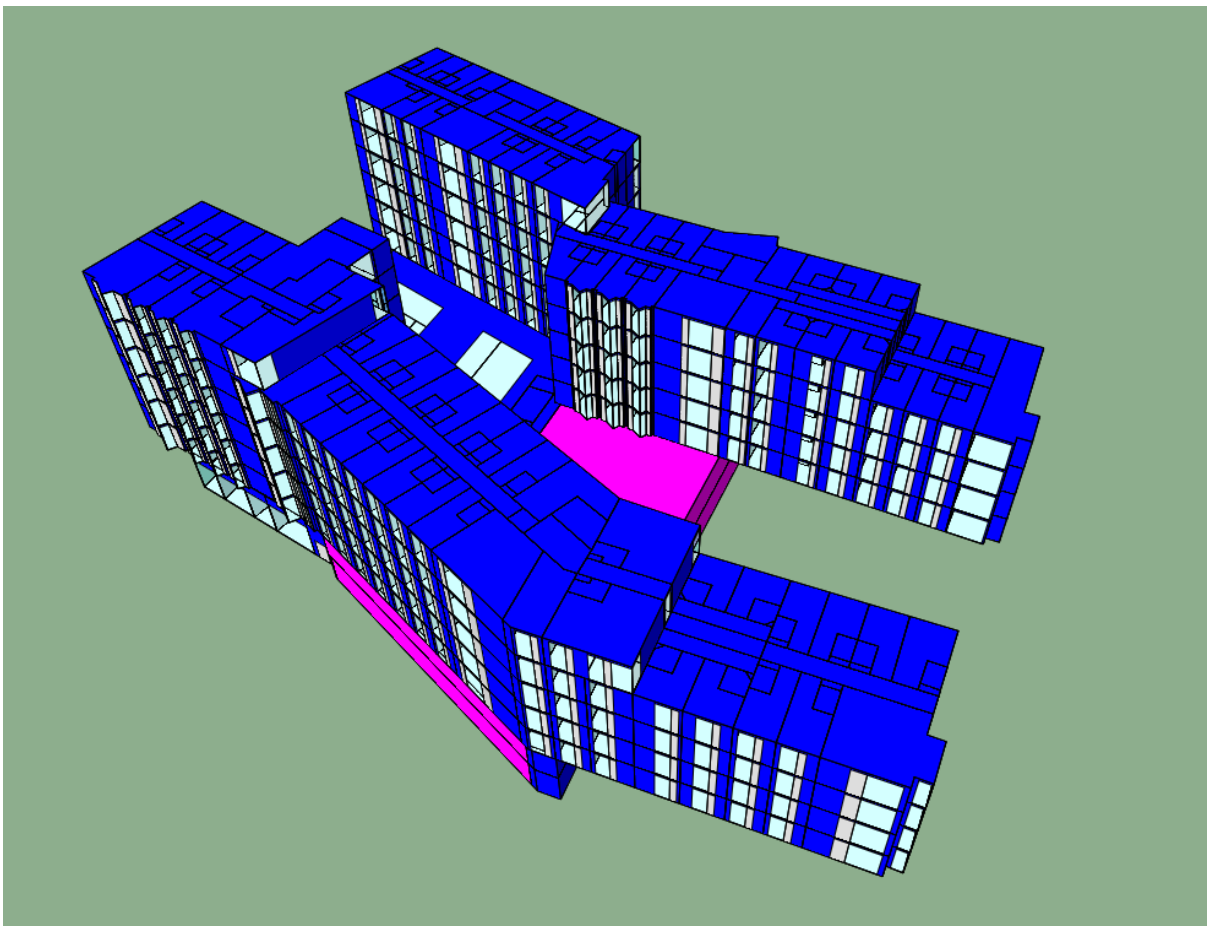

Figure 4.0.1 – 3D model image for the IES VE Building Performance Simulation model for the Phibsborough Shared Living Development. The software is approved by the SEAI for Part L and BER calculations.

5.0 SUSTAINABILITY BRIEF

The current design intent is to target the following sustainability metrics for this proposed project;

- Compliance with energy code Part L 2017 of the Building Regulations.
- A3 Building Energy Rating (currently only 1.3% of non-domestic buildings in Ireland with registered BER's have achieved an A3 rating or better).

The design intent is to also focus on reducing the overall potable water consumption and to generate on-site renewable energy by means of heat pumps.

Environmental Rating Systems which this development is seeking to achieve.

6.0 PART L OF THE BUILDING REGULATIONS COMPLIANCE

The proposed development shall meet, and where possible exceed the requirements within the current edition of Technical Guidance Document Part L of the Building Regulations for Buildings other than Dwellings.

6.1 BUILDING ENVELOPE

BUILDING FABRIC THERMAL PERFORMANCE

In order to achieve the Sustainability targets for this project the thermal performance of the building envelope will be upgraded to a performance specification that greatly exceed the minimum requirements which are set out in Technical Guidance Document Part L of the Building Regulations (2017).

Fabric Elements	**Area Weighted Average Elemental U-Value (W/m² °K)**	
	Min. TGD Part L 2017 requirements (Table 1)	**Improved Specification that will be targeted for Phibsborough Shared Living**
Existing Building (Material Alterations Works)		
Flat Roof (Warm Roof)	0.20	≤0.15
External Walls	0.21	≤0.18
Ground Floor	0.21	≤0.15
Windows, Doors & Rooflights	1.6	≤1.4 (Including Frame)
Curtain Walling	1.8	≤1.4 (Including Frame)

Table 6.1.1

THERMAL BRIDGING

To avoid excessive heat losses and local condensation problems, reasonable care should be taken to ensure continuity of insulation and to limit local thermal bridging, e.g. around windows, doors and other wall openings, at junctions between elements and other locations. Any thermal bridge should not pose a risk of surface or interstitial condensation.

BUILDING ENVELOPE AIR PERMEABILITY

Building Air Tightness / Air Permeability		
	Phibsborough Shared Living Target	**Min. TGD Part L 2017 requirements**
Air Permeability	≤ 3.0 m³ / (h.m²) @ 50Pa (target).	≤ 5.0 m³ / (h.m²) @ 50Pa

Table 6.1.2

GLAZING SOLAR SPECIFICATION

Windows / Curtain Walling Solar Specification		
Element	**Phibsborough Shared Living Target**	**Min. TGD Part L 2017 requirements**
G-Value	0.45-0.55	No specific value given

Table 6.1.3

A G-Value for the glazing in the range of 0.45 – 0.55 will ensure that the extent of unwanted solar gain is significantly reduced which in turn also reduces overheating.

A G-Value of this range is the optimum balance in terms of solar and light transmittance.

A g-value of 1.0 represents full transmittance of all solar radiation while 0.0 represents a window with no solar energy transmittance.

6.2 BUILDING SERVICES (MECHANICAL AND ELECTRICAL SYSTEMS)

BUILDING SERVICES (MECHANICAL AND ELECTRICAL SYSTEMS)

The intent is to ensure that the building services design strategy is to utilise as many sustainable design options and energy efficient features that are technically, environmentally and economically feasible for the project. Making the right decisions in relation to design / construction can contribute greatly to the sustainability of a building over its lifetime, which will lead to cost savings in the future and raise comfort levels for the future occupants of this development.

VENTILATION

Phibsborough Shared Living will be ventilated using Mechanical Ventilation with Heat Recovery (MVHR). All fans specified will come complete with Variable Speed Drives. Specific Fan Powers (SFPe) specified will be ≤1.6 Watts / litre / second which is in line with the minimum energy efficiency standard (Non-Domestic Building Services Compliance Guide: 2013 edition + Table 4 in TGD Part L 2017 – maximum specific fan power in air distribution systems).

Minimum fresh air ventilation rates (compliant with the Irish Building Regulations and CIBSE will be provided by means of a number 100% outside air MVHR Units, supply and return ventilation system complete with high heat recovery efficiency plate heat exchangers / thermal wheel. Heat recovery will be utilised to transfer energy from the extract air to the supply air with little or no cross contamination of air streams.

In addition, air from the cooker extraction hoods will be passed through the heat recovery systems to recover the heat for use in the incoming fresh air.

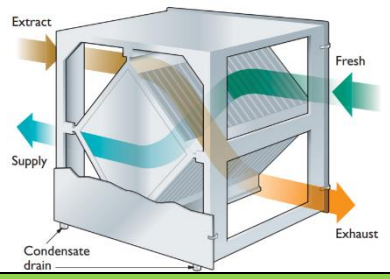	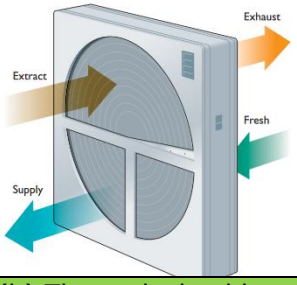
Option (a) Cross flow plate heat exchanger heat recovery	Option (b) Thermal wheel heat recovery

Table 6.2.1

Heating & Cooling Strategy – Offices, Study Rooms and other communal rooms.

[VRF System with Heat Recovery]

The Offices, Study Rooms and other communal rooms will be heated and cooled by means of Variable Refrigerant Flow (VRF) fan coil units with EC motors. Output is controlled by measuring the return temperature and adjusting the flow of hot or cold refrigerant through the fan coil unit to deliver the necessary heating or cooling. Figure 6.2.2 below shows how the fan coil unit and other ventilation services are positioned within the ceiling void.

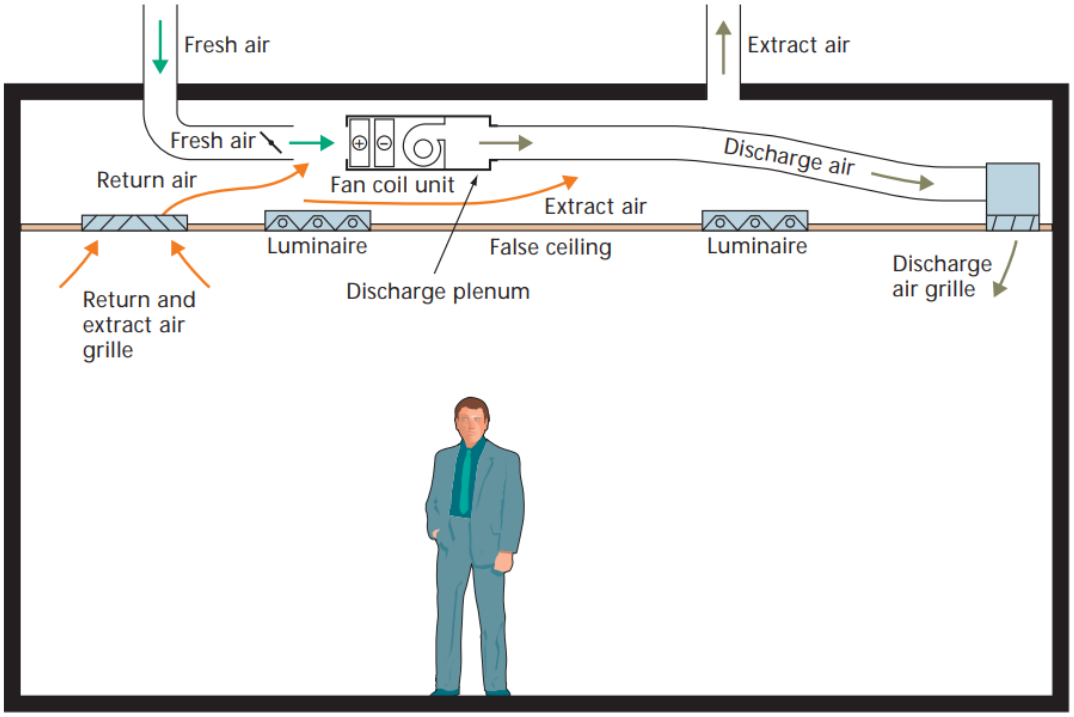

Figure 6.2.2 Operation of a VRF Fan Coil Unit in a ceiling void.

The operation of a VRF fan coil unit requires a supply of heated or cooled refrigerant to be supplied to the fan coil unit.

Depending on the time of year and with variable occupancy levels, the heating or cooling needs of the building will be constantly changing. To overcome this in a sustainable manner, the VRF system is capable of recovering heat from areas which require cooling and directing this heat to areas requiring heating. This is known as "Simultaneous Heating & Cooling" or "3 pipe VRF" and saves significant amounts of energy over the course of the year when operating in heat recovery mode. Phibsborough Shared Living will have such a system installed in areas requiring heating and cooling such as the Offices, Study Rooms and other communal rooms.

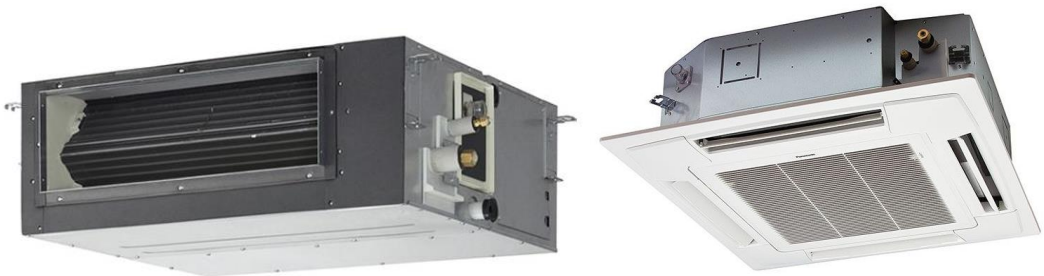

Figure 6.2.3 – Typical VRF Indoor Units

Figure 6.2.4 – Typical VRF Outdoor Unit

Heating & Ventilation Strategy – Bedrooms, Living Rooms, Hallways [MVHR with Electric Radiators]

The design intent is to utilise high efficiency Mechanical Ventilation with Heat Recovery (MVHR) to provide high air quality in the occupied spaces and also to minimise heating needs. As the heat loads for this building are extremely low, electric radiators can provide efficient space heating. While electric heating was not regarded as a low carbon heating solution in the past, modern electric radiators have accurate time and temperature control that keeps energy consumption to a minimum.

Figure 6.2.5 – Typical modern electric radiator with temperature control

DOMESTIC HOT WATER

The proposed development will have a need for significant volumes of hot water and also a need to produce it in an energy efficient manner. Traditionally, natural gas has been the preferred fuel for producing hot water in large volumes. There are issues with such an approach going forward as natural gas is a fossil fuels and there is currently no alternative to natural gas which can eliminate the need for the consumption of fossil fuels.

The Design Team are looking at various approaches using a Heat Pump to produce hot water in sufficient volume in an energy efficient manner. Heat Pump technology is rapidly improving and there are currently heat pumps on the market which can produce hot water efficiently. There is an added advantage to using heat pumps in this manner, as the national electricity grid continues to decarbonise, the building will become more environmentally friendly in time and as such is future proofed.

LIGHTING DESIGN

Lighting to be provided by LED luminaires. Good lighting design has a double benefit as it can help reduce internal heat gains, thus reducing the AC Loads and overheating risks.

The design intent shall be to encourage the maximum use of daylight and to avoid unnecessary artificial lighting, particularly when spaces are unoccupied, having regard to the need to ensure that the operation of automatically switched lighting systems does not endanger occupants in a building. Lighting controls in buildings should follow the guidance in BRE Digest 498 Selecting Lighting Controls. As best practice occupancy control shall be provided throughout and photoelectric dimming where the spaces are daylit. Lighting controllers with low parasitic power will be specified for this project.

The design intent is to maintain installed lighting loads of 6 - 8 watts / m² in areas such as offices, study space and other areas requiring higher levels of lighting.

The design intent is to maintain installed lighting loads of 3 - 5 watts / m² in areas such as bedrooms, bathrooms, living areas and other areas requiring lower levels of lighting.

In addition, where possible, occupancy sensors will be installed so that the lighting is switched off when there is no requirement for it.

VERTICAL TRANSPORTATION – LIFTS

Where new lifts are specified an analysis of the transport demand and usage patterns for the building shall be carried out to determine the optimum number, and size of lifts. Where new lifts are specified, they shall be capable of achieving the following;

- Operating in standby mode during off-peak and idle periods. For example, the power side of the lift controller and other operating equipment such as lift car lighting, user displays and ventilation fans switch off when the lift has been idle for a prescribed length of time.
- The lift car lighting and display lighting provides an average lamp efficacy (across all fittings in the car) of >55 lamp lumens/circuit Watt.
- The lift uses a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor.

7.0 BUILDING ENERGY RATING (BER)

A building energy rating is a rating on the overall energy efficiency of a building (residential or commercial). The rating is similar to the energy label on your fridge and is denoted on scale of A to G, with A1 being the most energy efficient and G being the least energy efficient. Our client is targeting a BER of A3 for this building.

Only 1.3% of the registered BER's for non-domestic buildings in Ireland are A3-Rated (which includes A1+A2 BER's). This will ensure that the Phibsborough Shared Living building will be in the top 1.3% of energy efficient non-domestic buildings in Ireland.

The data below was obtained by METEC from the Central Statistics office (https://www.cso.ie/en/releasesandpublications/er/ndber/non-domesticbuildingenergyratingsq32019/).

NON-DOMESTIC BERs BY GRADE (On Public Register and Not Expired - Current)

Energy Rating	Quantity
A1	14
A2	89
A3	636
B1	1,114
B2	2,563
B3	4,397
C1	7,130
C2	6,898
C3	5,588
D1	7,017
D2	5,345
E1	3,641
E2	2,801
F	3,757
G	7,099
Total	**58,089**

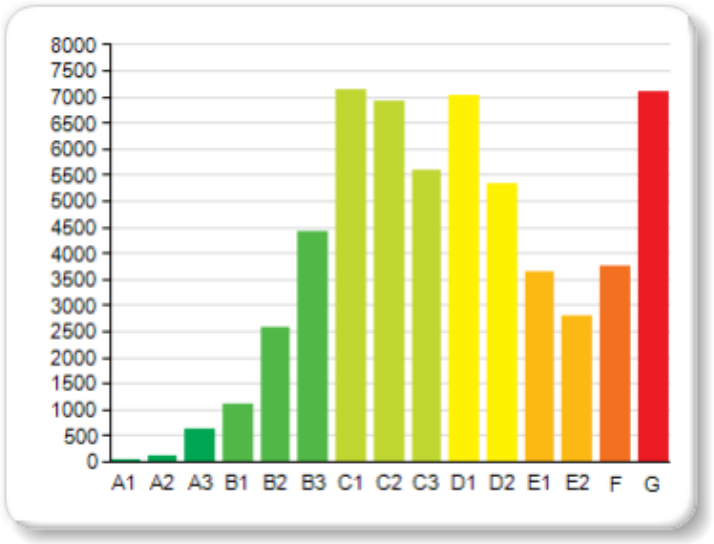

Figure 7.0.1

Valid Building Energy Ratings by Rating (as of 08/02/2020)

8.0 POTABLE WATER CONSERVATION MEASURES

Potable water is a valuable natural resource therefore its consumption in buildings should be conserved. Beginning in pre-design and continuing throughout the design phases, the Design Team is committed to identify opportunities to reduce potable water consumption for this project.

The Design Team will explore how to reduce potable water loads in the building and accomplish related sustainability goals. This exercise will assess and estimate the project's potential non-potable water supply sources and water demand volumes, including the following:

- Indoor water demand. Assess flow and flush fixture design case demand volumes
- Outdoor water demand. Assess landscape irrigation design case demand volume calculated
- Supply sources. Assess all potential non-potable water supply source volumes, such as on-site rainwater and municipally supplied non-potable water.

	
Dual Flush Toilets	Sensor Taps
	
Low Flush & Waterless Urinals	Shower Outlet Flow Regulator to achieve 6 litres per minute or less.

Figure 8.0.1

Figure 8.0.1 examples Sanitary ware fixtures and fittings that will be reviewed in detail in order to help reduce potable water consumption for this project.

9.0 SUSTAINABLE MODES OF TRANSPORTATION

Our Client, MM Capital and the design team recognise the importance of creating a sustainable development which interplays between good urban design, accessibility to sustainable modes of transportation, maximising the links between existing social and community infrastructure and the most efficient use of energy and natural resources.

This development is well located for access to public transport. There are numerous Dublin Bus and Bus Eireann bus routes within a short distance making access to the building from all areas of Dublin possible. These bus routes will encourage the future building users and visitors to consider sustainable modes of transport when wishing to visit the building.

ENCOURAGING CYCLING

Encouraging building visitors and staff to cycle to & from the site is a key aim of our client and dedicated secure space for parking bikes will be provided at the main entrance to the building. There are also shower and drying room facilities provided which will assist cyclists.