



Consulting Engineers

Engineering Consultants
Camden Business Centre
12 Camden Row
Dublin 8
Ireland

Phone: +353 1 4790594

Web: www.jak.ie

Email: info@jak.ie

SUSTAINABILITY REPORT
FOR
SEAMOUNT DEVELOPMENT, MALAHIDE

Project Reference:	J546
Revision Ref:	C
Date Prepared:	1 ST October 2019
Date Issued:	4 Th November 2019
Prepared By:	Jonathan Kirwan & Martin Obst

CONTENTS

1. INTRODUCTION	3
2. EXECUTIVE SUMMARY	3
3. BUILDING REGULATIONS.....	4
4. SUSTAINABILITY & ENERGY STATEMENT	5
5. ACOUSTIC STATEMENT	7
6. INFRASTRUCTURE.....	8

1. INTRODUCTION

The purpose of this report is to outline and also to confirm that the dwellings in the development will be built in compliance with NZEB requirements as per the new Part L Dwellings (2019). The compliance is assessed using the upgraded Domestic Energy Assessment Procedure (DEAP Version 4.2.1)

The proposed development provides a mix of high-quality housing and apartments, at an elevated site in the built up area of Malahide. The development includes 142 residential unit scheme with Creche as follows:

Houses	58
Apartments	76
Maisonettes	8

2. EXECUTIVE SUMMARY

The proposed development will develop an infill site providing a new principal access to the future public park creating an active and vibrant environment. With its density and layout, will promote the efficient use of land and of energy. Its location in relation to walking distance to public transport, and cycling routes will also reduce greenhouse gas emissions.

The residential units in the development shall be constructed to achieve a high level of thermal efficiency with highly insulated building fabric and optimising passive solar gains. Our design employs that all apartments will have a very high energy performance & amount of energy required will be covered by high efficiency heat pumps.

Our in-depth analysis and design modelling of the development will show that the most suitable system employs high efficiency heat pumps for each apartment serving both heating and hot water.

The dwellings shall be constructed to comply with the current required levels of noise as per Technical Guidance Document E, Sound

Proposed creche will have building fabric U value levels in compliance with Part L 2017 (Other than Dwelling) and shall be fitted as shell and core only. Future tenant will be obliged to fit out M&E system to comply with Part L.

3. BUILDING REGULATIONS

PART L & NEARLY ZERO-ENERGY BUILDING

The new Part L (2019) of building regulations is now in place and this document is the new standard for dwelling constructed after October 2019.

The Part L 2019 set building fabric and energy performance to achieve Nearly Zero-Energy Building.

Nearly Zero-Energy Building (NZEB): means a building that has a very high energy performance as determined in accordance with Annex I of the EU Energy Performance of Buildings Directive Recast (EPBD Recast). 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.

EPC & CPC

In order to achieve the acceptable primary energy consumption rate for a nearly zero energy dwelling, the calculated energy performance coefficient (EPC) of the dwelling being assessed should be no greater than the Maximum Permitted Energy Performance Coefficient (MPEPC). The MPEPC for a nearly zero energy dwelling is 0.30.

To demonstrate that an acceptable CO₂ emission rate has been achieved for a nearly zero energy dwelling, the calculated carbon performance coefficient (CPC) of the dwelling being assessed should be no greater than the Maximum Permitted Carbon Performance Coefficient (MPCPC). The MPCPC for a nearly zero energy dwelling is 0.35.

RENEWABLE ENERGY RATIO

The Part L 2019 introduces Renewable Energy Ratio (RER) is the ratio of the primary energy from renewable energy sources to total primary energy as defined and calculated in DEAP. Minimum RER is 0.2 and this index is replacing Part L 2011 Renewable contribution.

RENEWABLE ENERGY RATIO FOR COMMON AREAS

Where there are both common areas and individual dwellings in a building, reasonable provision would be to show that the average contribution of renewable technologies to all areas meets the minimum level of renewable provision to the individual dwellings and common areas combined. In case of apartment block, a proportion of the renewables should be provided to each area and individual dwelling in the building. This proportion shall be qualified by design value of RER to be 0.25 where the excess RER would satisfy this requirement.

4. SUSTAINABILITY & ENERGY STATEMENT

The proposed development will develop an infill site providing a new principal access to the future public park creating an active and vibrant environment. With its density and layout, will promote the efficient use of land and of energy. Its location in relation to walking distance to public transport, and cycling routes will also reduce greenhouse gas emissions.

To reduce energy demand of the dwellings will be constructed with high standard of insulation & air tightness. Additional energy demand reduction will be achieved by applying passive design techniques. The design of the fabric and proposed equipment will satisfy the requirements of new Part L Building Regulations and NZEB.

The specification of individual building elements, building services and items linked to energy efficiency was reviewed in detail for the typical dwelling types occurring throughout the development to ensure compliance with the building regulations and requirements of the local council.

Key Sustainable Design Elements:

- High performance glazing in the windows.
- High levels of insulation
- A+ Low energy LED lighting throughout the development.
- High levels of air-tightness of the dwellings.
- Demand controlled ventilation for each dwelling.
- High efficiency heat pump for each unit serving heating & hot water requirements

WINDOWS AND BUILDING FABRIC

All windows shall be triple glazed windows with a combined thermal transmittance not greater than 1.4W/m²K. All windows shall comply with BS EN ISO 10077-1: 2006 - ‘Thermal performance of windows, doors and shutters. Calculation of thermal transmittance’
Building fabric will include insulation levels sufficient to meet the Part L 2019 U-values.

Table 1. Building Elements U-values

Building Fabric Element	Target U values	Part L 2019 Maximum Elemental U-value
Exposed & Ground floor	0.18 W/m ² K	0.18 W/m ² K
External Wall	0.18 W/m ² K	0.18 W/m ² K
Pitched Roof	0.16 W/m ² K	0.16 W/m ² K
Flat Roof	0.2 W/m ² K	0.2 W/m ² K
External Windows & Doors	1.4 W/m ² K	1.4 W/m ² K

THERMAL BRIDGING ACCEPTABLE CONSTRUCTION DETAILS

Building Regulations TGD L Tables D define thermal bridges that occur at junctions between building elements and are included in the calculation of transmission heat losses. The DEAP calculation includes thermal bridging, at junctions between elements and around openings.

For purpose of this statement and preliminary BER results a value of $y = 0.08 \text{ W/m}^2\text{K}$ was used. Value 0.08 W/m²K may be used for new dwellings whose details conform with “Limiting Thermal Bridging and Air Infiltration – Acceptable Construction Details” as referenced in Building Regulations 2011 TGD L. This requires that the details described in the above document are adhered to and relevant drawings be signed off by the site engineer or architect.

AIR PERMEABILITY

Part L (2019) specify 5 m³/m²/hr @ 50Pa as upper limit for air permeability and also that every house needs to be tested. To reduce heat loss by infiltration the target air permeability will be 3.0 m³/m²/hr @ 50Pa

Air permeability shall be measured by means of pressure testing of a building prior to completion in accordance with BS EN ISO 9972:2015 'Thermal performance of buildings. Determination of air permeability of buildings. Fan pressurization method'

HEATING & HOT WATER

Use of low carbon technology includes High Efficiency Split System Air Source Heat Pumps. This unit and key sustainable measures will satisfy the Renewable Energy Ratio.

The heat pump type should be a single phase All-in-One Combination type Air Source Heat Pump. This is a split (bi-bloc) type system with an external fan unit and internal unit with integrated stainless steel domestic hot water cylinder. The heat pump should be fully compliant with Eco-Design Labelling Directive, both EN14825 and EN16147.

High level of controls and multiple zones will aid to more efficient usage of the system and further reduce the energy demand. For the new DEAP assessment detailed design for hot water fittings will be carried out.

Booster pump and all heating pump shall have energy rating class A.

DEMAND CONTROLLED VENTILATION

Part F of building regulations requires adequate and effective means of ventilation shall be provided for people in buildings. This shall be achieved by:

- (a) limiting the moisture content of the air within the building so that it does not contribute to condensation and mould growth, and
- (b) limiting the concentration of harmful pollutants in the air within the building.

It is proposed that Centralised Extract/Demand controlled ventilation (DCV) system will serve each unit to provide high indoor air quality for the occupants. Max SPF of the fan should not be higher than 0.35 W/l/s and has to be listed on the SAP Appendix Q database.

The design of dwellings shall provide required area of background ventilators via wall vents/trickle vents & undercut doors to wet rooms to provide fresh air in place of extracted air from the wet rooms. Systems should be installed, balanced and commissioned by competent installers eg Quality and Qualifications Ireland accredited or Education Training Board or equivalent. Systems when commissioned and balanced should then be validated to ensure that they achieve the design flow rates by an independent competent person eg NSAI certified or equivalent.

ENERGY SAVING LIGHTING

The new DEAP requires a detailed design of lighting for each dwelling. For this project the calculation of lighting use shall be based on the installed fixed lighting, and on the contribution of daylight. The calculation will include low-energy lighting provided by fixed outlets based on lighting design details (e.g. lamp power and efficacy), lamp type, and number of lamps.

CAR CHARGERS

Number of company incentives by the SEAI are increasing uptake of electric cars in Ireland and Ireland has also set itself the target of ending the sale of cars powered just by fossil fuels by 2030. There is no requirement for the car charging provision from the County Council at the moment however there will be provision included in the development.

Car charger provision will be included at each house adjacent to parking bay. Standard house connection would allow standard charger with output of 3.7kW to be installed by the homeowner. Typical specification of the charger would be (Output 3.7 kW · 16 A, Single phase 230V, Connector IEC61851/IEC62196, RCCB Type A, DC-RCM; EVCC2)

In the case of the apartments all parking spaces will have infrastructure provided which will allow them to be wired for electric car chargers. This will allow for installation of the car charger in any point in the future. In additions there will be provision to install custom system for outdoor parking places which can be used by the visitors and possible car sharing operator space (Gocar, Zipcar). Separate electrical connection would serve the system and the management company or system supplier takes care of access control, utilisation and revenue collection.

5. ACOUSTIC STATEMENT

The dwellings shall be constructed to comply with the current required levels of noise as per Technical Guidance Document E, Sound. The design of building services in the apartment blocks were considered at an early stage in the design process, to reduce their impact on occupants of apartment buildings and to ensure apartment blocks will comply with Part E.

The Professional Guidance on Planning & Noise (ProPG) document (published in May 2017) was taken into consideration as part of design process. Although not an Irish government document, since it's publication it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance

The water tanks and booster sets are located on LGF level adjacent to the LGF level apartments. Equipment selection and installation will ensure maximum allowed noise levels are maintained. The external unit of the heat pumps are located on the balconies. All soild stack to have acoustic insulation installed.

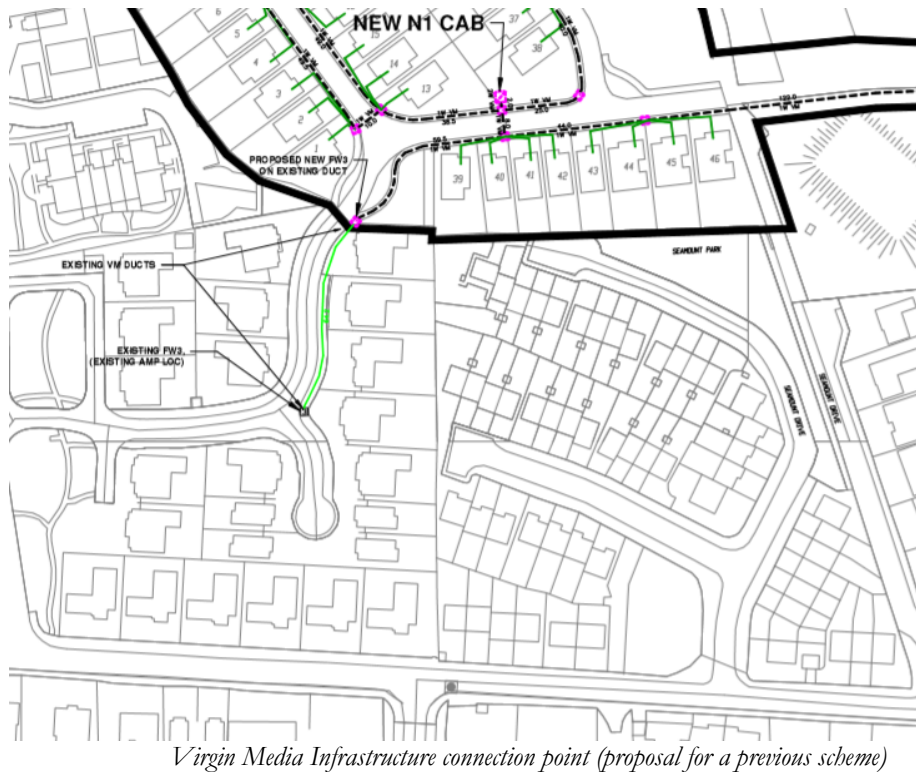
Build-up of podium construction is proposed to avoid excess noise from the underground car park. Predicted noise levels within the dwellings with the implementation of these mitigation measures are within the recommended criteria.

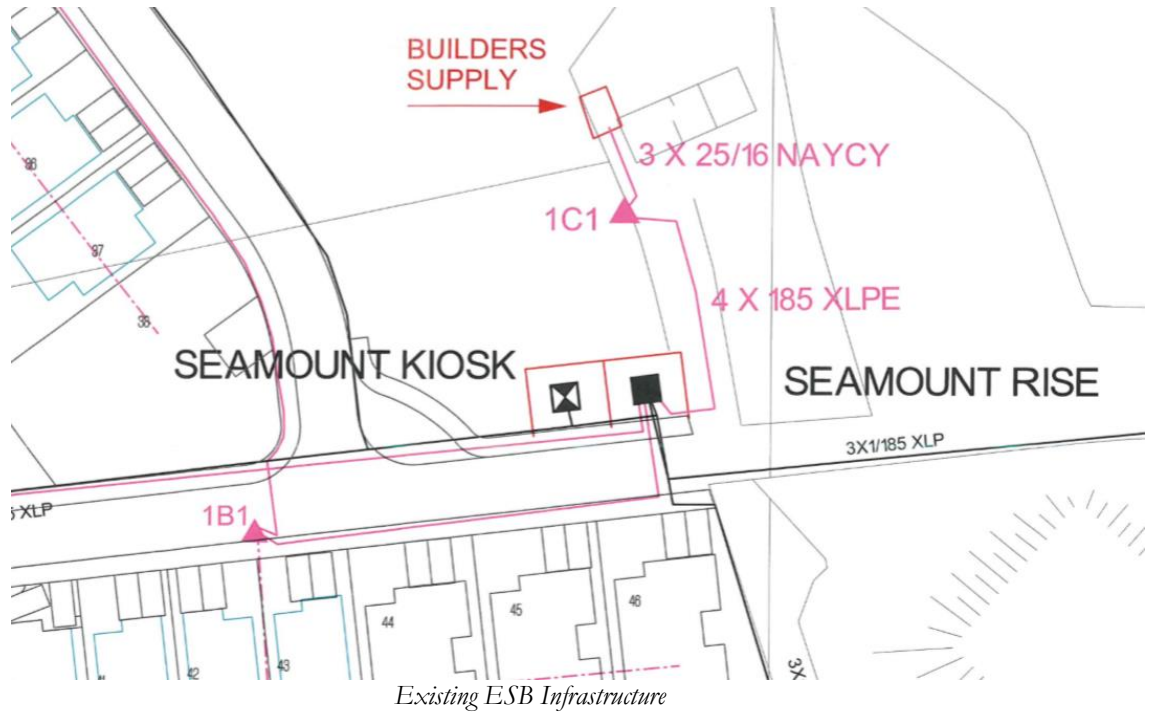
Specified opening hours for the creche shall ensure minimum nuisance to the occupants.

6. INFRASTRUCTURE

The proposed site location is very well serviced by all major utilities. Major spine services for Gas, Electricity Water and Communications have local network sufficient to meet the needs of the new development. Based on the number of dwellings it is envisaged that 1 no. ESB substation shall serve the development.

We have explored utilities which are in immediate proximity to the site & reviewed specific service diversions, service routes and capacities to the site.





We have engaged with ESB to ensure there is enough capacity to serve the development. Based on the number of numbers of residential units the architectural layouts include location of proposed substation in the apartment block.



Ground floor plan indicating ESB Substation locations