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SUSTAINABILITY & ENERGY STATEMENT

FOR

**GOLF LANE DEVELOPMENT,
CARRICKMINES,
DUBLIN 18**

FOR

BOWBECK DAC

Project Reference:	J587
Revision Ref:	A
Date Prepared:	6 th March 2020
Date Issued:	16 th December 2020
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1. PROPOSED DEVELOPMENT

Bowbeck DAC, seek planning permission for a strategic housing development on a site at Golf Lane, Carrickmines, Dublin 18. The site has an area of c. 2.56 hectares and is bound to the north by the M50 motorway, to the east by Golf Lane, to the west by Glenamuck Road, and to the south by existing residential development.

The proposed development comprises a residential development of 482 no. units (all apartments), along with ancillary residential amenities, and provision of a childcare facility, gym, and local shop. The proposed residential units comprise 31 no. studio units, 183 no. 1-bedroom units, 229 no. 2-bedroom units, and 39 no. 3-bedroom units (including 2 no. duplex type units).

The proposed development is set out in 7 no. blocks which comprise the following:

- Block A1 comprises 62. no, apartments within a part four, part six storey building, including 10 no. studio units, 7 no. 1-bedroom units, 41 no. 2 bedroom units, and 4 no. 3-bedroom units. An ESB substation is provided at ground floor level.
- Block A2 comprises 85 no. apartments within a part four, part eight storey building, including 25 no. 1-bedroom units, 45 no. 2-bedroom units, and 15 no. 3-bedroom units.
- Block A3 comprises 79 no. apartments within a part four, part twelve storey building, including 21 no. studio units, 19 no. 1-bedroom units, 28 no. 2-bedroom units, and 11 no. 3-bedroom units.
- Block B0 comprises 150 no. apartments and resident's amenities within a part four, part eighteen, part twenty-one and part twenty-two storey building. The apartments include 76 no. 1-bedroom units, 68 no. 2-bedroom units, and 6 no. 3-bedroom units (including 2 no. duplex type units). An ESB substation, resident's concierge area and amenity space (171 sq.m sq.m) are provided at ground floor level. A further resident's amenity / event space is provided at the twentieth and twenty-first floor levels (83 sq.m).
- Block B1 comprises 8 no. apartments and is four storeys in height, directly abutting Block B. The apartments include 4 no. 1-bedroom units, and 4 no. 2-bedroom units.
- Block C comprises 42 no. apartments and a local shop within a part five, part seven storey building. The apartments include 30 no. 1-bedroom units, 9 no. 2-bedroom units, and 3 no. 3-bedroom units. A local shop (154 sq.m) and an ESB substation are provided at ground floor level.
- Block D comprises 56 no. apartments, a commercial gym, resident's concierge area, resident's lounge, and a childcare facility in a part four, part seven storey building. The apartments include 22 no. 1-bedroom units, and 34 no. 2-bedroom units. The resident's concierge area (99 sq.m), commercial gym (340 sq.m), and childcare facility (300 sq.m) units are located at ground floor level. The resident's lounge (292 sq.m) is located at first floor level.

Two basement levels are proposed, providing car parking spaces (299 no.), bin stores, plant rooms, bicycle parking (1,000 no. spaces), and circulation areas. A further 240 no. bicycle parking spaces and 4 no. car parking spaces are provided at ground level. The proposed development includes landscaping, boundary treatments, public, private and communal open space (including roof terraces), two cycle / pedestrian crossings over the stream at the western side of the site, along with a new pedestrian and cycle crossing of Glenamuck Road South at the west of the site, cycle and pedestrian facilities, play facilities, and lighting. The proposed buildings include the provision of private open space in the form of balconies and winter gardens to all elevations of the proposed buildings. The development also includes vehicular, pedestrian, and cycle accesses, drop off areas, boundary treatments, services, and all associated ancillary and site development works.

2. EXECUTIVE SUMMARY

The proposed development, by reason of its location on a greenfield site, together with its density and layout, will promote the efficient use of land and of energy. It's location in relation to public transport and cycling routes will also reduce greenhouse gas emissions.

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 to a very significant extent by energy from renewable sources.

Our in-depth analysis and design modelling of the development will show that the most suitable system employs centralised plant with high efficiency air heat pumps and thermal stores aided by modulating gas boilers. System serving HIU in each apartment serving both heating and hot water.

Commercial units 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 - Dwelling (2019) of building regulations was put in place and this document is the new standard for dwelling constructed after October 2019.

The Part L – Dwelling 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.

Part L - Buildings other than Dwellings (2017) will apply on the commercial units within the development. The commercial units will be shell and core only and tenant will be responsible for fit-out and to demonstrate the renewable energy contribution. All building elements to have U values better than backstop values specified by the building regulations.

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. CLIMATE CHANGE ADAPTATION STATEMENT

Climate Change Adaptation Statement aims to ensure that this project will be better prepared to respond to current and future climate change impacts by reducing our vulnerability to climate change. Adaptation actions aim to reduce the impacts of climate change and also to take advantage of any opportunities presented by climate change.

Local Authority Adaptation Wizard provided by Climate Ireland was used as a baseline to prepare this statement.



This document divides adaptation responses into 3 basic categories:

- Grey Actions - Technological and engineering solutions.
- Green Actions - Ecosystem based approaches that use the multiple services of nature
- Soft Actions - Managerial, legal and policy approaches that alter human behaviour and style of governance.

Climate Change Adaptation Statement provides effective strategies to lower Greenhouse Gases for the development, with respect to:

- Construction stage – waste management & recycling
- Services - lighting, space heating and hot water,
- Climate-dependent envelope changes – high levels of insulation, air-tightness
- Human behavior - using fewer resources, efficient appliances, efficient transport
- Renewable energy sources - solar photo-voltaics

PROJECT LOCATION

The location of the proposed development close to public transport routes will ensure good connectivity. Its location is walking distance to the Ballyogan wood stop and Bus Routes serving the area.



CLIMATE IMPACT SCREENING

Building sector has high energy demand which includes the energy used during construction, embodied energy of materials used and in addition there is energy demand of the buildings once occupied.

During the construction process waste is generated and efforts to reduce and recycle waste need to be incorporated.

Changes in climate are being observed and these impacts are expected to continue and intensify into the future. Risk of flooding would be assessed as part of the adaptation design.

ASSESS CLIMATE RISK

Energy Demand & Waste Materials – Construction

Energy demand of the construction process includes production and removal of waste generated on site.

Energy Demand – Occupied Building

Energy demand of the occupied apartments can contribute to the climate change as at present majority of generated energy comes from carbon-based fuels. Carbon footprint of the occupiers can be based on the commuting and consumption patterns.

Flood Risk

Extreme weather patterns can pose higher risk of flooding which can cause high economical damage and disruption to the community. Review of the ‘Flood Risk Management Plan for the Liffey & Dublin Bay River Basin (UOM09)’ is included in the Engineering report and it is deemed to be outside the 1000 year flood events (Zone C).

IMPACT STATEMENT - ADAPTATION OPTIONS

Reduce Energy Demand – Grey Actions for the Occupied Building

The development design includes measures to reduce carbon footprint of the building. High level of insulation and high-performance glazing will reduce the heating demand on the plant and on site produced renewable energy will further decrease the energy demand. Chapter 5

provides description of Energy & Sustainability which serve as the Grey actions to reduce the energy requirements of the building.

As part of the design process IS 399 was used to review the energy efficient design and to include the energy design.

Behavioural Measures – Soft Actions for the Occupied Building

The way people use energy in the home, at work and in commuting between the two places, has the potential to save up to 20% of total energy consumption.

Many Irish households are unaware of the large ecological footprint that they have on the environment and how to easily save resources and prevent waste. Soft actions will aim to inform the building occupants on effective strategies to use less resources, efficient appliances, efficient use of their heating/hot water controls and efficient transport/commuting.

Reduce Energy Demand – Grey & Soft Actions during Construction

This is covered by the document 'DRAFT CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN' which is included in this planning application. This document is intended to set a clear path and philosophy for the future nominated contractor in drawing up their own final strategy for Construction and Demolition Waste Management Plan.

Flood Risk

The site is deemed to be within Flood Zone C, i.e. outside the 1000 year flood events. The sequential approach recommended by "The Planning System and Flood Risk Management Guidelines for Planning Authorities" has been complied with for the subject site as it is within Flood Zone C.

IMPLEMENT, EVALUATE & REVIEW

The adaptation options outlined above should be implemented by the main contractor and after building handover by future management company. The management company will be responsible to develop a final implementation plan, a monitoring routine and a schedule of evaluation and review.

5. SUSTAINABILITY & ENERGY STATEMENT

The location of the proposed development close to public transport routes will ensure good connectivity. Its location in walking distance to Ballyogan Wood luas station and Bus Routes serving the area.

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 solar 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 triple glass in the windows.
- High levels of insulation
- A+ Low energy LED lighting throughout the development.
- High levels of air-tightness of the dwellings.
- High efficiency centralised plant serving heating and hot water requirements

WINDOWS AND BUILDING FABRIC

All windows shall be triple glazed windows with a combined thermal transmittance not greater than 1.0W/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
Flat Roof	0.2 W/m ² K	0.2 W/m ² K
External Windows & Doors	1.0 W/m ² K	1.4 W/m ² K

THERMAL BRIDGING ACCEPTABLE CONSTRUCTION DETAILS

Building Regulations TGD L Appendix D is defining 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 $\gamma = 0.08$ W/m²K 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.

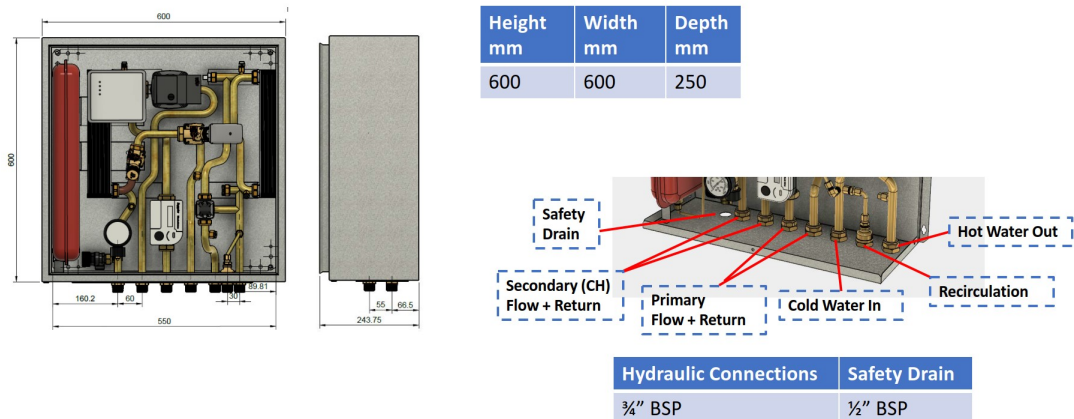
AIR PERMEABILITY

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 ‘

HEAT INTERFACE UNIT

Each apartment will be fitted with a Heat Interface Unit (HIU) which shall be wall mounted and designed to provide indirect space heating and Instantaneous DHW. The HIU has compact dimensions and greatly reduces the area required for plant within the apartments. Each unit contains an ultrasonic heat meter to fitted with MBUS communications which will be linked back to plantroom and provide a record of heat and hot water used by the occupier for purpose of billing.



Heat Interface Unit (HIU)

CENTRALISED PLANT

Part L renewable energy compliance shall be achieved by implementing of high efficiency centralised heating system. The Part L renewable contribution shall be covered by the use of heat pumps and PV panels. High efficiency gas boilers will be incorporated into the system. A space allowance analysis has been carried out to ensure adequate plant space is provided to facilitate Plant & Equipment and sufficiently sized services risers are provided.

All pumps serving the plant to be A rated energy efficiency. Advanced Building Energy Management system will control the plant to ensure its operation to maximum efficiency.

We have liaised with Gas Networks representative and they have confirmed there is 125 PE 4 BAR Gas Main available adjacent to the site.

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 the demand controlled ventilation system will serve each unit to provide high indoor air quality for the occupants.

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.

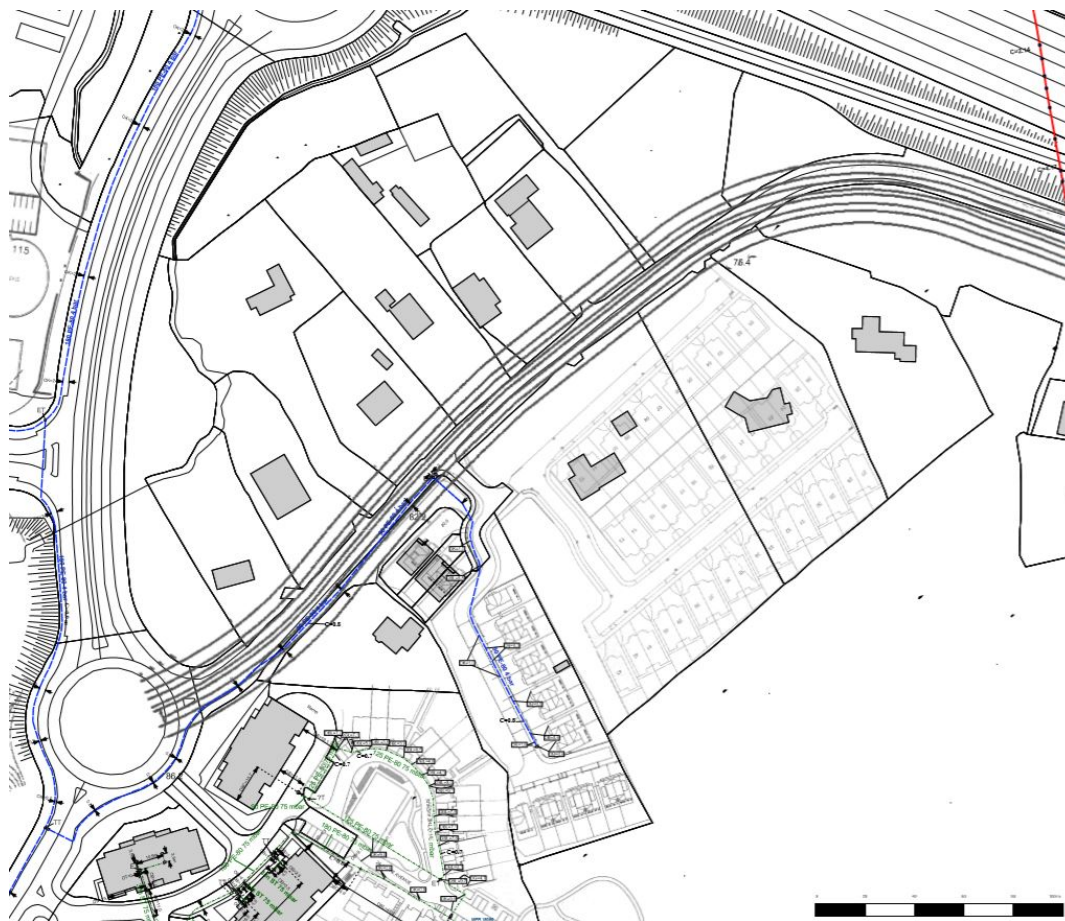
COMMUNAL AREAS

160 no. Photovoltaics are being provided to the Roof levels of Blocks A, C and D to achieve the renewable contribution to the common areas of the development.

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 3 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.



Existing Gas Networks Infrastructure

Gas networks will provide design based on detailed load analysis by building services engineer. Centralised metering will be provided to cater for the plant and possible commercial use.



Existing EIR Infrastructure



Existing Virgin Media Infrastructure

Following connection application EIR and Virgin Media will determine best connection points to serve all blocks and commercial units. Within the development, underground carpark service routes will be utilized to link to the risers.



Existing ESB Infrastructure

We have engaged with ESB to ensure there is enough capacity to serve the development. Based on the number of numbers of residential and commercial units the architectural layouts now include locations of 3 no. substations. Once the project moves to the next stage ESB will determine best routes to the substations. Within the development underground carpark service routes will be utilized to link to the risers



Ground floor plan indicating ESB Substation locations

All the parking spaces shall have ducting provision to allow for car charging point at any point in the future. There also be provision for a number of car charging points for the on street parking places.

7. TELECOMMUNICATION CHANNELS INFRASTRUCTURE

Carterhouse Consultants have engaged with microwave telecoms links provider in the area to ensure the retention of existing telecommunication channels. Where the proposed development will be in a way of such links provision will be made for diversion of these.

Carterhouse have completed a report 'Golf Lane Telecommunications Assessment'. The report concludes that there shall be a minor impact for both Vodafone and EIR which consists of one blocked link per operator. Three's network shall not be impacted.

The proposed residential development at Golf Lane, shall not cause meaningful disruption to microwave link connectivity between nearby telecommunications base stations. Where disruption occurs, its effects shall be minor and may be rectified at negligible cost.