JAK
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 & ENERGY STATEMENT

FOR

PROPOSED RESIDENTIAL DEVELOPMENT

AT

STEEPLES ROAD, DULEEK, Co. MEATH

FOR

DAVY TARGET INVESTMENTS ICAV

Project Reference:	J596
Revision Ref:	0
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Prepared By:	Jonathan Kirwan & Martin Obst

CONTENT

1. INTRODUCTION

Davy Target Investments ICAV, intends to apply to An Bord Pleanála for permission for a strategic housing development on a site area of 4.8ha located at The Steeples Road, Duleek, Co. Meath in the townland of Commons. To the north-west of the site is the Stoneyford Green residential estate, to the west, on the opposite side of Steeples Road, is The Steeples residential estate, with Larrix Mews to the east.

The proposed development will consist of 167 no. dwellings and a 2 storey creche (415sq.m). The residential dwellings will be comprised of 93 no. 2 storey houses and 74 no. duplex units & apartments accommodated in 5 no. 3 storey blocks. The proposed development consists of 8 no. 3 & 4 bed detached houses, 38 no. 3 & 4 bed semi-detached houses, 47 no. 3 & 4 bed terraced houses, and 74 no. 1 & 2 bed ground floor apartments with 3 bed duplex units overhead.

The proposed development provides for all associated site development works, including the provision of a roadside footpath and cyclepath along The Steeples Road, 2 no. ESB sub-stations, car parking, bin & bicycle storage, public open spaces, hard and soft landscaping, boundary treatments and public lighting. Access to the development will be via one new vehicular entrance off The Steeples Road.

The purpose of this report is to outline and to confirm that the proposed dwellings and Creche Facility in the development will be built in compliance with NZEB requirements as per the new Part L Dwellings (2019) and Part L (Buildings other than Dwellings (2020).
The compliance is assessed using the upgraded Domestic Energy Assessment Procedure (DEAP Version 4.2.1)

The first phase of the mixed development is proposed to include for the provision of all housing units and Creche Facilities.
The second phase of the development is proposed to include for the provision of combined Duplex units over ground floor Apartments.

The location of the proposed development close to the R150 will ensure good connectivity. The Development is in walking distance of Duleek Village and Bus Routes serving the area.

2. EXECUTIVE SUMMARY

The proposed development, whose proposed main entrance will face an existing housing estate (The Steeples, Balsaran, Duleek, Co. Meath) and together with its density and layout, will promote the efficient use of land and of energy. Its location in relation to public transport will also reduce greenhouse gas emissions.

Both the residential units and Creche Facility 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 houses and Creche Facility 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 house and Creche Facility serving both heating and hot water.

Commercial units (Creche Facility) will have building fabric U value levels in compliance with Part L 2020 (Other than Dwelling) and shall be fitted as shell and core only. Future tenant of the Creche Facility 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 relevant to housing was issued in draft format for public consultation and is yet to be finalised. Once released this document shall be the new standard for dwelling constructed after October 2019.

The new part L (2020) of building regulations relevant to buildings, other than housing comes into effect on 9th March 2020 and will be applicable to this application.

The Part L 2019 (Housing) and Part L 2020 (Other than Housing) 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.

The Part L 2019 (Housing) and Part L 2020 (Other than Housing) introduces Renewable Energy Ratio (RER), the ratio of the primary energy from renewable energy sources to total primary energy as defined and calculated in DEAP. This is replacing Part L 2011 Renewable contribution.

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EPC & CPC

In order to achieve the acceptable primary energy consumption rates for a nearly zero energy dwelling and Creche Facility, the calculated energy performance coefficient (EPC) of both the dwelling and Creche Facility 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. The MPEPC for a nearly zero energy (other than dwelling) is 1.0.

To demonstrate that an acceptable CO2 emission rate has been achieved for a nearly zero energy dwelling/Creche Facility, the calculated carbon performance coefficient (CPC) of the dwelling/Creche Facility 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. The MPCPC for a nearly zero energy (other than dwelling) is 1.15.

4. SUSTAINABILITY & ENERGY STATEMENT

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

To reduce energy demand of the dwellings/apartments and Creche Facility, the units 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 and Creche facility occurring throughout the development to ensure compliance with the building regulations and requirements of the local authority.

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 airtightness 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 1.0W/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	0.12 W/m²K	0.18 W/m²K
External Wall	0.18 W/m²K	0.18 W/m²K
Pitched Roof	0.14 W/m²K	0.16 W/m²K
Flat Roof	0.2 W/m²K	0.2 W/m²K
External Windows & Doors	1.0 W/m²K	1.4 W/m²K

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 y = 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 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 also 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 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 0.25 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 e.g. 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 e.g. NSAI certified or equivalent.

ENERGY SAVING LIGHTING

The new DEAP requires a detailed design of lighting for each dwelling/apartment and the Creche Facility. 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.

5. INFRASTRUCTURE

Other than Gas, the proposed site location is currently serviced well by Electricity, Water and Communications (Eir only, not Virgin Media). Virgin Media has highly recommended that there is provision for an additional parallel duct route installed for future connectivity for this development, which we have included for in the design.

We have explored utilities which are in immediate proximity to the site & reviewed specific service diversions, service routes and capacities to the site. The appended drawing J596(6-)05 indicates current and future infrastructure.

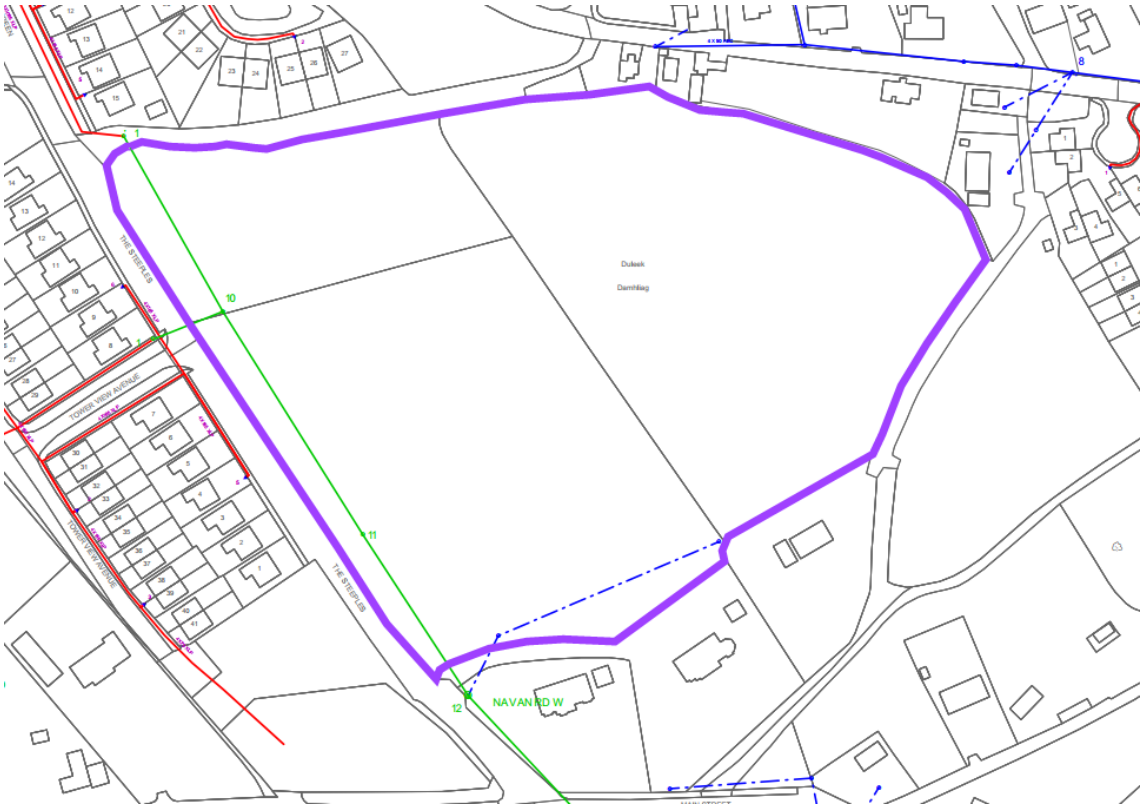

Fig.1: Existing ESB Networks Infrastructure

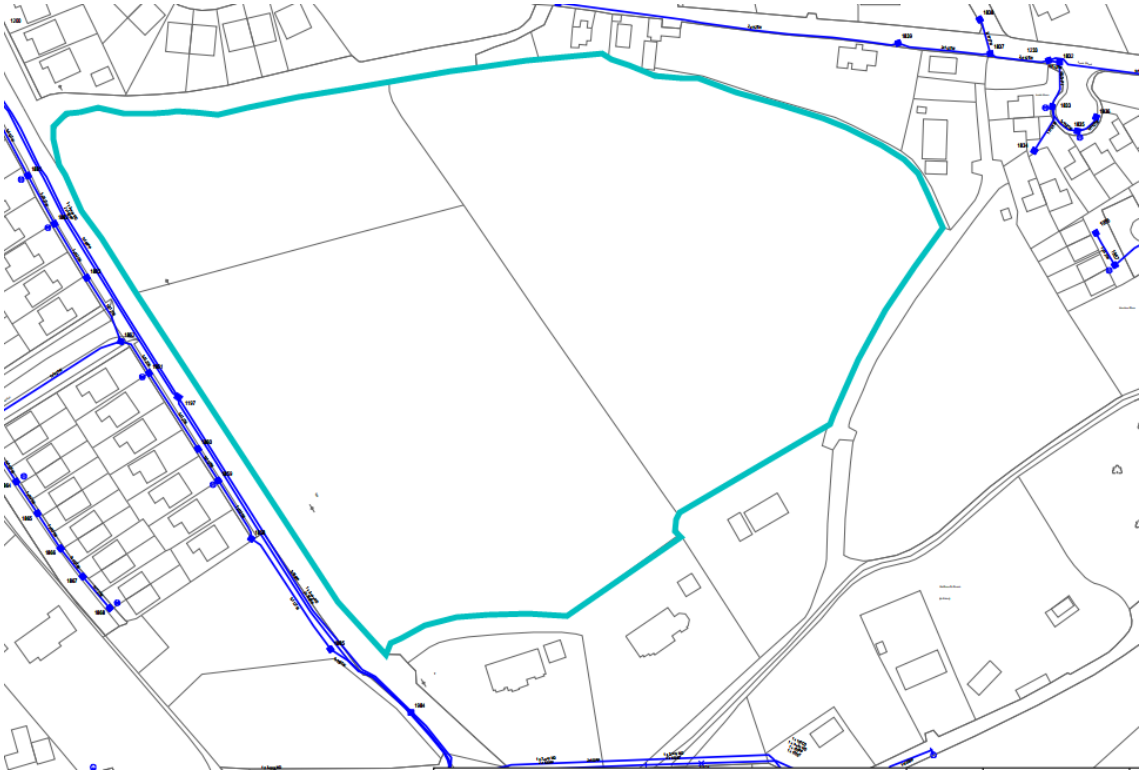

Fig. 2: Existing Eir Networks Infrastructure