KINGSBRIDGE CONSULTANCY LTD,

HAGGARDSTOWN, BLACKROCK, DUNDALK, CO. LOUTH

STRATEGIC HOUSING DEVELOPMENT (SHD) PLANNING APPLICATION

MEP DESIGN STATEMENT

10th June 2019 – Rev 4

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1 INTRODUCTION

Caldwell Consulting have been instructed to provide a MEP Design statement in relation to the plant equipment and systems being considered as an integral part of the MEP Services installation to be provided and installed at Haggardstown, Blackrock, Dundalk, Co. Louth, which comprises of 258 dwellings, semi-detached dwellings, Terraced, Duplexes, 12 no. ground floor apartments below duplexes and 213 Apartments and a Creche and is located within the administrative area of Louth County Council and is therefore subject to the land use policies and objectives of the County Development Plan 2015-2021.

https://www.louthcoco.ie/en/Publications/Development-Plans/Louth-County-Council-Development-Plans/Louth-County-Development-Plan-2015-2021.html

The area in the immediate vicinity of the site comprises of a large industrial park, Dundalk Golf Club, residential properties and rural agricultural land.

2 UTILITIES

2.1 ELECTRICITY (ESB Networks)

A recent electrical enquiry was made regarding the location of existing ESB electrical network and equipment within the immediate vicinity of the site. Image 2.1A below indicates the approximate location of ESB underground (UG) cables and overhead (OH) lines.

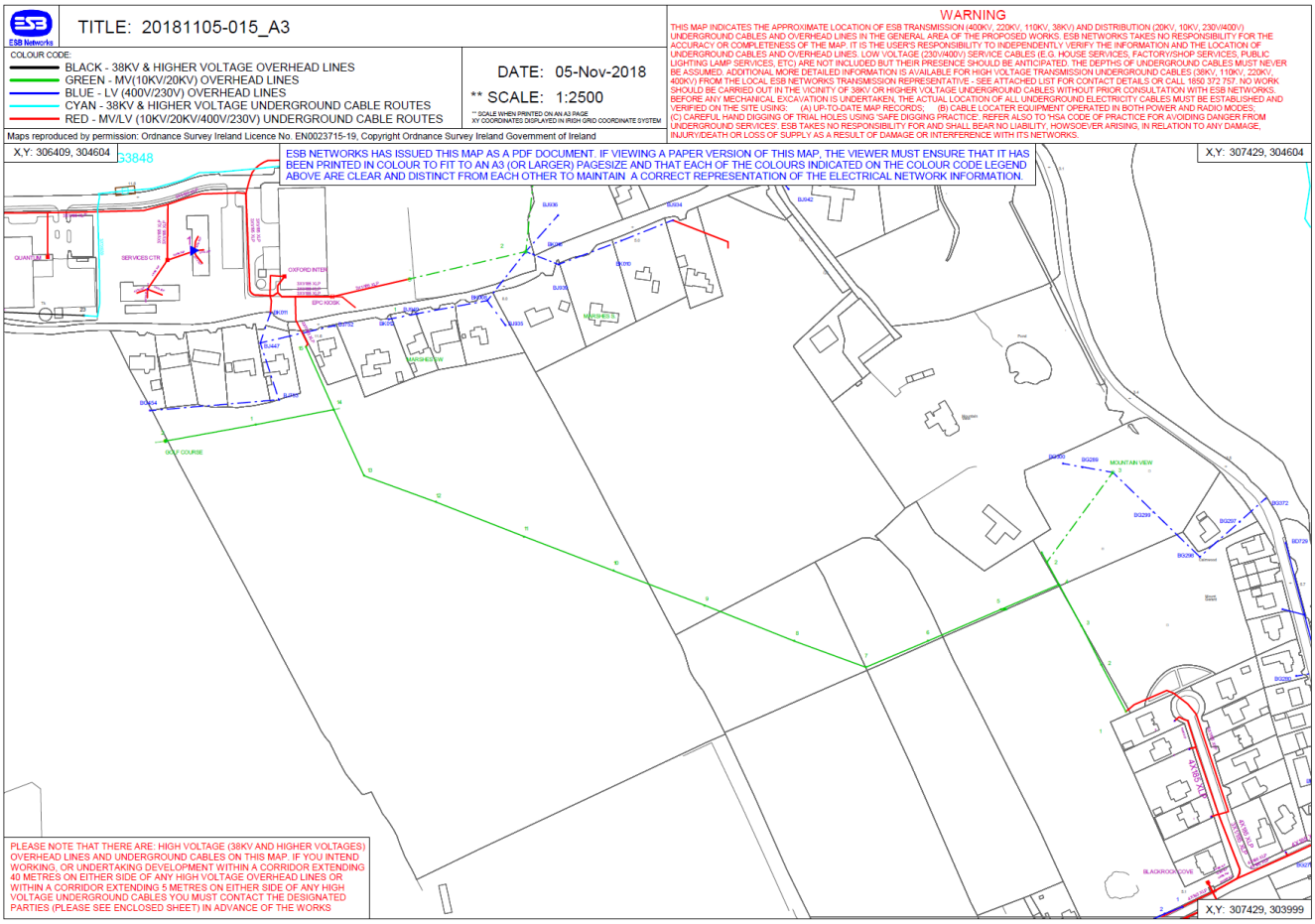


Image 2.1A – ESB Map indicating approximate locations of utility providers equipment

It is noted that ESB Networks currently indicate LV overhead lines (Indicated by dark dashed Blue lines) adjacent to the Bothar Maol road, these appear to be serving the residential properties within this Cul-De-Sac. The large industrial park North of the proposed development site appears to have an underground MV/LV network infrastructure (Indicated by both Red and Cyan lines) which is currently linked to an ESB MV post reference number 15 overhead line located within the vicinity of the proposed Cycle/pedestrian route at the North of the site.

The proposed residential development site has existing ESB poles installed throughout the site area including crossing the entrance of the site at R172 Blackrock Road. The Medium Voltage (MV - 10K/20KV)

and Low Voltage (LV – 400V/230V) overhead lines will either need to be switchout or a diversion implemented, subject to approval by the utility provider.

Image 2.1B – ESB overhead lines located within the vicinity of the proposed Cycle/pedestrian route at the North of the site.

As raised prior, there are high voltage underground and Medium Voltage overhead lines in the development area concerned and in accordance with ESB terms and conditions, that if development is intending to be undertaken within a 80 meter corridor of this infrastructure, the developer must immediately contact the local Transmission representative to agree safe working procedures and necessary clearances between the lines and the development in advance of any excavation. The contact name and number for the Transmission representative within this area is Mr Peter Kirk, Avenue Road, Dundalk, 087-2225491.

Provision for 6 No 125mm red MV ducts will be considered at the entrance to the site. The main entrance to the development is proposed as being from the R172 Blackrock Road to the East of the site.

ESB services will be extended from the site entrance and will terminate in each ESB sub-station within the development. It is envisaged that 2 No. ESB Sub-stations will be required to serve the development. The final locations of these Sub-stations and its duct work installation will be subject to design approval by ESB new connections department and planning with consideration taken to centrally located substation positions to limit ESB cable runs.

Services to each individual dwelling will be from a local min-pillar, with 1No. mini-pillar typically expected to serve 10 No. dwellings. Final quantity and location of these mini-pillars will be subject to new connections department and planning approval.

ESB services will terminate within the metering cabinet positioned on the external wall of each detached dwelling, semi-detached dwelling, Terraced and an agreed house services meter location for the duplexes and apartments.

2.2 GAS (GAS NETWORKS IRELAND)

There is an existing Gas Network Ireland distribution medium pressure pipework (Indicated with a blue line) along in the vicinity of the development. Image 2.2A below indicates a 63 PE-80 4 bar medium pressure distribution pipe installed at Bothar Maol road. A 63 PE-80 4 bar medium pressure distribution pipe also appears to be serving a domestic dwelling at the East of the site given the impression that Gas Networks Ireland are also located on the R172 Blackrock Road, however this is not clear due to the positioning of the Notice on the map.

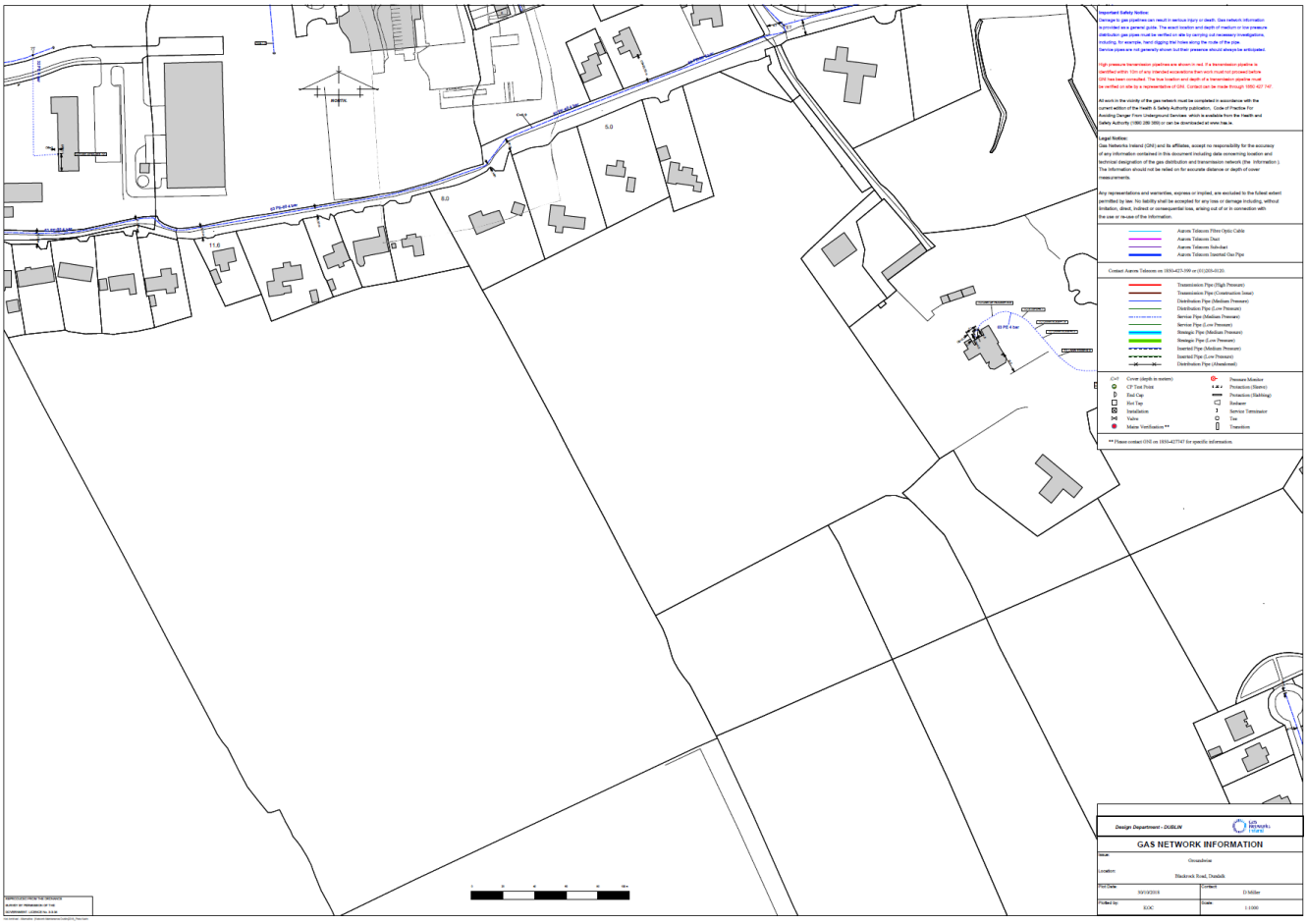


Image 2.2A – Gas Networks Ireland Map indicating approximate locations of utility providers equipment

The proposal would be for a connection to be installed from the existing gas main to the development entrance, located on the R172 Blackrock Road to the East of the site and then capped at this point, subject to approval by the utility provider.

2.3 OPEN EIR

As per image 2.3A below, the proposed development site appears to have an EIR network installation within the vicinity. This is currently indicated at the East of the site given the impression that EIR networks are located on the R172 Blackrock Road, however the complete route is not clear on the map.

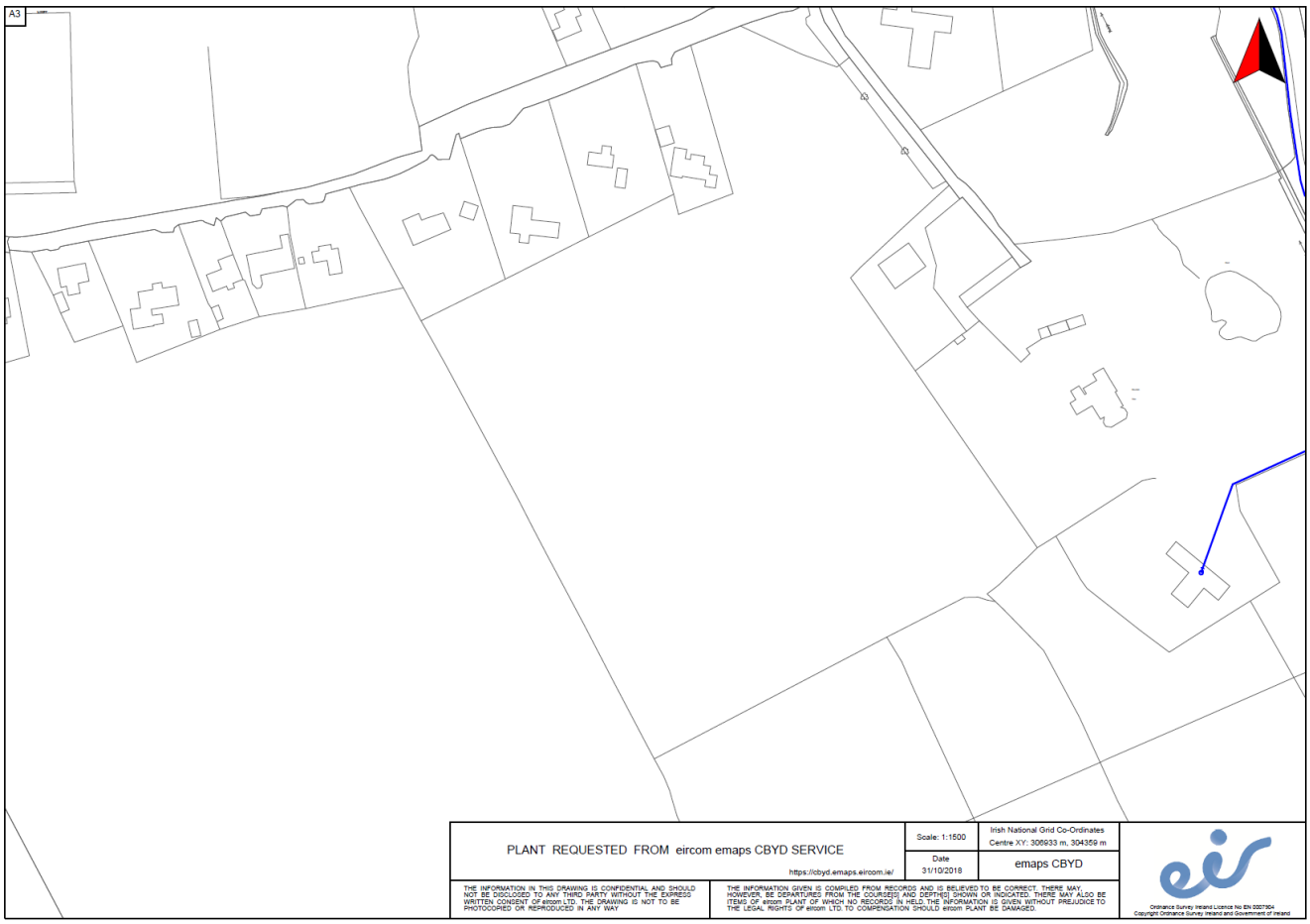


Image 2.3A – EIR Networks Map indicating approximate locations of utility providers equipment

The proposal would be to install 4No. 100mm dia. communication ducts, these ducts would be located at the site entrance and will be distributed throughout the development.

It is envisaged that EIR services will comprise of JB4 chambers and ducting with final locations and routes subject to utility design. All chambers will be suitably traffic rated for the area in which they are being installed.

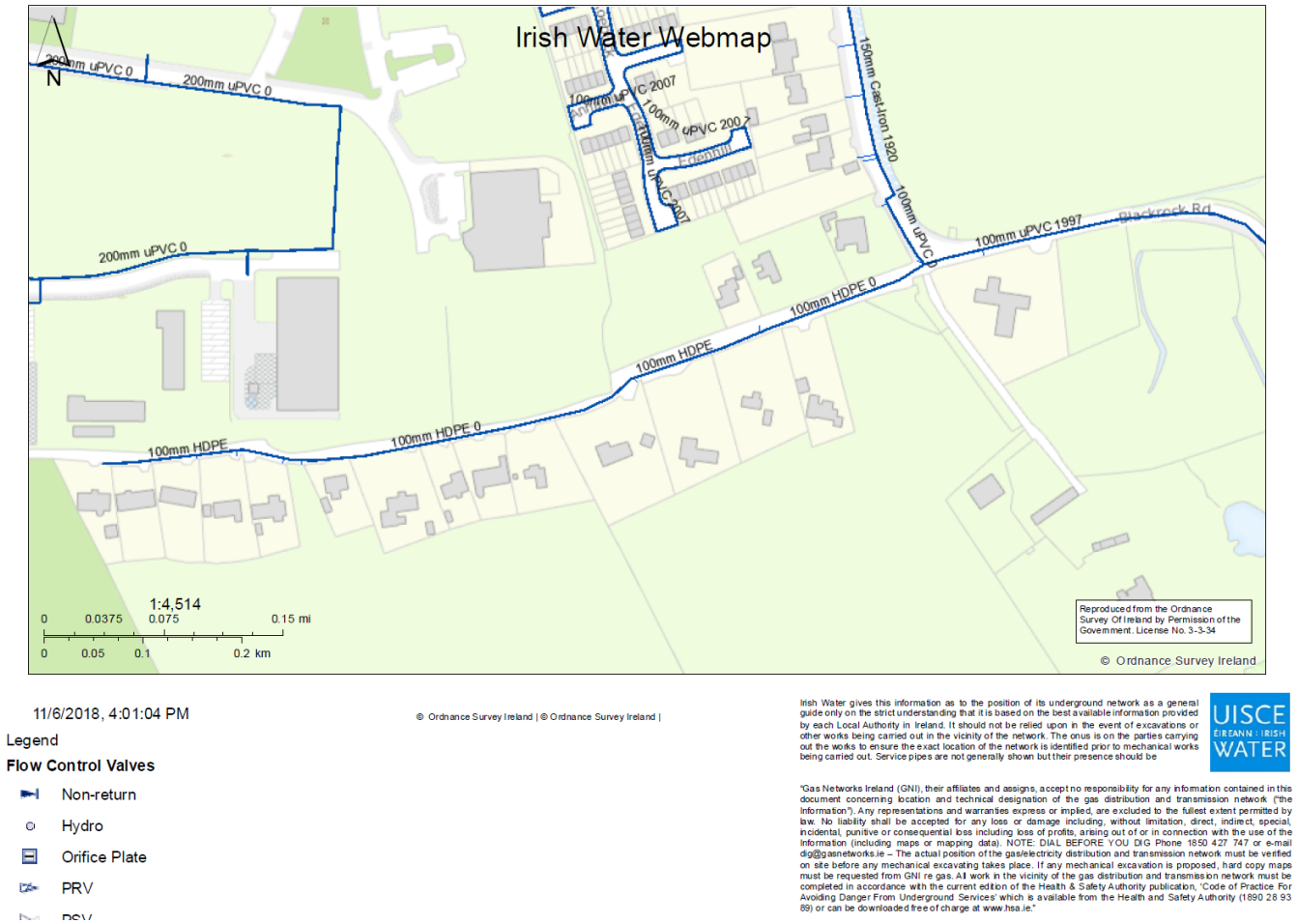
As per other residential developments which we have been involved, an EIR network duct installation would be installed from the nearest chamber to each dwelling, with an expected maximum 12No dwellings served from any one chamber.

EIR services will then terminate within an EIR ETU box which is normally positioned on the external wall of the dwelling.

In relation to the apartment blocks, EIR's network installation will terminate within an EIR cabinet(s) located within a secure area on the ground floor. EIR services will then be extended and terminated within the EIR distribution unit and distributed to each apartment. Final design and conditions are to be agreed with EIR utility provider.

2.4 WATER (IRISH WATER)

There is an existing Irish Water underground network (Indicated with a blue line) along in the vicinity of the development. Image 2.4A below appears to indicate the Irish water network traveling along the R172 Blackrock Road via 150mm Cast Iron and a 100mm UPVC network and then banching to neighbouring dwellings and developments via a 100mm High Density Polyethylene (HDPE) installation along the Bothar Maol road at the North end of the development site.



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Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland. It should not be relied upon in the event of excavations or other works being carried out in the vicinity of the network. The onus is on the parties carrying out the works to ensure the exact location of the network is identified prior to mechanical works being carried out. Service pipes are not generally shown but their presence should be

UISCE ÉIREANN : IRISH WATER

Legend

Flow Control Valves

- Non-return
- Hydro
- Orifice Plate
- PRV

"Gas Networks Ireland (GNI), their affiliates and assigns, accept no responsibility for any information contained in this document concerning location and technical designation of the gas distribution and transmission network ("the Information"). Any representations and warranties express or implied, are excluded to the fullest extent permitted by law. No liability shall be accepted for any loss or damage including, without limitation, direct, indirect, special, incidental, punitive or consequential loss including loss of profits, arising out of or in connection with the use of the Information (including maps or mapping data). NOTE: DIAL BEFORE YOU DIG Phone 1850 427 747 or e-mail dig@gasnetworks.ie – The actual position of the gas/electricity distribution and transmission network must be verified on site before any mechanical excavating takes place. If any mechanical excavation is proposed, hard copy maps must be requested from GNI re gas. All work in the vicinity of the gas distribution and transmission network must be completed in accordance with the current edition of the Health & Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (1890 28 93 89) or can be downloaded free of charge at www.hsa.ie."

Image 2.4A – Irish Water Networks Map indicating approximate locations of utility providers equipment

The proposal would be to extent the existing Irish water network currently installed on the R172 Blackrock Road to the development entrance located at the East of the site and then cap at this point, subject to approval by the utility provider.

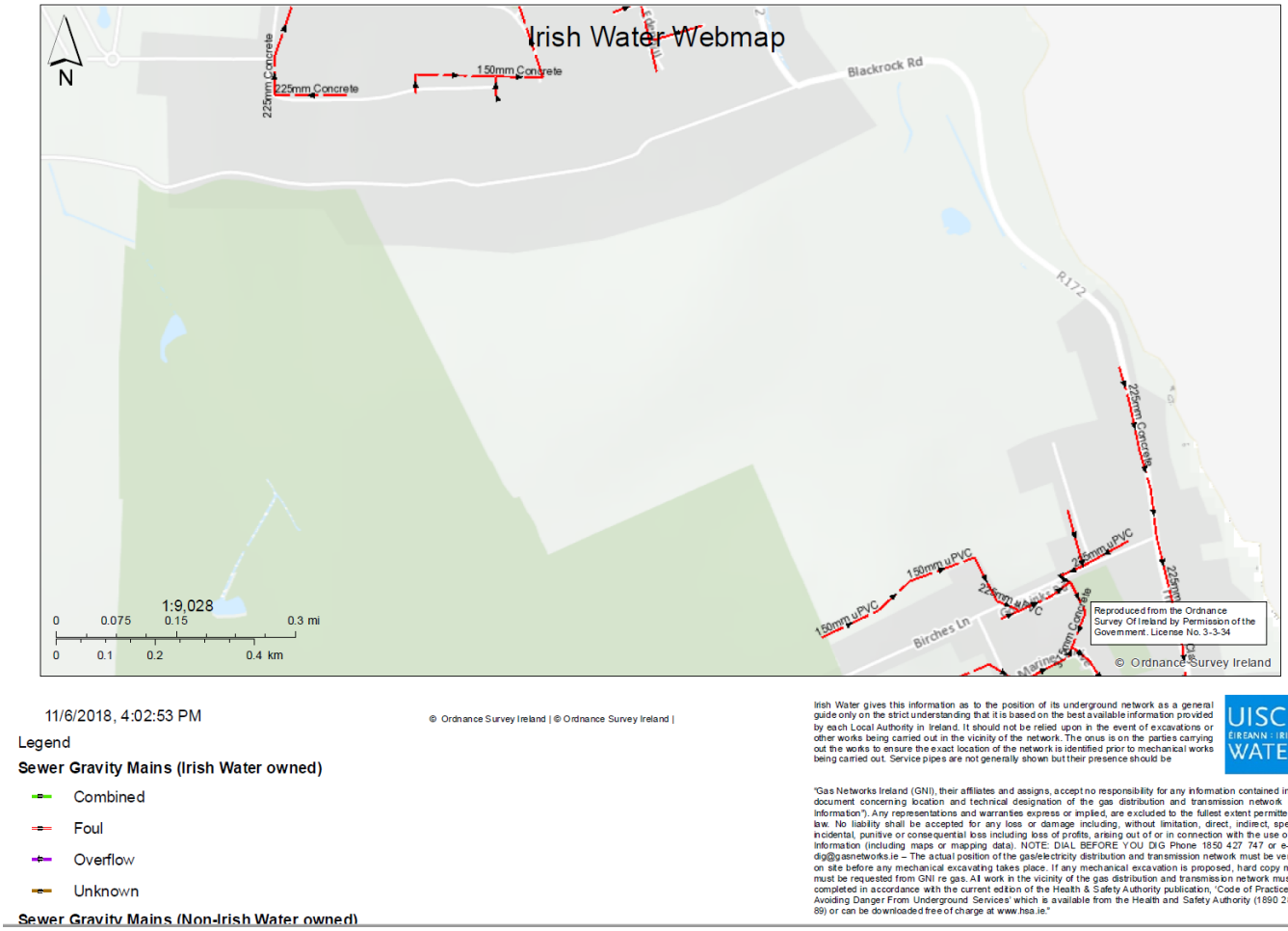

Image 2.4B – Irish Water Sewer Networks Map indicating approximate locations of utility providers equipment

As Image 2.4B above indicates, Irish Water currently as a Foul network installation within the vicinity of the development. The R172 Blackrock Road appears to have a 225mm Concrete sewer network installation which then branches to neighbouring dwellings and developments currently via 375mm Concrete network installation and a 225mm and 150mm UPVC network.

The proposal would be to extent the existing Irish water sewer network currently installed on the R172 Blackrock Road to the development entrance located at the East of the site and then cap at this point, subject to approval by the utility provider.

2.5 FOUL WATER DRAINAGE AND WASTE WATER PUMPING STATION

The proposed development will have a new foul drainage network constructed throughout, which will include 150mm and 225mm diameter gravity pipelines with manholes.

The proposed design comprises an onsite pumping station with an adjoining emergency storage tank which is capable of 12 hours of dry weather flow or 447 TS/dwelling. The waste water from the pumping station will be pumped to the public mains located at the junction of the N52 and the entrance to the Crowne Plaza Hotel and DKIT. For further design clarification, refer to Finn Design Partnership engineering and services report.

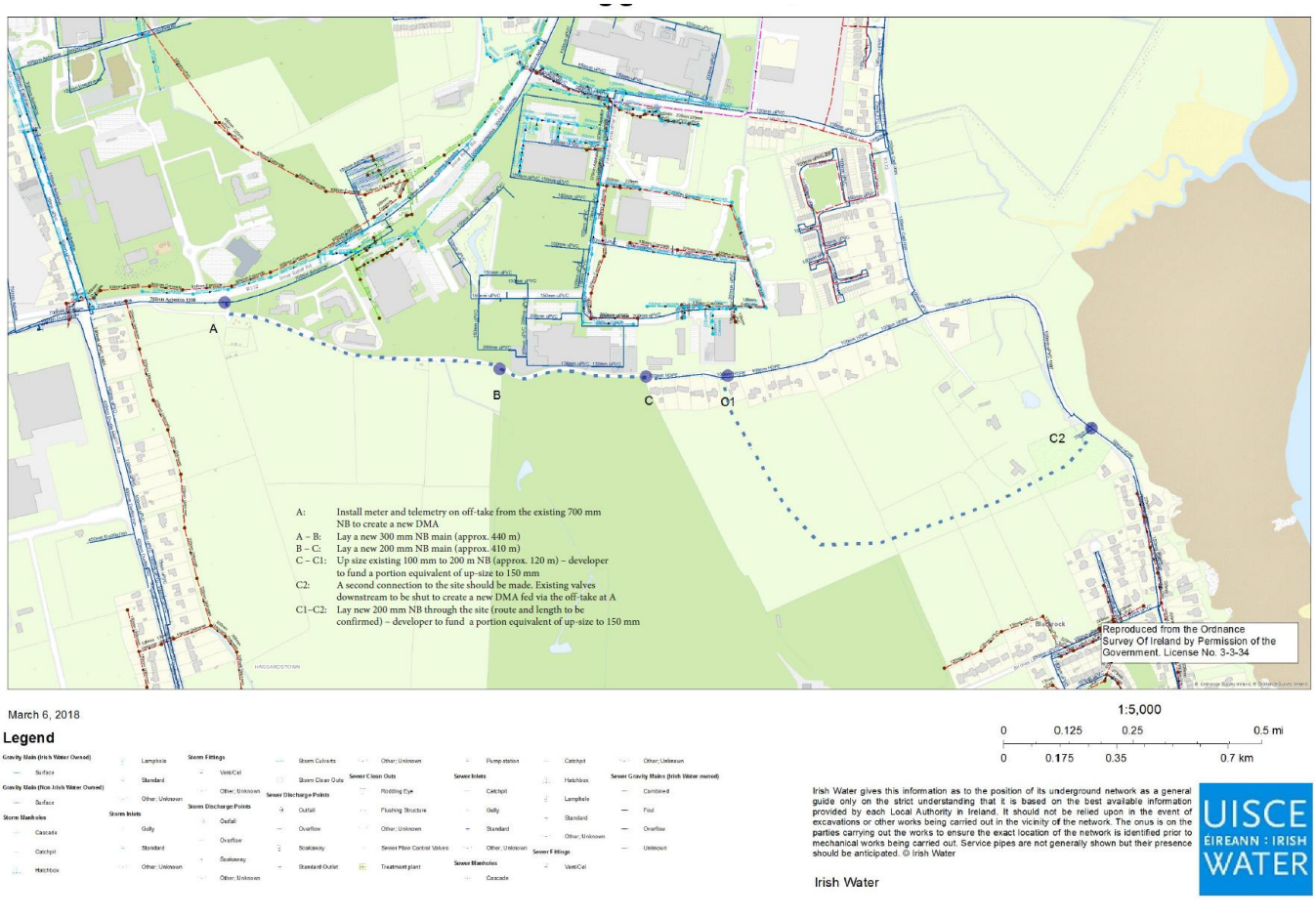

Image 2.5A – Irish Water Sewer Networks Map indicating proposed routes

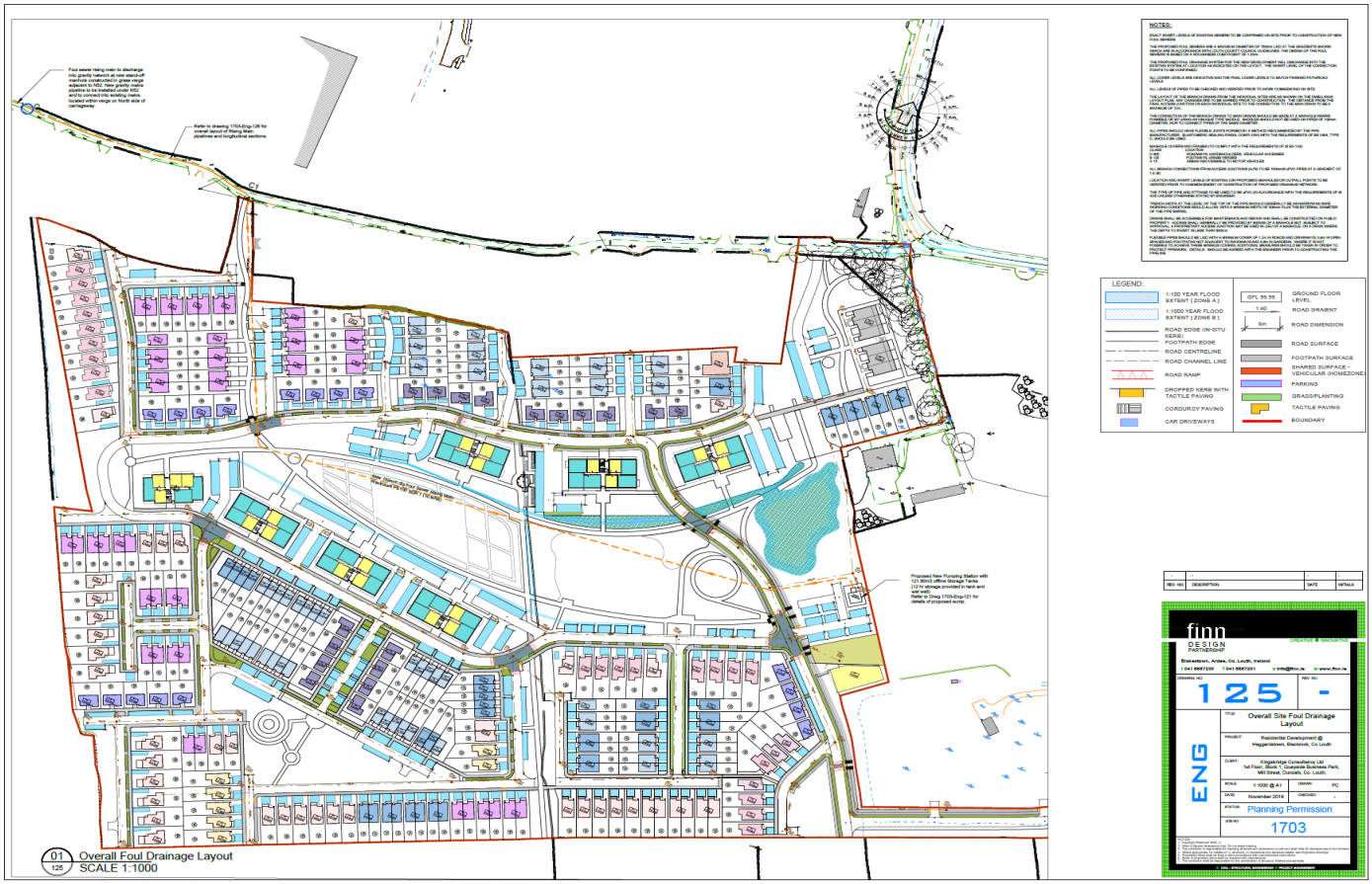

Image 2.5B – Finn Design Partnership Overall Site Foul Drainage Layout

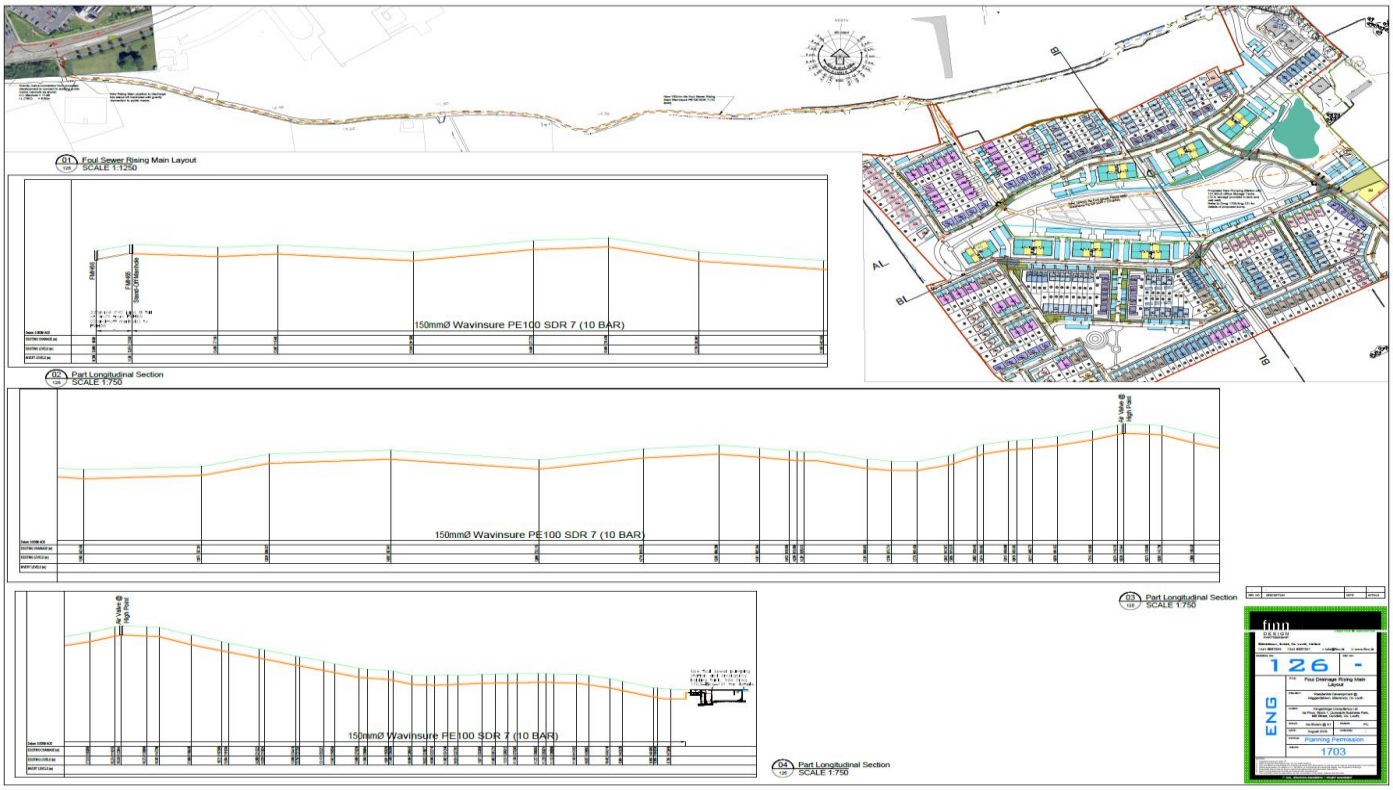

Image 2.5C – Finn Design Partnership Foul Drainage rising main layout

2.6 POTABLE WATER SUPPLY

The potable water supply for the development will be taken from the existing public mains located at the junction of the N52 and the entrance to the Crowne Plaza Hotel and DKIT. Consultations by Finn Design Partnership with Irish Water have confirmed that a new DMA will be installed where a new pipeline will be installed from the connection point and will be extended along Bothar Maol before entering and passing through the site and connecting to the existing public watermains on the R172 at the North end of Blackrock Village near the proposed entrance to the site. For further design clarification, refer to Finn Design Partnership engineering and services report.

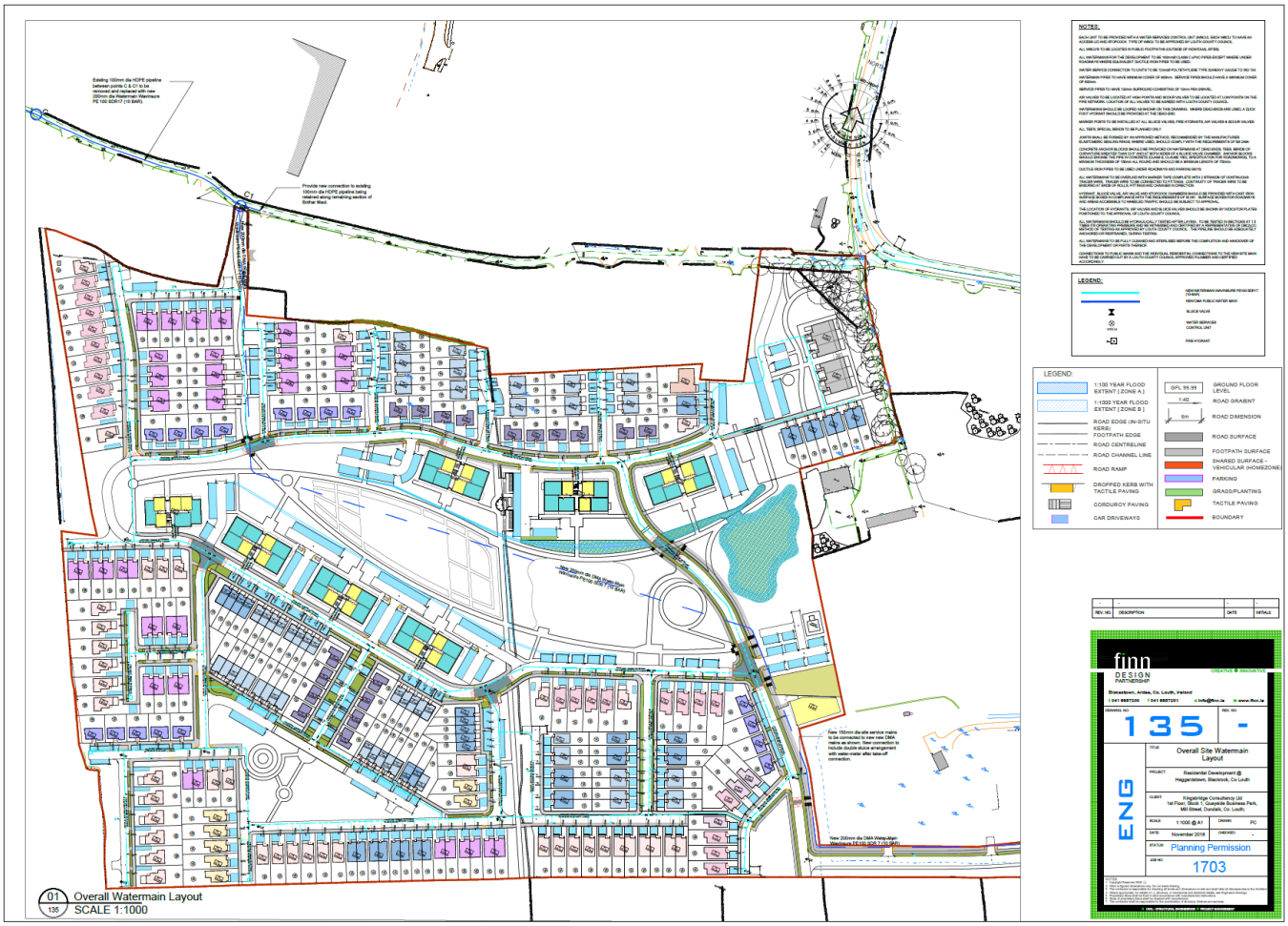

Image 2.6A – Finn Design Partnership Overall Site Watermain Layout

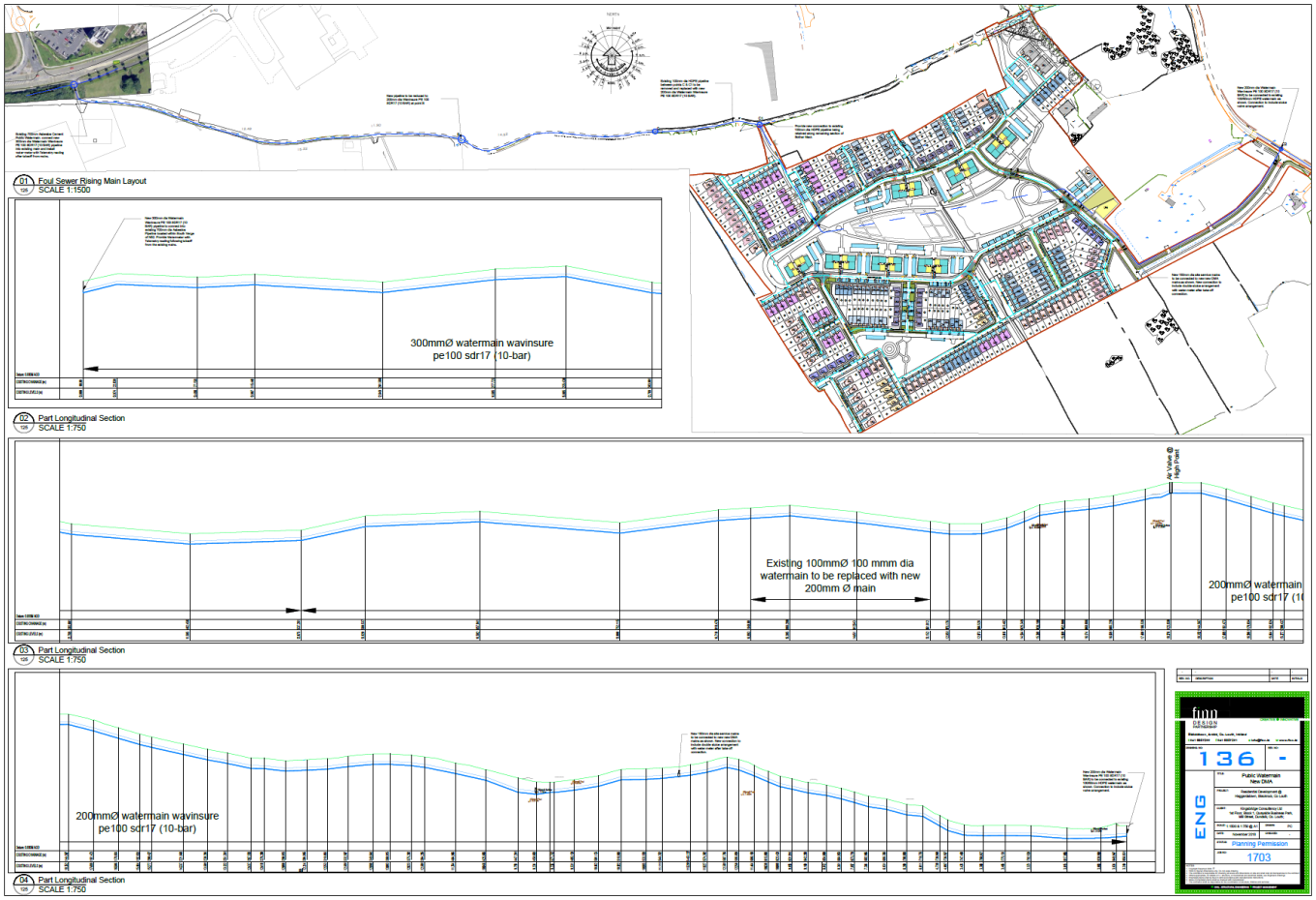

Image 2.6B – Finn Design Partnership Public Watermain Layout

2.7 STREETLIGHTING

The proposed Streetlighting has been detailed in a separate report and is summarised below.

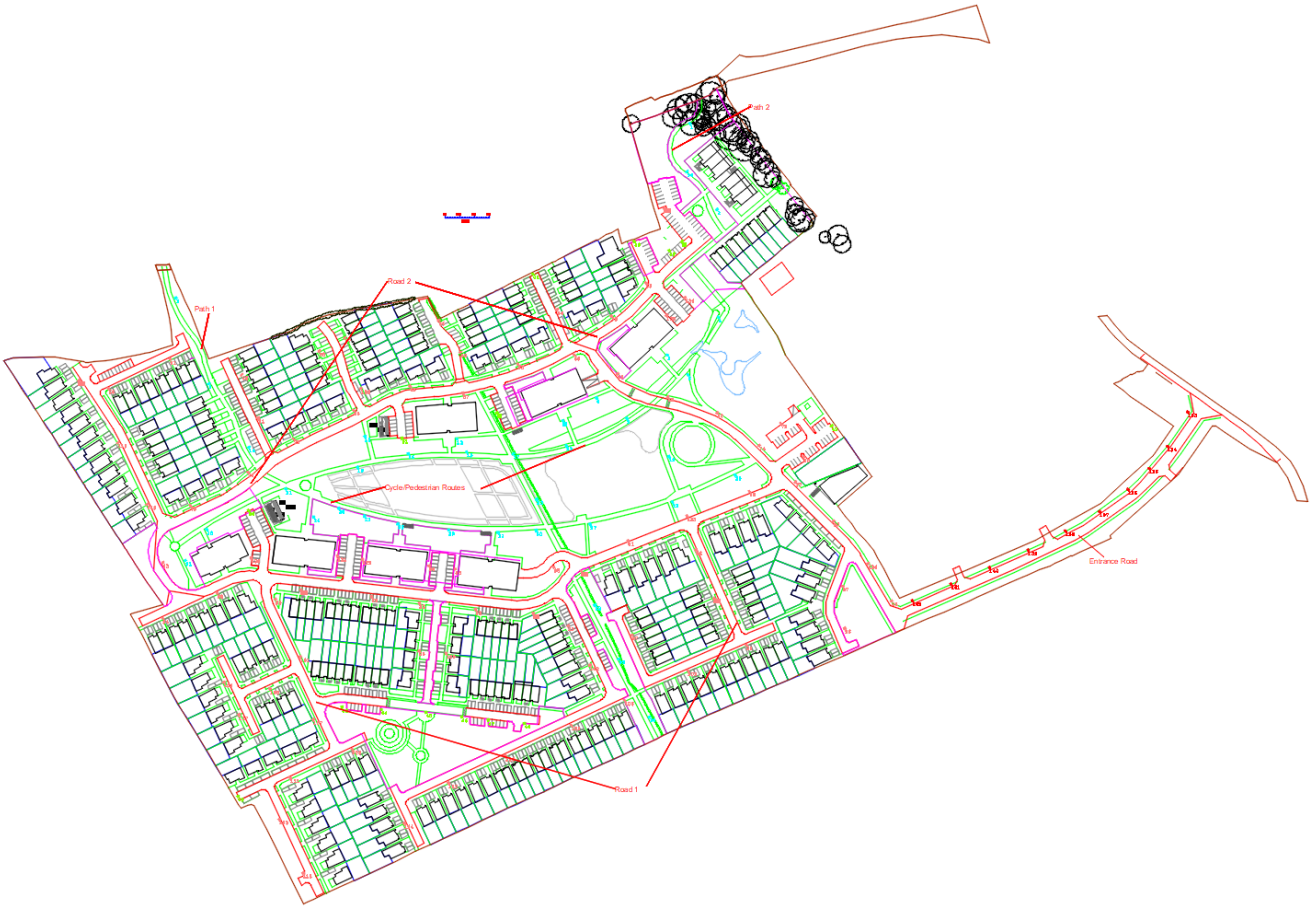

Image 2.7A – Proposed street lighting design with isoline remove for clarity

The proposed streetlighting installation for the new Residential Development at Haggardstown, Blackrock, Dundalk, Co. Louth achieves the following;

- Luminaire selection limits upward light spill and helps control minimal light spillage and glare onto site boundaries in accordance with the 'Biodiversity Chapter of the EIAR'.

- All lamps selected have a DALI driver and are dimmable. If a curfew is implemented, this will limit the amount of upward sky glow at night during a pacific time also helping to reduce running and maintenance costs

- Complies with the recommended illumination levels in accordance with relevant current regulations and standards. The light levels are as follows:

    I. Entrance Road: 9.7 lux average, with a minimum of 1.7 lux. This complies with class P2 of IS

EN 13201/BS5489 with a S/P ratio of 1.4 **(8.4 lux average, 1.7 lux minimum)**

II. Road 1: 4.5 lux average, with a minimum of 0.8 lux. This complies with class P4 of IS EN 13201/BS5489 with a S/P ratio of 1.4 **(3.8 lux average, 0.8 lux minimum)**

III. Road 2: 4.6 lux average, with a minimum of 0.8 lux. This complies with class P4 of IS EN 13201/BS5489 with a S/P ratio of 1.4 **(3.8 lux average, 0.8 lux minimum)**

IV. Cycle / Pedestrian Routes: 3.4 lux average, with a minimum of 0.4 lux. This complies with class P5 of IS EN 13201/BS5489 with a S/P ratio of 1.4 **(2.1 lux average, 0.4 lux minimum)**

V. Path 1: 2.8 lux average, with a minimum of 0.6 lux. This complies with class P5 of IS EN 13201/BS5489 with a S/P ratio of 1.4 **(2.1 lux average, 0.4 lux minimum)**

VI. Path 2: 3.2 lux average, with a minimum of 0.5 lux. This complies with class P5 of IS EN 13201/BS5489 with a S/P ratio of 1.4 **(2.1 lux average, 0.4 lux minimum)**

- Complies with Uniformity requirements throughout the development to ensure good visibility at night

The final installation will be coordinated with drop kerbs, providing access to dwellings and landscaping to ensure that lighting is not obstructed, nor does it cause a hazard to pedestrians, cyclists or road users.

2.8 SUSTAINABILITY

This section outlines the proposed energy efficiency and sustainability objectives under consideration for the development.

The options set out are all potentially viable and it is envisaged that there is sufficient flexibility in the planning assessment to allow for one of more of these options to be implemented.

The sustainable options being investigated assist in achieving reduced overall energy consumption and usage within all properties.

3 DWELLING ENERGY ASSESSMENT PROCEDURE (DEAP)

Dwelling energy Assessment Procedure (DEAP) methodology will be utilised to calculate the energy performance and associated carbon dioxide emissions for the provision of space heating, ventilation, water heating and lighting in all Dwelling types to show compliance with Part L of the Irish Building Regulations.

The DEAP models will enable and provide information on;

- expected energy consumption and associated CO2 emissions for a dwelling under standardised operating conditions
- the publication of a BER certificate indicating the rating scale based on a dwellings energy consumption per unit area

This will enable prospective Purchasers/Tenants to objectively compare the energy performance of different dwellings on a like for like basis.

4 ELECTRICAL SERVICES INSTALLATION

4.1 RENEWABLE ENERGY

Renewable energy is generated from natural resources such as the sun, wind and water. This therefore provides an alternative option to buying all or part of our energy from suppliers, by installing renewable technology also known as micro generation and low carbon technology to generate our own. The following benefits of installing a renewable technology are highlighted below

- It will help to reduce your energy bills and, in some cases, could lead to you generating income by selling any surplus energy back to your energy provider,
- Reduces your dependence on non-renewable energy,
- Makes use of secure and local resources,
- Helps to reduce your production of carbon dioxide and other greenhouse gases,
- Can help new constructions meet carbon legislation compliance,

4.1.1 MICRO-WIND TURBINES

Wind turbines are used to hardness the power of the wind, which is then converted to generate electricity. The wind turbines use large blades to catch the wind, when the wind blows the blades are forced to rotate which drives a turbine which then generates electricity. There are two types of domestic size wind turbines:

- Building mounted – These are normally smaller in size than mast mounted systems and can be installed on the roof of the home where there is a suitable wind resource. These turbines are sized between 1KW – 2KW. The main disadvantages of this renewable technology on a domestic property within a residential development is its visual look and the cost of maintenance. Maintenance checks are necessary every few years and will generally cost between 150 euro and 250 euro per year depending on the turbine size.
- Pole mounted – These are free standing wind turbines and are erected in a suitable exposed position within your property and will often come in sizes between 5KW to 6KW.

4.1.2 SOLAR PANEL ELECTRICITY SYSTEMS (PV)

Solar panel electricity systems, also known as photovoltaics (PV), are a renewable technology used to capture the suns energy using photovoltaic cells. The positive fact of these cells is that they don't need direct sunlight to operate and can still generate some electricity on a cloudy day (However the stronger the

sun shine, the more electricity is produced). The photovoltaic cells convert the sunlight into electricity, which then allows the tenant/home owner to use the generated electricity to run the household appliances and lighting. An advantage that PV panels have over domestic Micro-wind turbines discussed previously within this report is that with improving technology, the PV systems are made up of panels that can either fit on top of an existing roof or can be more discrete and can be installed as a solar tile. Solar tiles are designed to be used in place of ordinary roof tiles. However, a system made up of solar tiles will typically cost approximately twice as much as an equivalent panel system.

Another advantage of solar PV system is that they need little maintenance and typically just require the tenant/home owner to keep the panels relatively clean and make sure trees don't begin to overshadow them.

4.2 E-CAR CHARGING POINTS

Consideration has been given to the provision of E-CAR home charging points in accordance with government electric vehicle home charge schemes providing a reduction in diesel and petrol powered vehicles policy and targets.

It is anticipated that persons in dwellings owning electric vehicles will install their own charging point as and when required.

It is recommended that several E-CAR charging points are considered for installation in the vicinity of the apartment blocks with power supplies being provide from the local Landlord Services LV network and that the charging points will be maintained by a Management Company.

5 MECHANICAL SERVICES INSTALLATION

5.1 CONDENSING BOILERS

Condensing boilers have been considered, as these boilers can be fuelled by either gas or oil. They have a high operating efficiency which results in lower fuel consumption reducing energy bills and lowering greenhouse gas emissions reducing your carbon footprint. Condensing boiler manufactures claim that up to 98 thermal efficiency can be achieved, compared to 70% - 80% with conventional designs.

5.2 VENTILATION AND HEAT RECOVERY

5.2.1 NATURAL VENTILATION

Natural ventilation has been considered to minimise energy usage. This method is used to avoid installing mechanical equipment to supply air to and removing air from an indoor space within a domestic dwelling.

Natural ventilation provides less noise impact for occupants and adjacent dwellings, passive approach results in no energy usage, little maintenance and fresh air providing a healthy indoor environment.

5.2.2 MECHANICAL VENTILATION HEAT RECOVERY (MVHR)

Mechanical ventilation heat recovery systems (MVHR) has being considered as they extract warm, damp air from the property and extract fresh air from the environment. The warm, extracted air is passed through a heat exchanger to recover any available heat prior to been extracted outside. The outside air does a similar process and travels through the heat exchanger where it is prewarmed before being pumped into the domestic dwelling. The MVHR system consists of concealed ducts either located within the properties attic or floor voids and store, which provide a low energy solution for ventilation to the dwellings whilst ensuring that fresh air is continuously provided. It is noted that like most systems, MVHR installations do require regular servicing, as all equipment such as filters and fans must be kept clean to ensure effective operation.

5.2.3 EXHAUST AIR HEAT PUMPS

Exhaust air heat pumps are being considered to provide mechanical ventilation, space heating and domestic hot water. Exhaust air heat pumps provide controlled domestic ventilation and heat recovery as they extract heat from a dwelling via the ventilation system by drawing the air from Kitchens, Utility Rooms, Bathrooms and en-suites through ducts to the heat pump, which then absorbed and transfers it to the air supply, space heating and or domestic hot water. The system also captures heat generated by an individual within the dwelling, as well as heat generate during cooking, lighting and solar.

Any excess air with the heat removed is discharged to free air outside the dwelling.

5.3 AIR TO WATER HEAT PUMPS

Air to water heat pumps are being considered to provide space heating and domestic hot water. An air source heat pump is a system which transfers heat energy absorbed from the outside air in order to heat inside a dwelling. This is done via radiators, underfloor heating and domestic hot water. These systems do not require fuel storage, are easy to install and have a long lifespan (20 Years) as well as reducing your energy bills and carbon footprint. However, has noted with other renewable systems the installation will require maintenance cleaning every few months and serviced by an engineer once a year to ensure effective operation and a long-life span.

5.4 COMBINED HEAT AND POWER (CHP)

A Combined heat and power system (CHP) are being considered to generate electricity and thermal energy. This technology harnesses wasted energy and utilises a larger percentage of energy stored in the fuel to produce heating, hot water and electricity for the home. The system can offer both financial and environmental benefits reducing the homes energy costs and CO2 emissions and can help with new constructions meet carbon legislation compliance.

5.5 ELEMENTAL U-VALUES AND AIR INFILTRATION

Lower U-values and improved air tightness will minimise heat losses through the building fabric, reducing energy consumption thereby reducing emissions.

U-values being evaluated will need to comply as a minimum, in accordance with those required by the Technical Guidance Documents Part L 'Conservation of Fuel and Energy in Dwellings'. This government document applies to dwellings, both new and existing and provides guidance on the materials, methods of construction, standards and technical specifications.

Thermal bridging at junctions between construction elements and at other locations will be minimised in accordance with paragraphs 1.3.3, 1.5.3, 2.1.3 and appendices D of the Technical Guidance Documents Part L 'Conservation of Fuel and Energy in Dwellings'.

6.0 SUMMARY

Based on recent utility survey enquires, records indicate that there is sufficient utility infrastructure within the vicinity of the development proposed at Haggardstown, Blackrock, Dundalk, Co. Louth.

The proposed residential development site does have existing ESB poles installed throughout the site area including crossing the entrance of the site at R172 Blackrock Road. The Medium Voltage (MV - 10K/20KV) and Low Voltage (LV – 400V/230V) overhead lines will either need to be switchout or a diversion implemented, subject to approval by the utility provider.

The proposed streetlighting installation summarised in this report and detailed in a separate report offers Luminaire selection which limits upward light spillage and glare onto site boundaries in accordance with the 'Biodiversity Chapter of the EIAR', has the ability to be dimmable and Complies with the recommended illumination levels and Uniformity requirements in accordance with relevant current regulations and standards.

The energy efficiency options summarised within this report have all being evaluated at present and will be assessed and confirmed at detailed design stage. Each system potential offering either/both financial and environmental benefits reducing the homes energy costs and CO2 emissions in addition to supporting new constructions with meeting carbon legislation compliance.