

Project:

Large-scale Residential Development at Caheranardrish, Limerick, Co. Limerick

Report Title

Engineering Services Report

Document Reference

24051-OSL-00-RP-C-0001



Civil, Structural & Project Engineering Services
Unit 38 Eastgate Drive, Little Island, Cork T45 YO49

APRIL 2026

Document Control

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Client	Homeland Projects Ltd.				
Document Title	Engineering Services Report				
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P01	S2 – For Information	30/09/25	For Information	BJM	DB	DB
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P03	S2 – For Information	06/03/26	For Review	BJM	DB	DB
P04	S2 – For Information	03/04/26	For Planning	BJM	DB	DB

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1.0 INTRODUCTION

OSL Butler Consulting Engineers (OSL) has prepared this Engineering Services Report on behalf of Homeland Projects Ltd., for a proposed Large-Scale Residential Development at Caheranardish, Limerick, County Limerick on a circa 6-hectare site.

The site is located to the southwest of Limerick City, centred at grid reference E: 553437.955, N: 653504.924 (ITM) as highlighted in Figure 1 below.

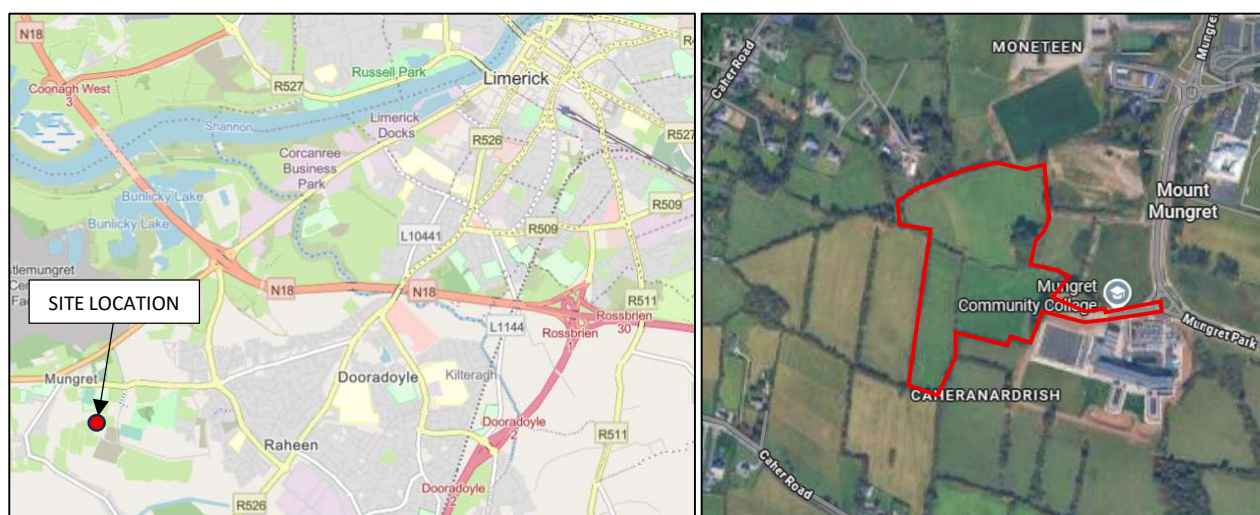


Figure 1: Site Location (Site boundary shown indicatively)

The lands are bound to the north by Mungret St Pauls GAA, to the west, east and south by existing agricultural land and to the southeast by the existing Mungret Community College.

The development will consist of a Large-scale Residential Development (LRD), comprising of 182no. residential dwellings as follows: 141no. houses consisting of 104no. detached/semi-detached dwellings (24no. 4-beds, 78no. 3-beds and 2no. 2-beds), 37no. townhouses (18no. 3-beds and 19no. 2-beds) and 41no. apartment units across 1no. triplex unit (2no. 2-beds and 1no. 1-bed) and a five-storey apartment building (13no. 2-beds and 25no. 1-beds) with a crèche with capacity to accommodate 70no. children at ground floor level.

The proposed development will include the provision for car parking, including EV charging points and bicycle parking. The proposed development will also include the provision of private, communal, and public open spaces; internal roads and pathways; pedestrian and cyclist routes; hard and soft landscaping and boundary treatments; waste storage; plant; signage; a new vehicular and pedestrian access onto the Mungret Park Road; public lighting; substations; all associated site development works; and all drainage and foul sewer infrastructure and network works including a pumping station and connections to the existing networks and nature-based suds measures.

Access to the proposed development will be via a proposed vehicular and pedestrian access to the existing Mungret Link Road.

2.0 TRAFFIC AND TRANSPORTATION

The Road Safety Audit Stage 1 Report by MHL has been included with this planning application under separate cover.

The Traffic and Transport Assessment by MHL has been included with this planning application under separate cover.

The Mobility Management Plan by MHL has been included with this planning application under separate cover.

The Outline Construction Traffic Management Plan, 24051-OSL-00-RP-C-0005, has been included with this planning application under separate cover.

3.0 ROADS

For effective road design in Ireland, compliance with Transport Infrastructure Ireland's (TII) Design Manual for Roads and Bridges (DMRB) and the Design Manual for Urban Roads and Streets (DMURS) is critical, alongside adherence to legislative requirements such as the Roads Act and Planning and Development Act. Incorporating road safety, sustainability, and environmental considerations ensures designs meet modern standards.

The following guidelines and standards (non-exhaustive list) formed the basis of the road design for this proposed development:

- Design Manual for Roads and Bridges (DMRB), TII Publications
- Traffic Management Guidelines, Department of Transport, TII and the National Roads Authority
- Geometric Design of Major/Minor Roads and Junctions, TII Publications
- Design Manual for Urban Roads and Streets (DMURS), Department of Transport Tourism and Sport
- Pavement Design Guidelines, TII Publications
- Road Safety Audit Guidelines, TII Publications
- Environmental Impact Assessment (EIA) Guidelines, Environmental Protection Agency
- Recommendations for Site Developments Works for Housing Areas (October, 1998)

3.1 COMPLIANCE WITH DMURS

The development layout has been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS) as published by the Department of Transport, Tourism and Sport. Strong pedestrian connectivity, slow vehicle speeds and good visibility for road users is integral to the design of the development street network.

The development has placed pedestrians at the top of the hierarchy. Footpath widths throughout the site are 2m and several shared spaces for pedestrians have been provided. Provision has been made to continue the existing cycling infrastructure from the Mungret Link Road through the development which creates a safe, coherent, and attractive cycling environment that encourages active travel for all users, especially children and less confident cyclists.

On cul-de-sacs in the site, a "shared surface" will be provided on which vehicles, bicycles and pedestrians share the same surface. This will assist in giving pedestrians priority and in reducing vehicle speeds.

The internal roads within the estate have sightlines of 23m (2.4m setback) for a given design speed of 30km/hr which is consistent with the forward visibility requirements as stated within DMURS.

The minimum level of forward visibility required along a street for a driver to stop safely, should an object enter its path, is based on the Stopping Sight Distances (SSD). The SSD has 3 constituent parts:

- Perception Distance: The distance travelled before the driver perceives a hazard.
- Reaction Distance: The distance travelled following the perception of a hazard until the driver applies the brakes.
- Braking Distance: The distance travelled until the vehicle decelerates to a halt.'

Although the internal roads within the estate have been design for Forward Visibility design speeds of 30km/hr, the actual speeds within the estate will be much less due to the additional traffic management measures (horizontal and vertical deflection) that have been incorporated into the site to ensure reduced speeds within the site.

Road widths in the proposed development are 5.5m and 6m for main estate routes and links, and 4.8m for shared surface roads, cul-de-sacs and minor arms.

The DMURS Statement of Compliance 24051-OSL-00-RP-C-0004 has been included with this planning application under separate cover.

4.0 SITE SPECIFIC FLOOD RISK ASSESSMENT

OSL has prepared a Site Specific Flood Risk Assessment on behalf of Homeland Projects Ltd., in support of the planning application for the proposed development at Mungret, Limerick, County Limerick.

The Site Specific Flood Risk Assessment, 24051-OSL-00-RP-C-0007, has been included with this planning application under separate cover.

The following is the summary of the flood risk assessment:

- The site including all proposed residential dwellings is located in Flood Zone C as defined by the requirements of “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices.
- Following the Flood Risk Assessment Stage 2 (Initial Flood Risk Assessment), it was determined that a Justification Test was not required.
- To prevent any potential of flooding within the vicinity from the proposed development, it is proposed to implement SuDS measures as discussed in the Infrastructure Report and Drainage Impact Assessment in order to limit the discharge from the site to that of the current greenfield discharge rates. The implementation of these SuDS measures will not increase the risk of flooding elsewhere. It is considered that the proposed development will have a negligible impact on the potential flood regime of the area.

In conclusion, the proposed development is considered to have the required level of flood protection up to and including the 1% AEP storm event.

5.0 WATER

5.1 EXISTING SERVICES

There is an existing 100mm diameter (nominal bore) HDPE watermain located in Mungret Link Road. This main is serviced/supplied via the existing 150mm diameter network located in Mungret Park Road (Mungret LIHAF Road) to the east and southeast of the subject site.

Please refer to Appendix A for the Existing Services Layout.

5.2 PROPOSED SERVICES

A pre-connection feasibility enquiry was made to Uisce Éireann to confirm whether there is adequate capacity in the public network to accommodate the proposed Large-scale Residential Development (CDS 25006693). The proposed connection was deemed feasible with upgrades. The upgrade works required, as determined by Uisce Éireann, includes approximately 90m of the existing 100mm diameter to be upgraded to a 200mm diameter. A submission for the design vetting (Statement of Design Acceptance, SODA) of the design proposal has been made to Uisce Éireann in October 2025. OSL is yet to receive the SODA from Uisce Éireann.

It is proposed that this development will be serviced by 200mm, 150mm and 100mm diameter watermain, in accordance with the Uisce Éireann Code of Practice, and will include the provision of new fire hydrants and relevant infrastructure throughout the site. Using the Uisce Éireann guidelines and parameters, the estimated peak demand from the development has been calculated as 5.64 l/s with the average daily demand being 0.90 l/s.

A bulk water meter will be provided at the connection to the site. The supply arrangements will be carried out to the requirements of Uisce Éireann.

All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Uisce Éireann 'Standard Details for Water Infrastructure', 'Code of Practice for Water Infrastructure' and the Department of the Environment's Building Regulations "Technical Guidance Document B - Fire Safety (2020)".

Please refer to Appendix B for the UÉ Correspondence.

Please refer to Appendix C for the Water Demand Calculations.

Please refer to drawing no. 24051-OSL-11-DR-C-1140.

6.0 FOUL SEWER

6.1 EXISTING SERVICES

There is an existing 225mm diameter foul line located within the Mungret Link Road to the southeast of the subject site. This foul sewer was installed as part of the Mungret Park Road works (Mungret LIHAF Road) and services the lands adjacent to the Mungret Park Road (Mungret LIHAF Road).

This existing foul line and receiving network eventually discharges to the Limerick Wastewater Treatment Plant.

Please refer to Appendix A for the Existing Services Layout.

6.2 PROPOSED SERVICES

A pre-connection feasibility enquiry was made to Uisce Éireann to confirm whether there is adequate capacity in the public network to accommodate the proposed Large-scale Residential Development (CDS 25006693). The proposed connection was deemed feasible without upgrades. A submission for the design vetting (Statement of Design Acceptance, SODA) of the design proposal has been made to Uisce Éireann in October 2025. OSL is yet to receive the SODA from Uisce Éireann.

It is proposed that this development will be serviced internally by 150mm and 225mm diameter foul sewers, in accordance with the Uisce Éireann Code of Practice, and will include the provision of services connections, inspection chambers etc. throughout the site.

Due to the topography of the site, and invert levels of the existing foul sewer infrastructure mentioned above, it is not possible to connect to the existing infrastructure by means of gravity. It is thus proposed to include a foul sewer pump station within the development in order to lift foul sewer through pumping to the existing foul sewer. The proposed foul sewer pumping station has been designed in accordance with Uisce Éireann's *Code of Practice for Wastewater Infrastructure*. The design incorporates dual submersible pumps operating on a duty/standby arrangement, with ductile iron pipework to IS EN 598. Adequate emergency storage has been provided in line with development scale, together with odour and septicity control measures. A dedicated metered power supply, automated controls, and provision for telemetry/remote monitoring have been included, alongside appropriate alarm and call-out systems. Safe vehicular access for maintenance, tanker removal of wet well contents, and lifting/handling equipment have been integrated. Flood risk, site security, fencing, and odour setback requirements have also been addressed to ensure the pumping station is fit for purpose and fully compliant with Uisce Éireann standards.

Foul sewers have been designed in accordance with the Uisce Éireann 'Standard Details for Wastewater infrastructure' and 'Code of Practice for Wastewater Infrastructure'. In addition, foul sewers have been designed to the Building Regulations 1997, as amended, (referred to within as 'the Building Regulations') and specifically in accordance with the principles and methods set out in EN 752:2008 and DOE 'Recommendations for Site Development Works' (1998).

In addition, HR Wallingford 'Tables for the Hydraulic Design of Pipes, Sewers and Channels' and Water UK/WRC 'Sewers for Adoption – 6th Edition' have been applied. Values for roughness of uPVC pipes were obtained from Wallingford "Tables for the Hydraulic Design of Pipes, Sewers and Channels" and Wavinsewer systems catalogue.

Using the Uisce Éireann guidelines and parameters, the estimated peak discharge from the development has been calculated as 5.95 l/s with the average discharge being 0.99 l/s.

Foul sewer shall be constructed to comply with the requirements of the Building Regulations 1997 in accordance with the recommendations contained in the Technical Guidance Documents, Section H (revised 2005) and the Uisce Éireann Code of Practice and Standard Details for Wastewater Infrastructure.

Please refer to Appendix B for the UÉ Correspondence.

Please refer to Appendix D for the Foul Sewer Calculations.

Please refer to drawing no. 24051-OSL-11-DR-C-1130 to 1134.

7.0 SURFACE WATER

Please refer to the Surface Water Design Report, 24051-OSL-00-RP-C-0011, included under separate cover as part of this application, for detailed information related to the surface water design of the proposed development.

The findings are summarised as follows:

- In relation to Flooding, under the OPW Planning System and Flood Risk Management Guidelines published in November 2009, the proposed development is considered appropriate and located within Flood Zone C.
- The Infiltration Test Results indicate that the underlying soils at the site are capable of supporting infiltration-based SuDS features. All infiltration rates fall within typical ranges suitable for soakaway design as per BRE 365 guidance.
- Due to the topography of the site, and invert levels of the existing surface water sewer infrastructure mentioned above, it is not possible to connect to the existing infrastructure by means of gravity. It is thus proposed to include a surface water pump station within the development in order to lift surface water through pumping to the existing surface water sewer. The proposed surface water sewer pumping station, at detailed design stage, will be designed in accordance with Uisce Éireann's *Code of Practice for Wastewater Infrastructure*.
- The proposed development will be serviced by new surface water infrastructure and connect to the existing surface water sewer, by means of a surface water pump station mentioned above, located in Mungret Park Road.
- Surface water from the site will be collected and attenuated on site, with a peak discharge rate of 11.2l/s (2l/s/ha as per the LCCC Surface Water/SuDS Specification 2022) for the 1 in 100 Year rainfall event (including an allowance of 30% for climate change and 10% Urban Creep).
- As part of the development, a number of different SuDS measures will be provided to minimise the impact on water quality and water quantity of the runoff and maximise the amenity and biodiversity opportunities within the site.
- The Risk and Mitigation Indices for proposed development areas and the pollution typically generated was assessed through the Simple Index Approach. For all areas/cases assessed, the mitigation index is greater than the pollution index for each contaminant type. Therefore, the range of SuDS measures proposed satisfies the Simple Index Approach and provides adequate mitigation for the site.
- The Geological Survey Ireland (GSI) classifies the aquifer vulnerability in the area of the proposed development as "high" to "extreme". Given the high level of treatment incorporated and the nature of the surface water runoff (predominantly from low-risk areas such as roofs and landscaped surfaces), we are confident that infiltration to the underlying aquifer is an appropriate and sustainable approach in this context

8.0 UTILITIES

8.1 EXISTING UTILITIES

A request for existing utility records from all major utility providers in Ireland has been made for the purpose of application. The following information is based on record information to hand, at the time of preparing the report.

Please refer to Appendix A for the Existing Services Layout.

8.1.1 ESB

ESB records indicate that there are existing 110kV overhead ESB infrastructure within the vicinity of the proposed development. OSL has engaged with ESB with regards to this proposed development.

8.1.2 Eir

EIR records indicate that there is telecom infrastructure located in the vicinity, including within the Mungret Link Road to the southeast and Mungret Park Road (Mungret LIHAF) to the east, of the proposed development.

8.1.3 Virgin Media

OSL is yet to receive a response on from Virgin Media with regards to existing services records. It is not anticipated that there are any Virgin Media services located within the subject site.

8.1.4 Gas Networks Ireland

Gas Networks Ireland (GNI) records indicate that there is an existing 200mm diameter gas main traversing the subject site. The aforementioned gas main is labelled as being a high-pressure transmission line.

OSL has engaged with GNI and discussed with them the proposed site layout as well as coordination with proposed future levels and services. In summary, GNI has provided positive feedback and guidance with regards to the supervision and involvement of GNI preconstruction of the proposed development.

9.0 SUMMARY

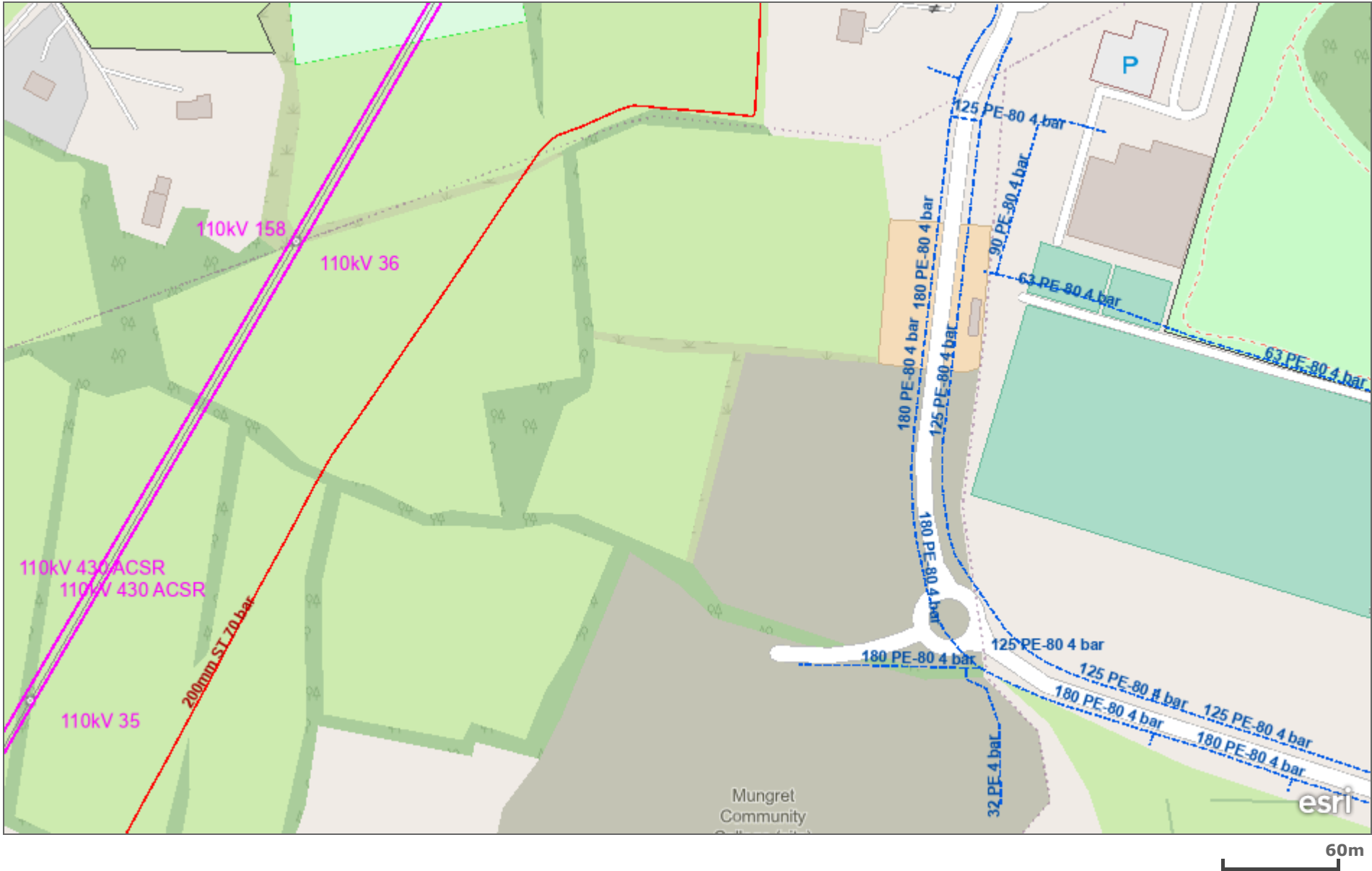
This report has outlined the engineering proposals associated with Homeland Projects Ltd.'s application for a Large-scale Residential Development at Caheranardish, Limerick, County Limerick on a circa 6-hectare site.

The findings are summarised as follows:

- The proposed development will be served by a new water supply network. The water supply network to serve the development will be constructed in accordance with Uisce Éireann Code of Practice and Standard Details for water infrastructure.
- The proposed development will be served by new foul infrastructure. The foul network to serve the development will be constructed in accordance with Uisce Éireann Code of Practice and Standard Details for wastewater infrastructure. Due to the topography of the site, and invert levels of the existing foul sewer infrastructure, it is not possible to connect to the existing infrastructure by means of gravity. It is thus proposed to include a foul sewer pump station within the development in order to lift foul sewer through pumping to the existing foul sewer.
- The surface water management regime and network design has been detailed within the Surface Water Design Report, 24051-OSL-00-RP-C-0011 included under separate cover as part of this application. Due to the topography of the site, and invert levels of the existing surface water infrastructure, it is not possible to connect to the existing infrastructure by means of gravity. It is thus proposed to include a foul sewer pump station within the development in order to lift foul sewer through pumping to the existing foul sewer. In accordance with Limerick City and County Council's Surface Water/SuDS Specification 2022, site discharge levels should not exceed 2 l/s/ha or Q_{bar} whichever is the greater restriction. Therefore, the allowable discharge for the development was calculated as 11.2 l/s for the 1 in 100 Year rainfall event (including an allowance of 30% for climate change and 10% for urban creep). As part of the development, a number of different SuDS measures will be provided to minimise the impact on water quality and water quantity of the runoff and maximise the amenity and biodiversity opportunities within the site.
- There are a number of utility providers with infrastructure within the vicinity of the development.

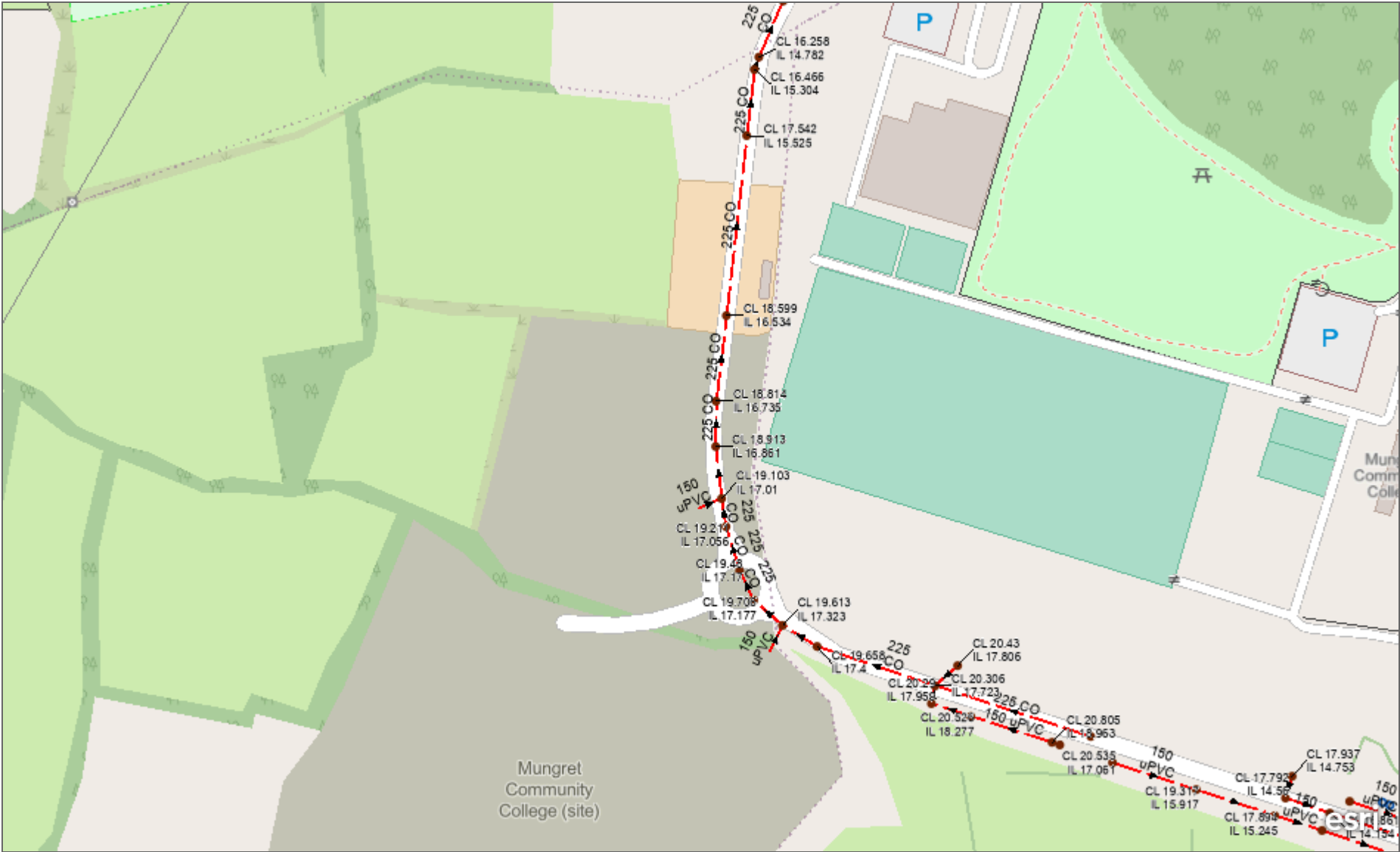
Appendix A – Existing Services

My Map



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri | ESB

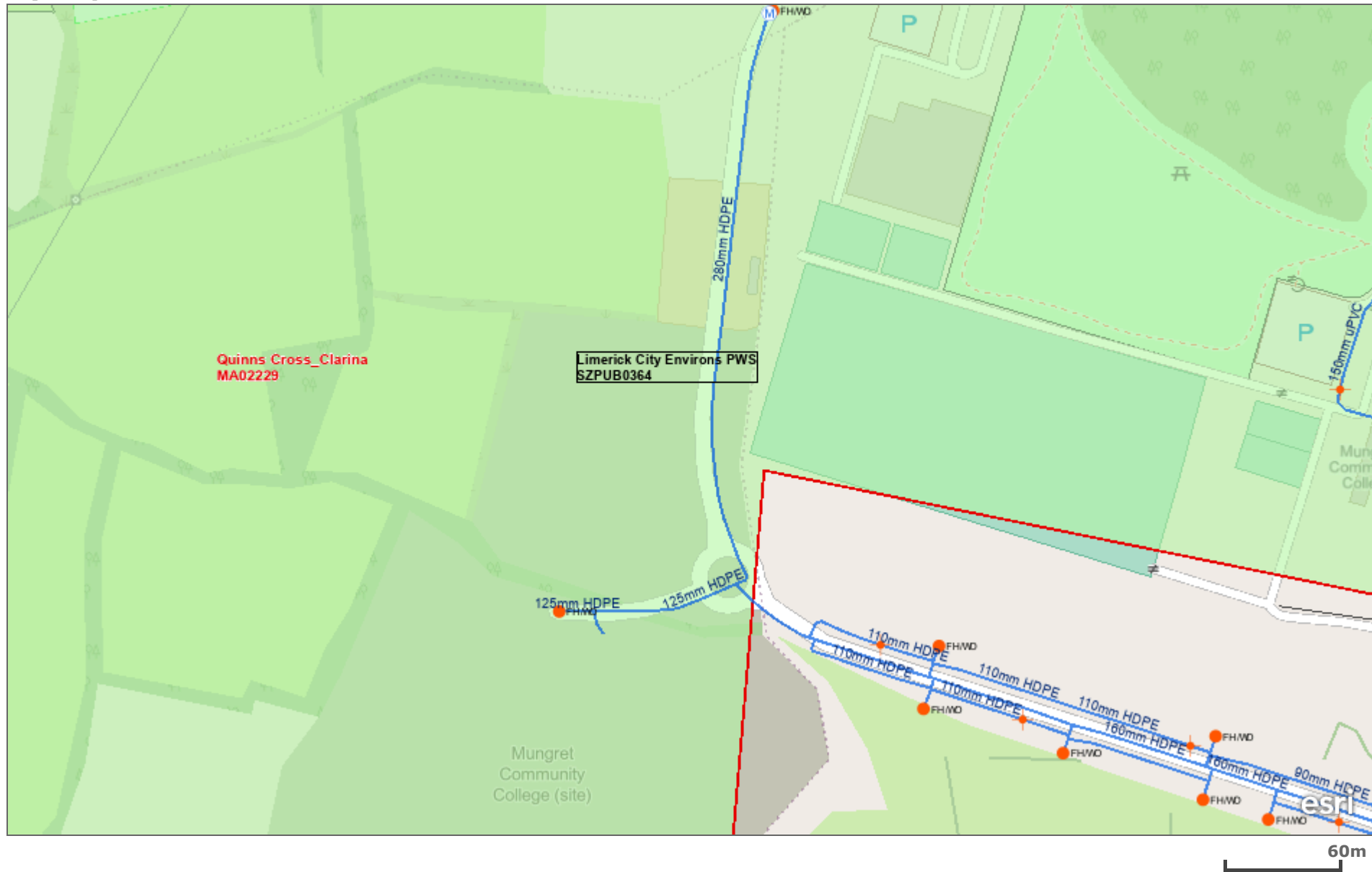
SewerStormWaterNetwork



Sewer Storm Water Network

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

My Map



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Appendix B – UÉ Correspondence

CONFIRMATION OF FEASIBILITY

David Butler
OSL Butler
38 Eastgate Drive
Little Island
Cork
T45 Y049

13 October 2025

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

Our Ref: CDS25006693 Pre-Connection Enquiry Caheranadrish, Mungret, Limerick

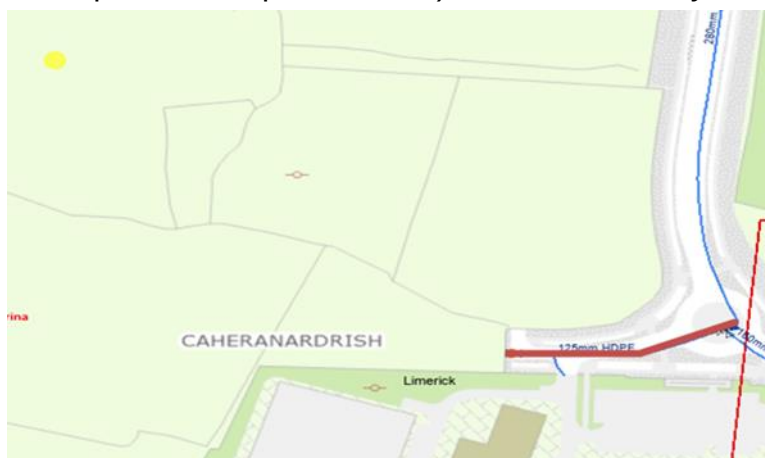
Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 201 unit(s) at Caheranadrish, Mungret, Limerick (the **Development**).

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible Subject to upgrades
- In order to accommodate the proposed connection at the development, upgrade works are required to the existing water network . These upgrade works (approximately 90 metres of upgrade, from 125mm to 200mm, please find photo below) are not currently on Uisce Éireann investment



plan therefore, the applicant will be required to fund these local network upgrades. At connection application stage, the network upgrade requirements will be reviewed, and you will be provided with a quote for these works.

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.

Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86

Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.

Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

- Feasible without infrastructure upgrade by Uisce Éireann
- **Wastewater Connection**
 - In order to complete the proposed connection, the network will have to be extended by approximately 93 metres from Mungret Road to the Development site. The Developer will be required to fund the extension works. The fee will be calculated at a connection application stage.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

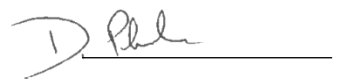
Where can you find more information?

- **Section A** - What is important to know?
- **Section B** - Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit www.water.ie/connections, email newconnections@water.ie or contact 1800 278 278.

Yours sincerely,



Dermot Phelan
Connections Delivery Manager

Section A - What is important to know?

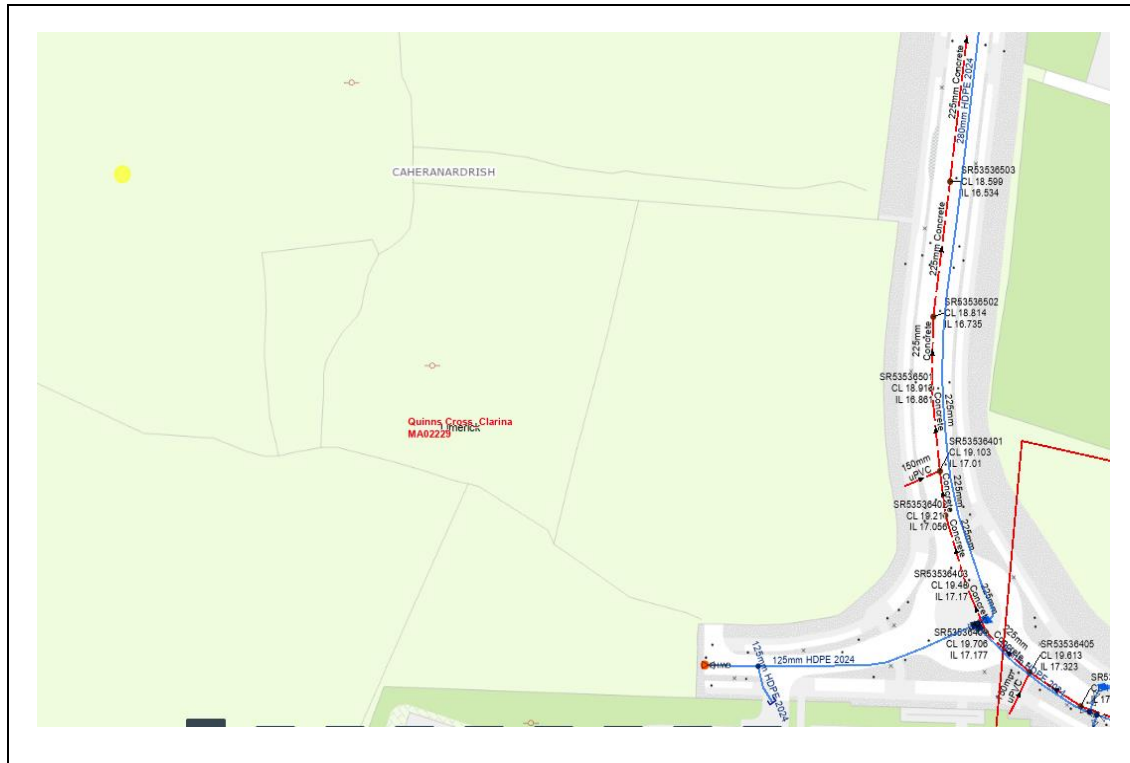
What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application <u>and be granted and sign</u> a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • What to do? - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • What to do? - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with <i>the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice</i>, available at www.water.ie/connections
Trade Effluent Licensing	- Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). - More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Uisce Éireann’s Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email

datarequests@water.ie



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Note: The information provided on the included maps as to the position of Uisce Éireann’s underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann’s network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann’s underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann’s underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Appendix C – Water Demand Calculations

TITLE
Proposed Development at Mungret, Limerick

Job Reference
24051



SUBJECT
Water Demand Calculations - Post Development

Calc. Sheet No.
1

DRAWING NUMBER
24051-OSL-11-DR-C-1140

Calculations by
BJM

Checked by DB
Date 24/09/2025

DEMAND

Housing Units	180	no.
Daily Demand per person	150	litres/person/day
Average Occupancy Ratio ¹	2.7	person/unit
Total Site Occupancy	486	people
Average Daily Demand	72,900	l/day
Average Day in Peak Week ²	91,125	l/day
Normal Length of Day ³	12	hours
Peak Factor ⁴	5.0	

Post Development Peak Water Demand⁵	5.27	l/s
Post Development Average Water Demand	0.84	l/s
Normal Demand⁶	1.69	l/s

Notes:

1. Occupancy ratio of 2.7 persons per dwelling from Irish Water Code of Practice for Water Infrastructure.
2. Average Day in Peak Week is 1.25 times the average daily demand.
3. Assumed normal demand is the total daily demand during the normal length of day.
4. Peak Factor for pipe sizing from Irish Water Code of Practice for Water Infrastructure
5. Peak Factor multiplied by Average Day in Peak Week flow
6. Normal demand is the total daily demand during the normal length of day.
7. Fire flow is required at 25l/s as per B.S. 5306-1:1976.

TITLE
Proposed Development at Mungret, Limerick

Job Reference
24051



SUBJECT
Water Demand Calculations - Post Development

Calc. Sheet No.
2

DRAWING NUMBER
24051-OSL-11-DR-C-1140

Calculations by
BJM

Checked by
DB

Date
24/09/2025

DEMAND

Daily Demand per person¹

Day Staff ⁷ people litres/person/day

Children people litres/person/day

Average Daily Demand l/day

Average Day in Peak Week² l/day

Normal Length of Day³ hours

Peak Factor⁴

Post Development Peak Water Demand⁵ l/s

Post Development Average Water Demand l/s

Normal Demand⁶ l/s

Notes:

1. Daily Demand per person is 50 litres/person/day for Staff taken from Irish Water "Code of Practice for Wastewater Infrastructure".
2. Average Day in Peak Week is 1.25 times the average daily demand.
3. Assumed normal demand is the total daily demand during the normal length of day.
4. Peak Factor of 2.1 assumed due to size of development.
5. Peak Factor multiplied by Average Day in Peak Week flow
6. Normal demand is the total daily demand during the normal length of day.
7. Ratio of Adults to Children 1:5, Schedule 6 of the Child Care Act 1991 (Early Years Service) Regulations 2016.

Appendix D – Foul Sewer Calculations

TITLE
Proposed Development at Caheranardish, Limerick, Co. Limerick

Job Reference
24051



SUBJECT
Wastewater Discharge Calculations - Post Development

Calc. Sheet No.
1

DRAWING NUMBER
24051-OSL-11-DR-C-1130

Calculations by
BJM

Checked by
DB

Date
27/02/2026

Foul Drainage

Housing Units	182	no.
Dry Weather Flow (DWF) ¹	150	litres/person/day
Average Occupancy Ratio ²	2.7	person/unit
Total Site Occupancy (i.e. population)	491	person
Total Daily Wastewater Discharge + 10% Unit Consumption Allowance ³	81,081	l/day
Peak Flow Factor ⁴	6.0	

Post Development Average Discharge 0.94 l/s

Post Development Peak Discharge⁵ 5.63 l/s

Foul Sewer Organic Loading

	Average Concentration ⁶	Maximum Concentration ⁷
BOD (mg/l)	168	422
SS (mg/l)	163	435
N (mg/l)	40.6	78.6
P (mg/l)	7.1	15.5
COD (mg/l)	389	1000

Notes:

1. Dry Weather Flow (DWF) is 150 litres/person/day from the Irish Water Code of Practice for Wastewater Infrastructure.
2. Occupancy ratio of 2.7 persons per dwelling from Irish Water Code of Practice for Wastewater Infrastructure.
3. The unit consumption allowance is 10% in accordance with the Irish Water Code of Practice for Wastewater Infrastructure.
4. The Peak Flow factor is taken as 6 times Dry Weather Flow (0 to 750 population), 4.5 DWF for 751 to 1000 and 3.0 DWF for 1001 to 5000
5. The peak discharge is equal to the Total Wastewater Discharge multiplied by the peak flow factor, expressed in litres/second.
6. The average concentrations of wastewater parameters taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".
7. Assumed Maximum concentration is equal to the average concentration plus 2 times the standard deviation (for the 95%ile) taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".

TITLE Proposed Development at Caheranardrish, Limerick, Co. Limerick		Job Reference 24051	
SUBJECT Wastewater Discharge Calculations - Post Development		Calc. Sheet No. 2	
DRAWING NUMBER 24051-OSL-11-DR-C-1130	Calculations by BJM	Checked by DB	Date 27/02/2026

Foul Drainage

Day Staff ⁷	14	no.
Dry Weather Flow (DWF) ¹	50	litres/person/day
Children	70	no.
Dry Weather Flow (DWF) ¹	50	litres/person/day
Total Daily Wastewater Discharge + 10% Unit Consumption Allowance ²	4,620	l/day
Peak Flow Factor ³	6.0	

Post Development Average Discharge	0.05	l/s
Post Development Peak Discharge ⁴	0.32	l/s

Foul Sewer Organic Loading

	Average Concentration ⁵	Maximum Concentration ⁶
BOD (mg/l)	168	422
SS (mg/l)	163	435
N (mg/l)	40.6	78.6
P (mg/l)	7.1	15.5
COD (mg/l)	389	1000

Notes:

1. Dry Weather Flow (DWF) is 50 litres/person/day for Staff and Patrons taken from Irish Water "Code of Practice for Wastewater Infrastructure".
2. The unit consumption allowance is 10% in accordance with the Irish Water "Code of Practice for Wastewater Infrastructure".
3. The Peak Flow factor is taken from Irish Water "Code of Practice for Wastewater Infrastructure" Appendix C Section 1.2.7
4. The peak discharge is equal to the Total Wastewater Discharge multiplied by the peak flow factor, expressed in litres/second.
5. The average concentrations of wastewater parameters taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".
6. Assumed Maximum concentration is equal to the average concentration plus 2 times the standard deviation (for the 95%ile) taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".
7. Ratio of Adults to Children 1:5, Schedule 6 of the Child Care Act 1991 (Early Years Service) Regulations 2016.