

The logo for OCSC is displayed in a large, bold, green font. Below it, the text 'O'CONNOR · SUTTON · CRONIN' and 'MULTIDISCIPLINARY CONSULTING ENGINEERS' is written in a smaller, green, sans-serif font. The background of the top half of the page is a green wireframe architectural drawing of a city street scene, viewed from an elevated perspective, with a large white circular shape on the left side.

OCSC

O'CONNOR · SUTTON · CRONIN
MULTIDISCIPLINARY CONSULTING ENGINEERS

W370: WICKLOW FIRE STATIONS

DRAINAGE REPORT – STAGE 1 DUNLAVIN

**For
Wicklow County Council**

19 June 2023

NOTICE

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DOCUMENT CONTROL & HISTORY

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1 SITE SERVICES

EXISTING INFRASTRUCTURE & SITE CHARACTERISTICS

Existing records for the local area have been obtained from Irish Water and are included in **Appendix A** of this report. Additional site investigation works were commissioned which also included the Soakaway infiltration test for the proposed Dunlavin site.

Based on the received data and the conducted site investigation it is established that there is:

- An existing wastewater network running north-west of the site and in the immediate vicinity of the Dunlavin Wastewater Treatment Plant (WWTP). The said existing network is 150mm diameter and drains to the Dunlavin WWTP.
- An existing 100 mm diameter watermain running approximately 120m east of the site running along the Church Road.
- An existing surface water pipe located approximately 100 m away along the church road. However, the pipe discharges into a local ditch and is also located on the higher elevation thus gravity connection from the development is not feasible.
- The proposed site is not suited for infiltration solution for the surface water drainage.

The fire station development site is green field located in the southwestern corner of a bigger greenfield land. The existing site topography dictates that the said green field land drains largely from northeast to southwest direction. It currently drains through an existing 600mm diameter culvert located in the south-west corner of the site.

The available information with the design team did not confirm where the said existing culvert (IL=136.08m AOD) was discharging. Hence a site visit was conducted, which confirmed the presence of a live stream running along the southern edge of the access road to the Dunlavin WWTP. The stream appeared 3m below the embankment of the road, with the road embankment at 137.5 m AOD, the stream invert level is expected to be around 134.5m AOD. The upstream head wall of the culvert was spotted during the site visit, but the downstream end was neither accessible nor visible due to dense vegetation. However, the site visit confirmed that the treated discharge from the nearby Dunlavin WWTP is being discharge into the same stream hence it was reasonably assumed based on the above background that the existing culvert from the site discharges into the same stream.



Figure 1: Site Location

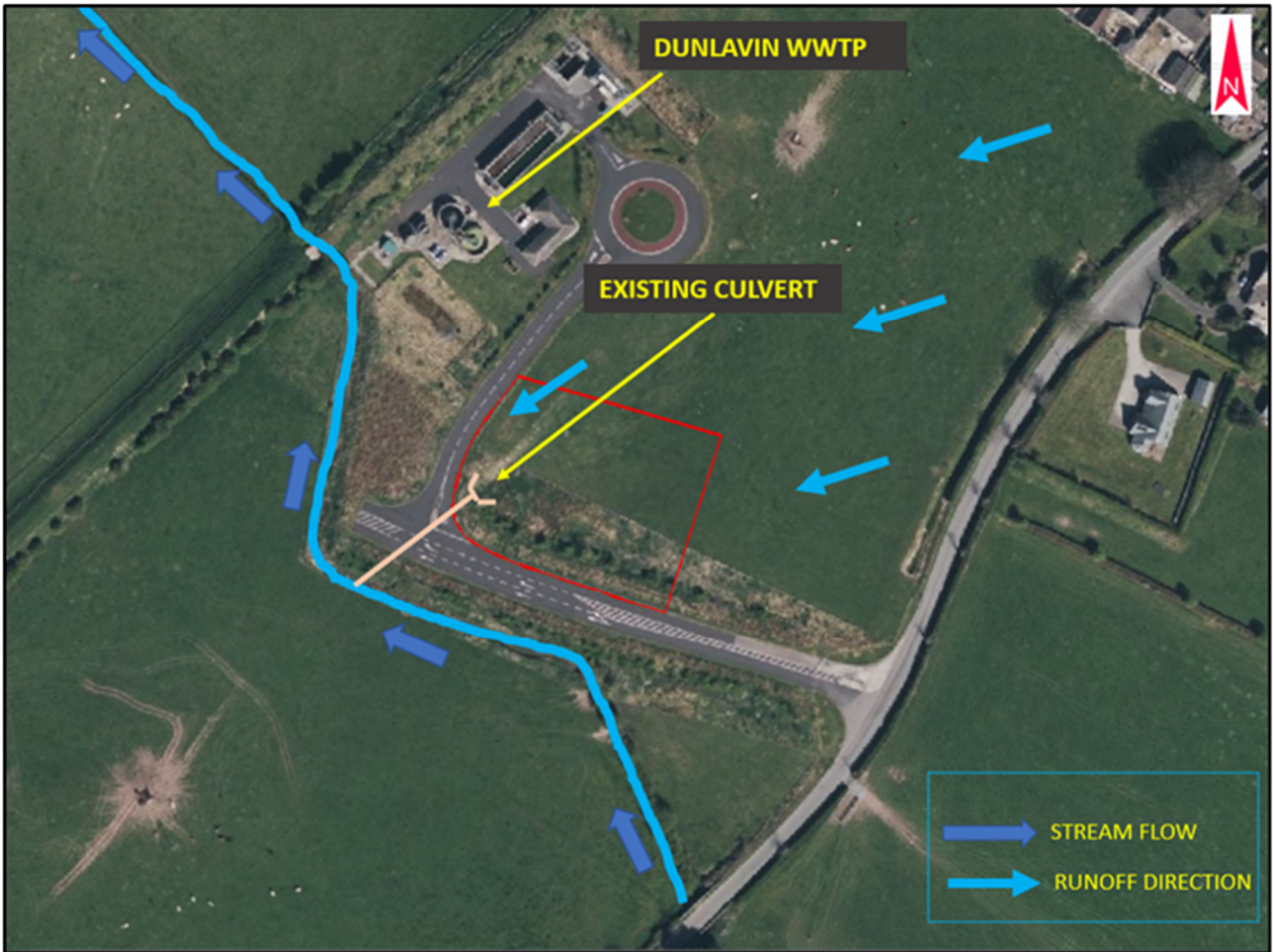


Figure 2: Existing surface water drainage

SURFACE WATER DESIGN STRATEGY

The surface water design will comply with the following standards and best practice guidance:

- Wicklow County Development Plan 2022-2028
- Climate Change Adaptation Strategy 2019 - 2024;
- Greater Dublin Strategic Drainage Study (GDSDS);
- Greater Dublin Regional Code of Practice for Drainage Works (GDR COP);
- Technical Guidance Document H – Drainage and Wastewater Disposal;
- The SUDs Manual, CIRIA C753.

The Dunlavin fire station development covers only a part of the proposed site boundary, and the remaining western part of the site is left unused to maintain the existing drainage of the area. Please refer to the site layout below in Figure 3.



Figure 3: Proposed Site Layout

- **Attenuation Storage: Detention Basin**

Above Ground, offline detention basin is provided for attenuating the surface water runoff before discharging into existing surface water network. The existing topography of the site and proposed ground levels dictated the location of the detention basin. The proposed basin would provide temporary storage in the event of rain and shall remain dry in the event of no rain.

The basin will provide sufficient temporary storage volume for rainfall events up to, and including, the design 1% AEP rainfall event (including climate change).



Figure 5: Typical Detention Basin

- Flow Control Devices

Flow Control devices provided immediately downstream of attenuation systems, in order to restrict the surface water discharge from site to a flow rate equivalent, or below, the natural greenfield runoff rate.

The required aperture of the proposed Hydro-Brake outlets is designed to be greater than 150mm diameter, to mitigate the risk of blockage. Each flow control chamber would be fitted with a penstock valve at the inlet and a bypass lever at the outlet (if required), to allow for easy access and maintenance.



Figure 6: Vortex Hydro-brake Flow Control Unit (Hydro International)

- Pervious Paving

Pervious pavements provide a pavement finish suitable for both pedestrian and vehicular traffic, while also allowing rainwater to infiltrate the surface layer and into the underlying pervious structural layers. Here, the rainwater is temporarily stored beneath the overlying finished surface before either infiltration to the ground or / and controlled discharge to the main surface water drainage network.

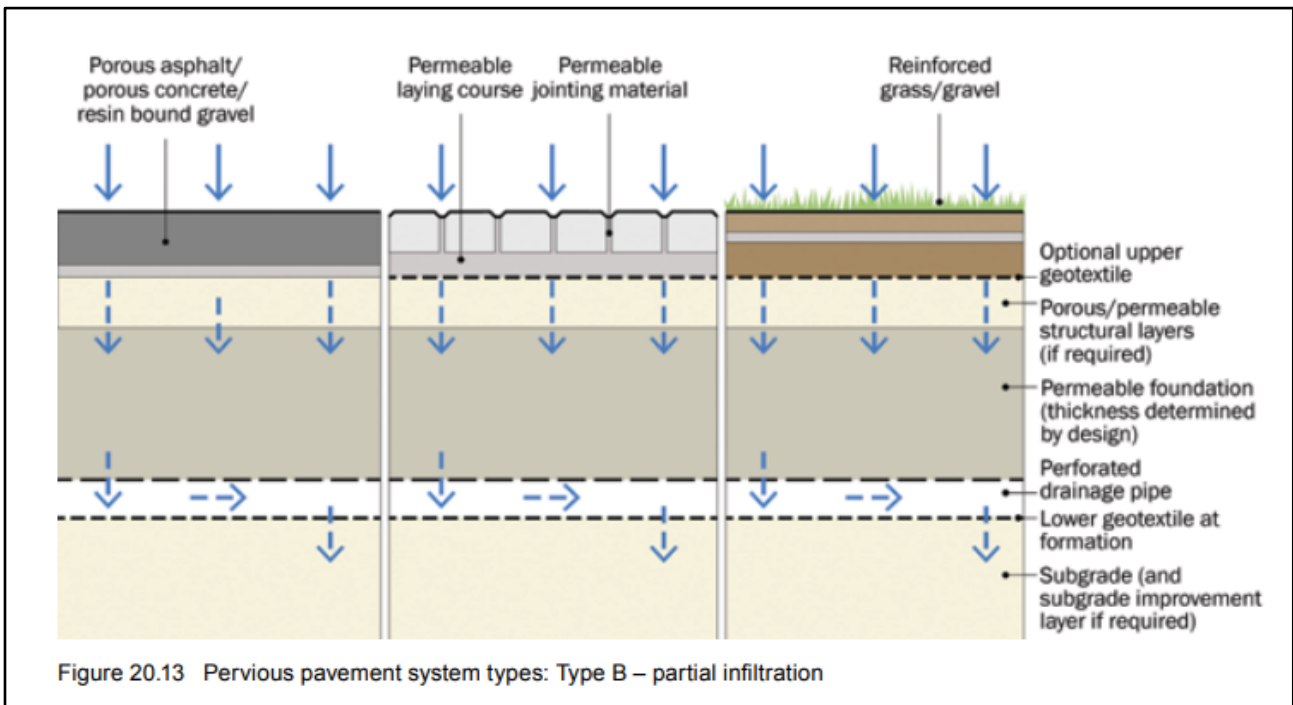


Figure 7: Detail of Type B Pervious Paving (CIRIA C753)

Pervious paving systems are an efficient means of treating the rainwater at source by providing initial interception of the rainwater, reducing the volume and frequency of the runoff and improving the surface water quality by providing at source treatment of the rainfall runoff leaving the site. This is achieved by helping remove and retain pollutants prior to discharge to the drainage system and / or groundwater system.

Pervious paving is to be provided in the car park areas, as indicated in the drainage drawing W370-OCSC-DL-XX-DR-C-0500

- Silt Traps

All manholes upstream of attenuation storage would contain a 600mm sump, below invert level of outlet pipe, in order to trap sediment and other gross pollutants, and prevent from entering the downstream watercourse; thus improving the water quality discharging from site.

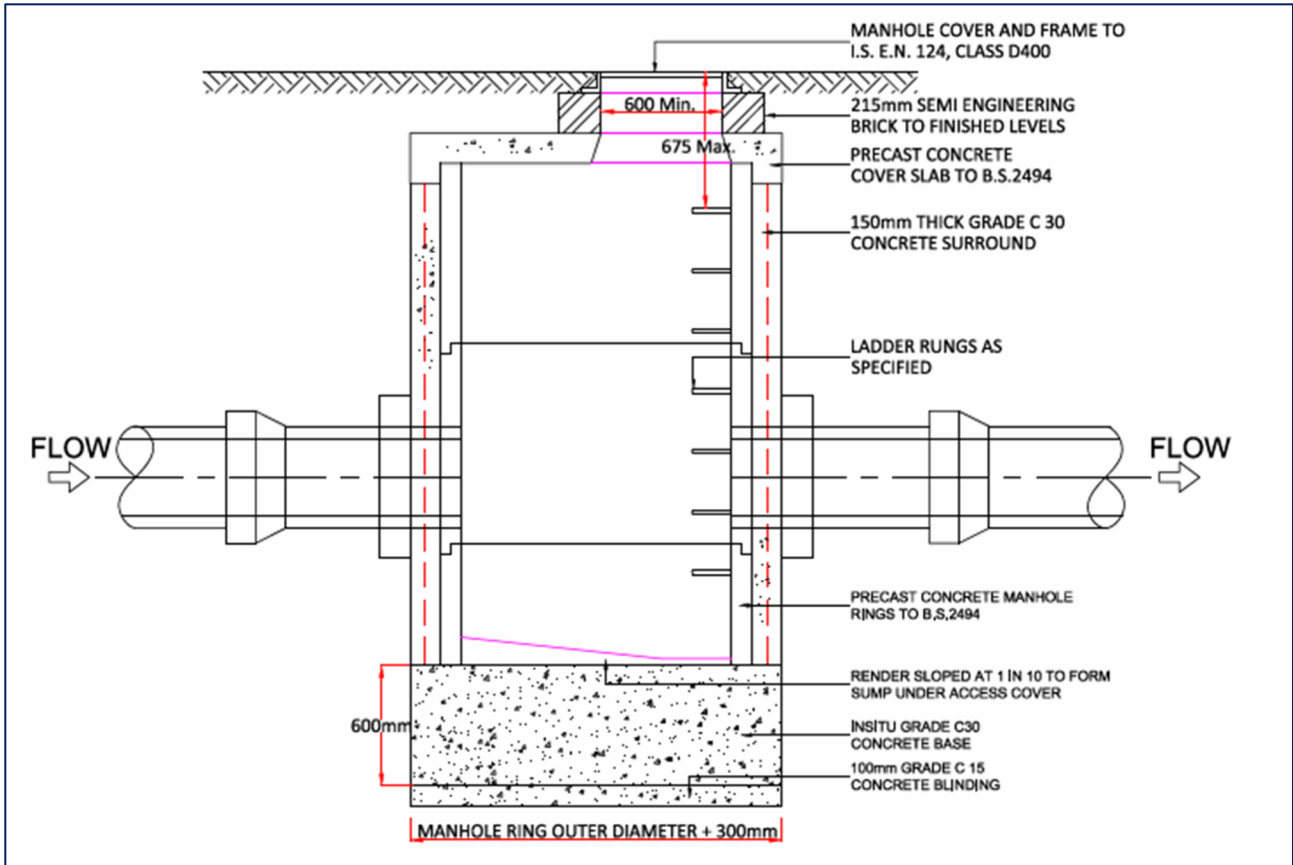


Figure 8: Typical Detail of Silt Trap Manhole

- Trapped Road Gullies

All road gullies serving the proposed development would be trapped to help prevent sediment and gross pollutants from entering the surface water network, therefore improving the water quality discharging from site.

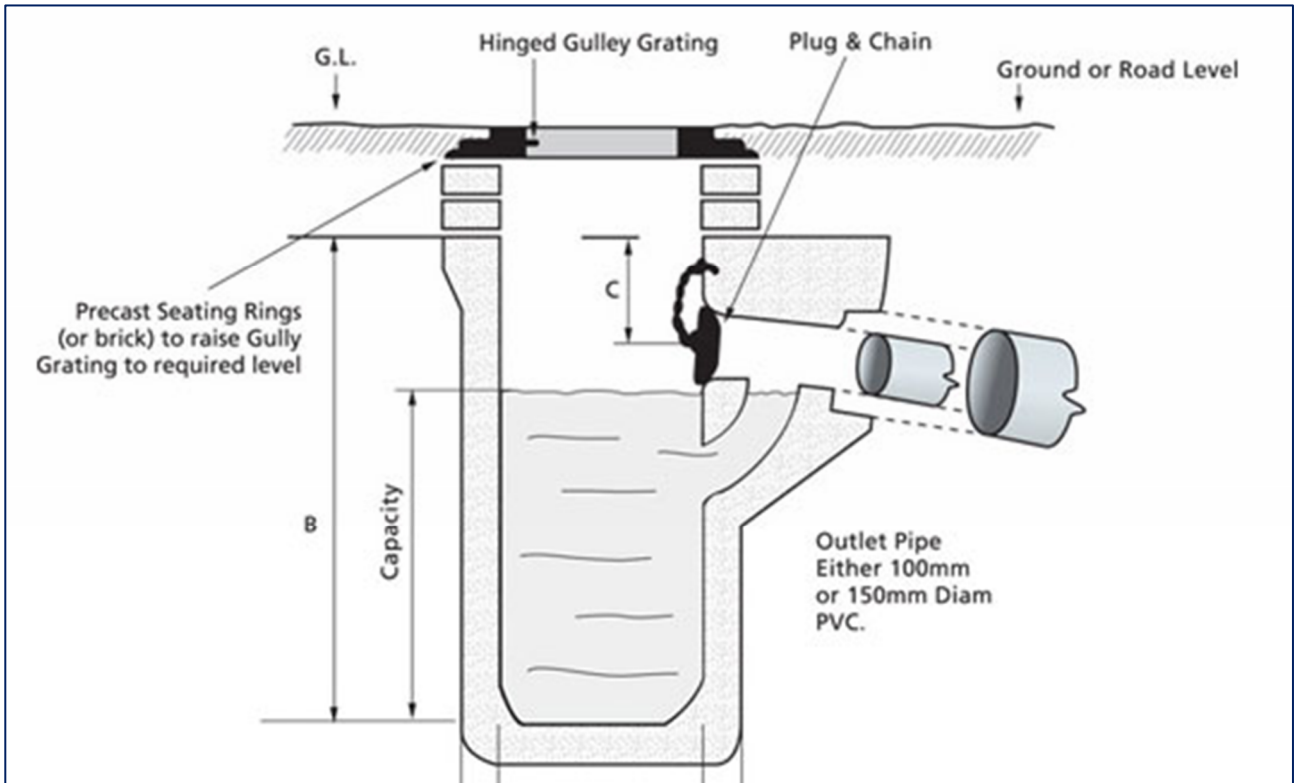


Figure 9: Trapped Road Gully (Typical Detail)

- Oil Separators

Oil separators are designed to separate gross amounts of oil and large (>250µm) suspended solids from the surface water, mainly through sedimentation process. The previously outlined measures also provide mitigation in this regard. However, a Class 1 bypass fuel separator would be additional and final mitigation measure, prior to surface water discharge to the public network.

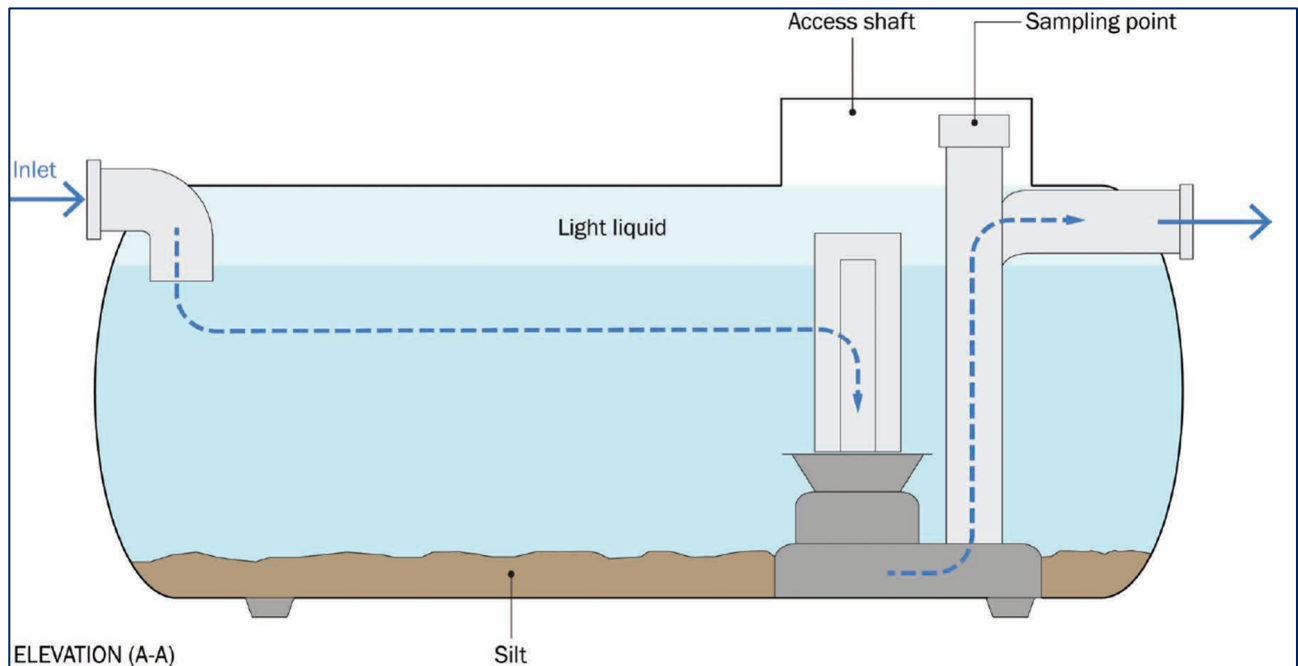


Figure 10: Typical Section Detail of Fuel Separator (CIRIA C753)

The feasibility of each of the aforementioned measures will be assessed as part of the design development and consultation with the Local Authority and incorporated where appropriate. Measures which can be incorporated into the extensive landscape design will also be considered.

WASTEWATER DRAINAGE DESIGN

The wastewater design will be carried out in accordance with the following:

- Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03);
- Wicklow County Development Plan, 2022-2028;
- Building Regulations - Technical Guidance Document H – Drainage and Wastewater Disposal.

A traditional gravity pipe and manhole network will be provided. All wastewater from the development is to discharge to public wastewater sewer running along north-west of the site and in the immediate vicinity of the Dunlavin Wastewater Treatment Plant (WWTP). The said existing network is 150mm diameter and drains to the Dunlavin WWTP.

Please refer to the included drainage drawing W370-OCSC-DL-XX-DR-C-0500 along with this submission.

A Confirmation of Feasibility (COF) has been received from the Irish Water which states that the connection to the existing network is feasible without any required upgrades. Please find the received confirmation of feasibility in the Appendix B of this report.

POTABLE WATER SUPPLY DESIGN

All proposed potable water design will be carried out in accordance with Irish Water's Code of Practice for Water Infrastructure, IW-CDS-5020-03.

The proposed development will require a 100mm watermain (with an additional 100mm branches to serve as a fire main (to be confirmed by the fire consultant), with a number of hydrants to be provided along its length at agreed locations.

A confirmation of feasibility has been received on the project which states that an extension of 120m of watermain is required to serve the development. The proposed watermain is to connect to the existing network east of the subject site on the Church Road.

2 VERIFICATION

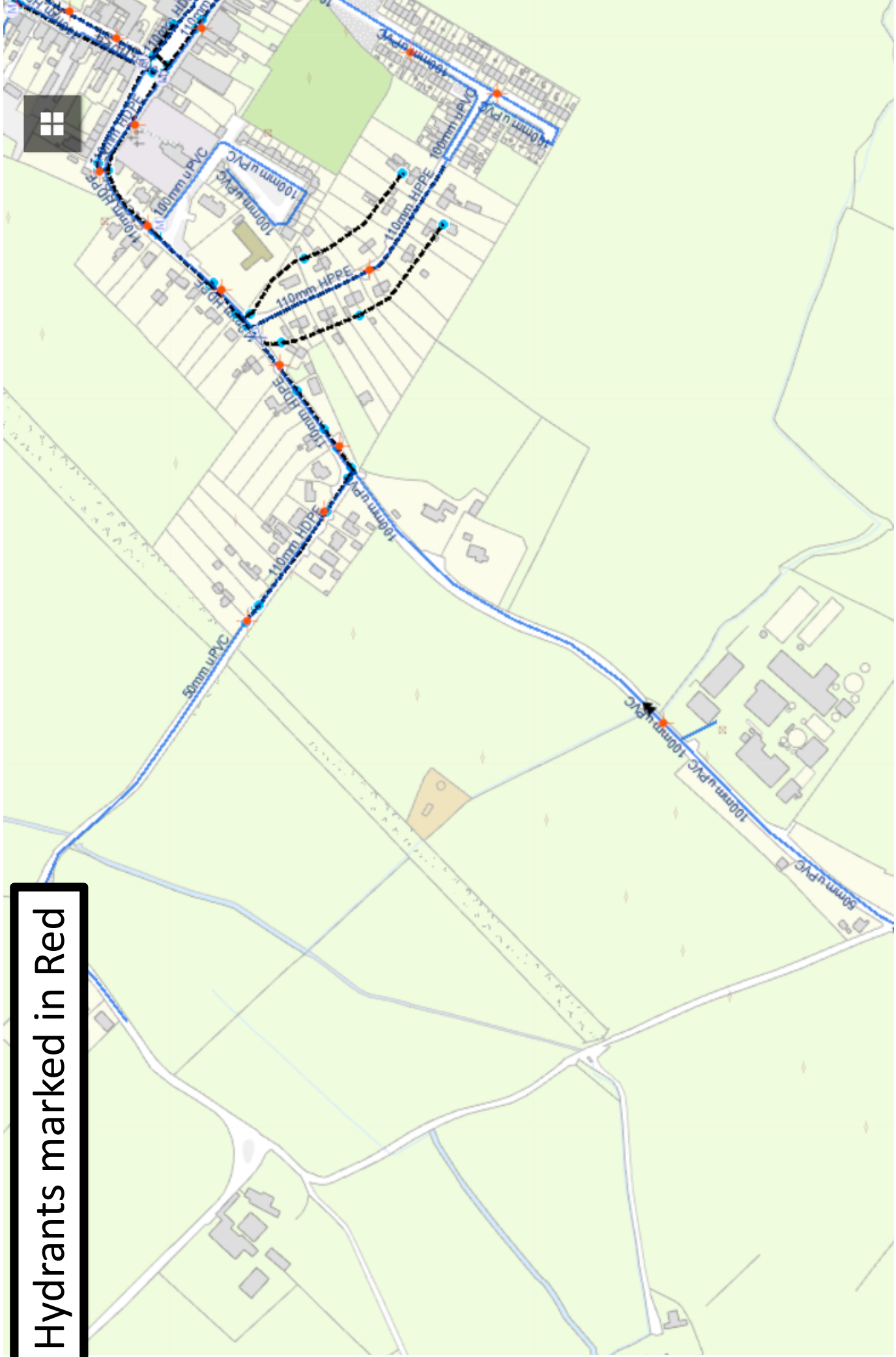
This report was compiled and verified by:

Dharmesh Purohit BE (Civil) MS Water Resources PMP
Senior Drainage Engineer
O'Connor Sutton Cronin & Associates



Appendix A **EXISTING SITE SERVICE RECORDS**

Hydrants marked in Red



Storm Drainage Network



Appendix B **CONFIRMATION OF FEASIBILITY**

CONFIRMATION OF FEASIBILITY

Dharmesh Purohit

9 Prussia Street
Dublin 7
Dublin
D07KT57

9 May 2023

Uisce Éireann
Bosca OP448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office
Cork City.

www.water.ie

**Our Ref: CDS23002687 Pre-Connection Enquiry
Dunlavin Fire Station, Near Dunlavin Waste Water, Treatment
Plant, Wicklow**

Dear Applicant/Agent,

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

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Business Connection of 1 unit(s) at Dunlavin Fire Station, Near Dunlavin Waste Water, Treatment Plant, Wicklow, (the **Development**).

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

- **Water Connection**
 - Feasible Subject to upgrades
 - To connect this development to Uisce Éireann's water network a network extension of approx. 120m of 100mm is required. The applicant will be responsible for the full cost of these upgrades.
- **Wastewater Connection**
 - Feasible without infrastructure upgrade by Irish Water
 - No issues noted

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water 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 Irish Water.

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/

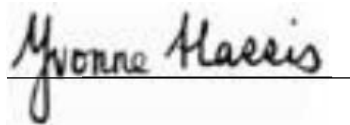
Where can you find more information?

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

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

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

Yours sincerely,

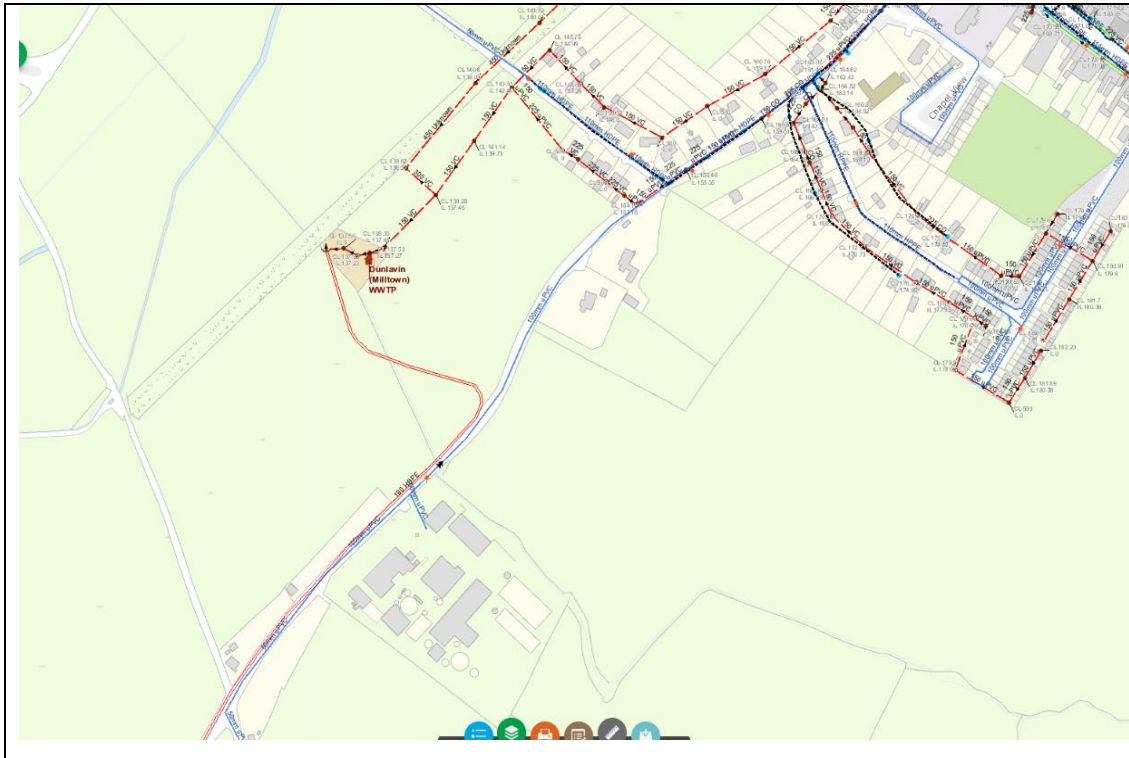
A handwritten signature in black ink that reads "Yvonne Harris". The signature is written in a cursive style and is positioned above a thin horizontal line.

Yvonne Harris
Head of Customer Operations

Section B – Details of Irish Water’s Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email

datarequests@water.ie



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Note: The information provided on the included maps as to the position of Irish Water’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 Irish Water.

Whilst every care has been taken in respect of the information on Irish Water’s network(s), Irish Water 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 Irish Water’s underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water’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.

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