Engineering Assessment Report

Proposed Large-Scale Residential Development at Kildalkey Road, Trim, Co. Meath.

June 2026

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This document has been prepared and checked in accordance with
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Comments

Issue No 2 – Stage 3 Large-Scale Residential Development

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1. Introduction

This report has been prepared by Waterman Moylan Consulting Engineers, on behalf of Loughglynn Developments, for a proposed large-scale residential development at Kildalkey Road, Trim, Co. Meath, situated approximately 1 km northwest of Trim town centre. This report describes the criteria used to design the stormwater discharge, disposal of foul water, water supply and vehicular access to the developed site. The proposal relates to a residential development of 183 No. residential units and 01 No. Creche.

1.1 Site Location and Description

The site is located on Kildalkey Road, Trim, Co. Meath. The site is situated approximately 1 km northwest of Trim town centre. The proposed development is bounded to the south by the river Boyne. The site is bound to the east by existing residential development, consisting of two-storey houses. The site is bound to the north by Kildalkey Road. To the west the site is bound by agricultural land. The proposed development will be accessed from Kildalkey Road.

The Gross site area including foul sewer route under River Boyne is 6.09 hectares. The proposed net site area is approximately 5.80 hectares within the proposed red line boundary. The current agricultural lands exhibit a general slope from the north to south towards the River Boyne, with existing ground levels ranging from 65.4m to 55.4m OD Malin within the proposed red line boundary. Access to the site is currently facilitated through an existing entrance located off the Kildalkey Road.

Please refer to Waterman Moylan drawing No. 23-041-P010 - Proposed Site Location Map for the exact site location and surrounding lands as outlined above.

Figure 1: Proposed Development Location

1.2 Description of the Proposed Development

The proposed development comprises a Large-Scale Residential Development (LRD) on lands at Crowpark (1st Division), Kildalkey Road, Trim, Co. Meath.

The scheme provides a total of 183 residential units, comprising 127 houses and 56 apartments. The housing mix includes 19 no. detached 4-bedroom houses, 9 no. semi-detached/end-terrace 4-bedroom houses, 4 no. detached 3-bedroom houses, 43 no. semi-detached/end-terrace 3-bedroom houses, and 52 no. mid-terrace 3-bedroom houses, with building heights from 2 to 2 ½ storeys. The apartment element comprises 56 no. units in two blocks of up to four storeys, including 16 no. one-bedroom and 40 no. two-bedroom units.

The development also includes a crèche facility, new vehicular and pedestrian accesses from Kildalkey Road.

The proposal provides for associated infrastructure and site works, including landscaping, public and communal open space, internal streets and footpaths, car and bicycle parking, bin stores, private open space, boundary treatments, plant and waste management areas, utility infrastructure and a foul sewer connection to the existing network adjoining the OPW offices on Jonathan Swift Street, to be delivered beneath the River Boyne and Trim Pitch & Putt.

The proposed road levels around the site, range from 65.056m to 56.289m. Additionally, the proposed finished floor levels for the units also range between 65.250m and 58.600m above the OD Malin.

In terms of access to the site, the proposed development will be accessed from Kildalkey Road to the north of the proposed development. Details can be seen in Waterman Moylan drawing No. 23-041-P100 - Proposed Road Layout & Levels.

The design and layout of the proposal have been prepared to fully comply with the current relevant design standards and specifications applicable to this form of development. The relevant design standards and specifications that the design and layout are comply with are Technical Guidance Documents, Section H, Uisce Eireann Standard Details and Codes of Practice (Water and Wastewater), SuDS Manual Ciria C753.

1.3 Background of Report and Summary

This report describes the criteria used to design and detail the options available for the disposal of foul water, disposal of storm water, water supply and roads network to serve the development site.

Surface Water from the subject site in its existing greenfield condition drains along the natural topography by means of local trenches to River Boyne traversing the subject site along the southern boundary.

The surface water drainage for the development has been designed with individual soakaways for each house unit and surface water from the public areas will be divided into four catchments, each discharging via gravity into separate underground soakaways. The proposed dwellings in the north will drain into the soakaway located at the centre of the site. Part of the proposed dwellings in the centre will drain into the soakaway to the south. The apartment block in the southwest will drains into the southwest soakaway, and the apartment block in the southeast will drain into the southeast soakaway.

The site will be served with a new foul sewer system, which will drain by gravity sewers to a proposed pump station located at the southeast of the site and will pump to the outfall into existing 225mm diameter foul sewer on Jonathan Swift Street.

It is proposed to facilitate water supply for the development by utilising an new connection from a 100mm HDPE watermain on Kildalkey Road to the north of the subject site. Details of the watermain layout are shown on Waterman Moylan Drawing No. 23-041-P300 - Proposed Watermain Layout.

It is proposed that the main entrance for the development will be via Kildalkey Road to the north of the subject site. Details are shown on Waterman Moylan drawing No. 23-041-P100 - Proposed Road Layout & Levels

2. Foul Water Drainage

2.1 Introduction

The site will be served with a new foul sewer system, which will drain by gravity sewers to a proposed pump station located at the southeast of the site and will pump to the outfall into existing 225mm diameter foul sewer on Jonathan Swift Street.

The proposed pumping station is confirmed to comply with Uisce Éireann's Wastewater Infrastructure Standard Details, connection application will be issued to Uisce Éireann for approval with pumping station included once planning is granted.

Waterman Moylan Drawing No. 23-041-P200 - Proposed Drainage Layout shows the proposed foul water sewer network for the subject site.

2.2 Uisce Éireann Pre-Connection Enquiry

Uisce Éireann Reg. Ref. CDS26001987

A pre-connection enquiry, Uisce Éireann Reg. Ref. CDS26001987, was submitted to Uisce Éireann on the 5th March, 2026 for the units pertaining to the development. A response from Uisce Éireann was received and Confirmation of Feasibility can be found in Appendix A with summary below.

Uisce Éireann have confirmed that a connection to the existing foul water infrastructure is feasible without infrastructure upgrade by Uisce Éireann. A survey will be required to determine the condition / Diameter / Invert levels at Discharge Point of the existing network and determine if capacity exists. If diameter is not 225mm ID at a minimum then an upgrade may be required. It is advised to contact Uisce Eireann prior to submission of connection application. Connection to the Networks may be through 3rd party lands and all relevant wayleaves and permissions would need to be obtained by the Client

Uisce Éireann Reg. Ref. CDS22008568

Existing capacity constraints are known to occur within the adjoining Eldergrove and Avondale housing developments due to surface water ingress into the foul sewer network. As identified within the Uisce Éireann Confirmation of Feasibility correspondence issued in 2023, the existing foul network in the area is subject to operational constraints associated with inflow and infiltration.

Extensive surveys and investigations have been undertaken to identify the source of the surface water ingress; however, the exact source could not be conclusively determined.

Following consultation with Uisce Éireann, it was concluded that the most feasible solution to facilitate the proposed development was to provide a pumped foul connection to the existing 225 mm diameter foul sewer located on Jonathan Swift Street.

The proposed foul rising main will be installed via Horizontal Directional Drilling (HDD) beneath the River Boyne in order to minimise environmental and infrastructural impacts.

Confirmation of feasibility for the proposed connection arrangement has been received from Uisce Éireann. In addition, the required consents and agreements associated with the HDD crossing have been obtained from the Office of Public Works (OPW) and Trim Pitch and Putt Club. Please refer to Appendix E, F & G for the Uisce Éireann Confirmation of Feasibility correspondence, OPW consent letter and Trim Pitch and Putt Club consent agreement

2.3 Foul Water – General

Foul water sewers within the proposed development will be laid to comply with the requirements of the Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Documents, Section H.

Foul water sewers which will be taken into charge will be laid strictly in accordance with Uisce Éireann's requirements for taking in charge.

In accordance with the Uisce Éireann "*Code of Practice for Wastewater Infrastructure*", 150mm nominal internal diameter sewers have been proposed for carrying wastewater from 20 properties or less; whilst 225mm nominal internal diameter have been proposed for carrying wastewater from more than 20 properties. Furthermore, where there are at least ten dwelling units connected, the 150mm diameter pipes are laid at a minimum gradient of 1:60 for up to nine connected dwelling units.

The pumping station has been located with a 20m separation distance from the nearest dwelling. This complies with Section 5.5 of the Uisce Éireann "*Code of Practice for Wastewater Supply"*, which states that a Type 3 pumping station require a minimum buffer zone of 15m.

2.4 Foul Water Calculations

The foul water drainage for the proposed development has been designed so that minimum cleansing velocities outlined in "Uisce Éireann`s Code of Practice for Wastewater Infrastructure" are achieved for all foul sewers. The peak foul flow is based on Uisce Éireann`s recommended peak demand/flow factors which are provided in the 'Code of Practice for Wastewater Infrastructure'. Pipe capacities and velocities have been calculated using the Colebrook-White formula with a roughness coefficient (Ks) of 1.5mm.

The estimated foul flows generated from the proposed development are as follows:

Table 1: Calculation of proposed Foul Water Flow

Description	No. of Units	Population per unit	PE	Flow l/hd/day	Infiltration Factor	Total Discharge (l/d)
Proposed Development						
Residential Units	183 Units	2.7	494.10	150	1.1	81,526.5
Creche	238sqm	4.2m^2/child 1 staff/8–11 children	60	90	1.1	5,940
Total						***87,466.5***

Calculation of Proposed Peak Foul Flow for proposed development		
Total Daily Discharge *(from Table 1.)*	87,466.5	l/d
Dry Weather Flow (DWF)	1.01	l/s

Peak Foul Flow (=6 x DWF)	***6.10***	***l/s***

The proposed foul outfall from the subject site is a 225 mm-diameter pipe laid at a gradient of 1:200, giving a capacity of 32 l/s and which therefore has adequate capacity to cater for the flows from the development.

2.5 Foul Water Pumping Station and Preliminary Specification

2.5.1 General

As set out in 2.1 above, it is proposed to construct a new pumping station at the southeastern side of the site. The pumping station will be sized to accommodate the proposed development as per the calculations below. The proposed pumping station will be designed in compliance with the Uisce Éireann Code of Practice and Uisce Éireann's Wastewater Infrastructure Standard Details.

The proposed pumping station will pump wastewater of the proposed foul network to the junction at Jonathan Swift Street. There is an existing wastewater network on the Jonathan Swift Street. Uisce Éireann have indicated in their COF that this existing network could be utilised for the proposed development feasible without infrastructure upgrade by Uisce Éireann. The proposed new pumping station will be designed to facilitate flows from the development

The proposed emergency storage to be provided for the pump station is calculated by utilising the following Uisce Éireann code of Practice table:

Houses	Storage Hours	Max Storage Volume (m^3)
0 – 250	24	112
250 - 333	24 for 250 and 18 thereafter	139
334 - 1667	24 for 250, 18 up to 333 and 12 thereafter	437
1668 - 3333	24 for 250, 18 up to 333, 12 up to 1667 and 10 thereafter	746

The proposed pump station has provision for foul water storage from the proposed development with a total capacity of 87.5 m^3 which has sufficient storage to cater the foul generated throughout the overall residential development in a period of 24 hours as required.

2.5.2 Pumping Chamber Design Criteria

The capacity of the pumping chamber has been based on the following design criteria:

Table 2: Pumping Station Design Criteria

Static Head	5.6	m
Rising Main	100	mm Ø
Length of Rising Main	288.61	m
Dry Weather Flow	1.011	l/sec

Based on the above, the volume of the foul rising main is 2.27 m³. At 1.01 l/s dry weather flow, this represents a retention time in the rising main of 0.62 hours (≈ 37.5 minutes). Therefore, there will be no septicity in the rising main.

2.5.3 Emergency Storage

The total volume of storage available in the pump sump to this level is c.3 m³ with a further 88m³ available in the adjacent storage tanks.

In addition there is storage available in the foul water manholes and sewers but this will not be required as the 24 hour storage as required is provided within the pump sump and adjacent storage tanks

At 1.01 l/sec (1*DWF) the total volume required to be stored in a 24-hour period is 88 m³, which is less than the emergency storage available.

2.5.4 Pumping Station Equipment to be provided

Mechanical and electrical equipment for the proposed pumping chamber is to be provided by an approved specialist contractor to include features as detailed on the pumping chamber drawings and to meet with Uisce Éireann requirements.

The following is a checklist of the equipment proposed (or similar approved).

Pump Sets

Two submersible pumps: one duty and one standby. The pumps are to be fitted with impellers capable of pumping 100-mm diameter solids. The pump motor is to be suitable for 400V/3ph/50Hz electricity power supply. The unit is fitted with over temperature protection, as well as mechanical seal monitoring.

The pumps shall be supplied complete with quick couple release mechanisms for removal and reinstallation of the pumps, 50mm diameter twin galvanised guide rails, holding brackets lifting chains etc.

Pipework & Valves

Pump pipework is to be 110mm ductile iron, complete with couplings, riser pipes, bends and tee pieces, tapers etc as required, all complete with flange sets, consisting of zinc plated nuts, bolts, washers and gaskets.

100mm-diameter cast iron non-return valves and gate valves complete with handwheels for clockwise closing as required.

Electrical Equipment

- Pump power cables complete with cable glands.
- Earth spike and bonding.
- ESB distribution board in kiosk.

Control Equipment Panel

Ultrasonic level controller, complete with 5 programmable output relays for automatic stop and start of pumps.

Ultrasonic transducer head complete with 10m of signal cable and mounting brackets.

Control panel containing the following: -

- Cyclic relay for alternating duty pump
- Ammeters
- Hour run meters
- Hand, off, Auto switches.
- Run/trip/alarm lights
- DI relays for seal monitoring
- High level alarm beacon

Control Kiosk

A control kiosk shall be provided adjacent to the pumping station.

2.5.5 Emergency Equipment and Procedures

The pumping station is being provided with the following emergency equipment and procedures: -

- Standby pump in the event of a pump failure
- Telemetry system to facilitate Uisce Éireann monitoring of the station
- High level alarms to warn of increases in level of effluent in the pump sump
- Storage capacity within the sump and pipe network in excess of 24 hours
- Over-pumping facilities on the rising main to facilitate the installation of a temporary external pump to empty the sump directly into the rising main

The above emergency equipment and procedures provide a very high level of redundancy and backup in the event of a failure in the mechanical systems in the pumping station when required.

3. Surface Water Drainage

3.1 Introduction

The surface water drainage for the development has been designed with individual soakaways for each dwelling and surface water from the public areas will be divided into four catchments, each discharging via gravity into separate underground soakaways. The proposed dwelling in the north will drain into the soakaway located at the centre of the site. Part of the proposed dwelling in the centre will drain into the soakaway to the south. The apartment block in the southwest will drain into the southwest soakaway, and the apartment block in the southeast will drain into the southeast soakaway. From each soakaway, water will naturally infiltrate into the ground.

The layout of the proposed surface water drainage network is shown on Waterman Moylan Drawing No. 23-041-P200 - Proposed Drainage Layout.

3.2 Surface Water – General

Sustainable Urban Drainage Systems (SUDS) have been developed and are in use to alleviate the detrimental effects of traditional urban storm water drainage practice that typically consisted of piping runoff of rainfall from developments to the nearest receiving watercourse. Surface water drainage methods that take account of quantity, quality and amenity issues are collectively referred to as sustainable urban drainage systems; they are typically made up of one or more structures built to manage surface water runoff.

The proposed surface water drainage system for this development has been designed as a sustainable urban drainage system and uses permeable pavement, grass swales, soakaway , filter drain and petrol interceptors to:

- Treat runoff and remove pollutants to improve quality
- Restrict outflow and to control quantity
- Increase amenity value

Strict separation of surface water and wastewater will be implemented within the development. Drains will be laid out to minimise the risk of inadvertent connection of waste pipes etc. to the surface water system.

Surface water local drains will be 150 mm to 225 mm wide and generally will consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6). These drains will be laid to comply with the requirement of the Building Regulations 2010, and in accordance with the recommendations contained in the Technical Guidance Documents, Section H.

Surface water public sewers will be 225 mm to 525 mm wide and generally will consist of PVC or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with the requirements of Meath County Council.

3.3 Proposed Surface Water Drainage Strategy

The surface water network for the proposed development has been divided into four separate catchments as shown in the following figure 2. It is proposed that surface water will drain by a network of gravity surface water pipes to the soakaway in each catchment.

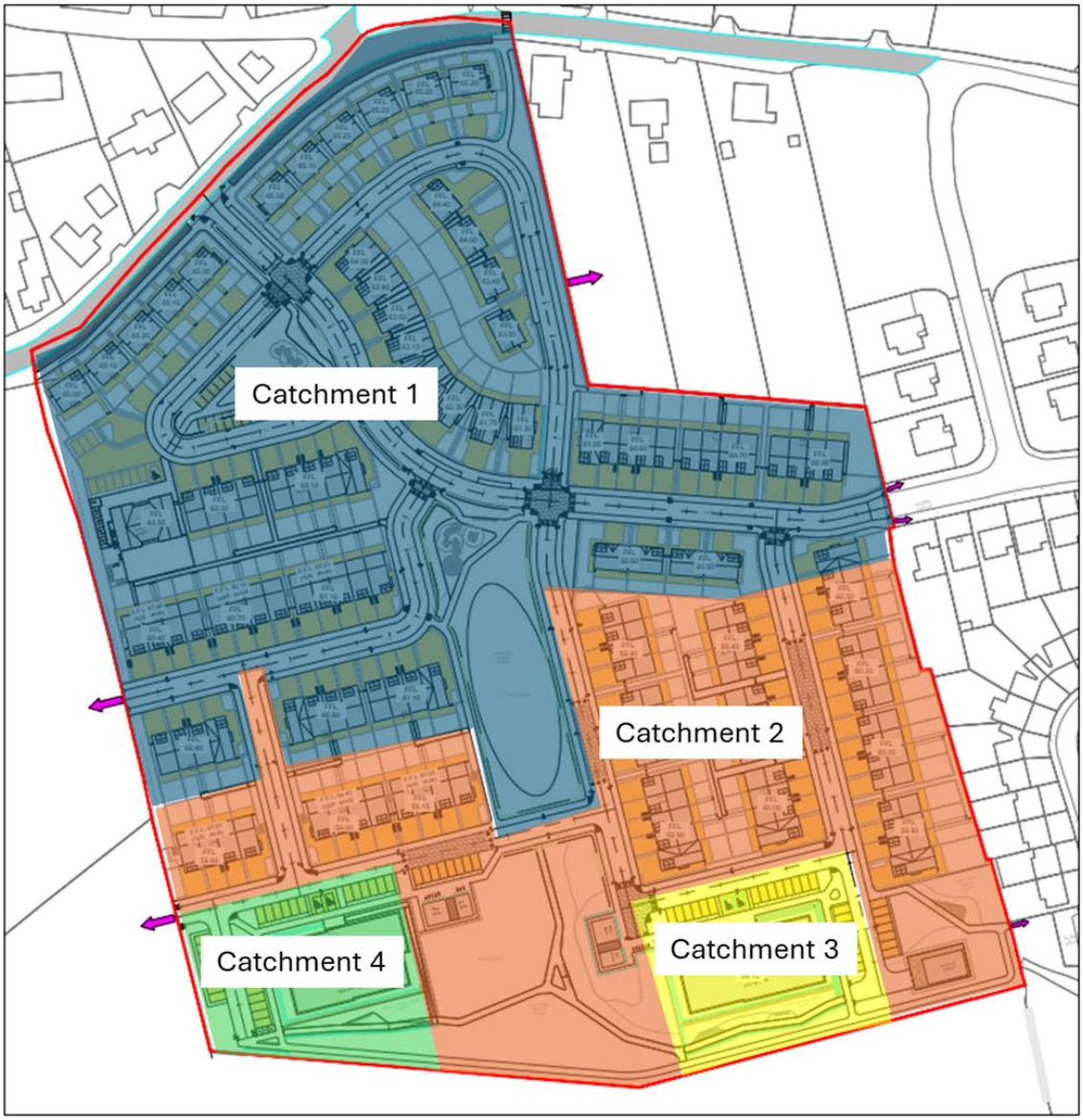


Figure 2: Catchment Division

The layout of the proposed surface water drainage network is shown on Waterman Moylan Drawing No. 23-041-P200 - Proposed Drainage Layout.

During site investigations, Petrifying Tufa springs, which constitute a protected habitat associated with the adjoining SAC, were identified within the wider study area. The presence of these features was identified through ecological assessment undertaken by Dr. Joanne Denyer.

Following identification of the Tufa springs, the proposed surface water drainage strategy was developed in consultation with Dr. Joanne Denyer and Dr. Robbie Meehan (Hydrologist) to ensure that the existing hydrological regime across the site and adjoining SAC is maintained.

The proposed drainage design has therefore been carefully developed to avoid any alteration to existing groundwater flows, seepage patterns, or hydrological conditions which could adversely impact the Petrifying Tufa habitat.

Accordingly, the proposed development is not expected to result in any hydrological impacts on the identified Tufa springs or the adjoining SAC. Please refer to Appendix H for the Petrifying Tufa Springs Walk-Over Survey prepared by Dr. Joanne Denyer.

Catchment 1

Catchment 1 is located to the north area of the site and covers a catchment area of c. 2.20 hectares. The total impermeable area is c. 1.05 hectares. The excess surface water for the 1 in 100-year storm + 20% climate change will outfall to the soakaway where it will naturally infiltrate to ground.

Catchment 2

Catchment 2 is located at the central and south area of the site and covers a catchment area of c. 1.28 hectares. The impermeable area is approximately 0.52 hectares. The excess surface water for the 1 in 100-year storm + 20% climate change will outfall to the soakaway where it will naturally infiltrate to ground.

Catchment 3

Catchment 3 is located at the southeast area of the site and covers a catchment area of c. 0.34 hectares. The impermeable area is approximately 0.22 hectares. The excess surface water for the 1 in 100-year storm + 20% climate change will outfall to the soakaway where it will naturally infiltrate to ground.

Catchment 4

Catchment 4 is located at the southwest area of the site and covers a catchment area of c. 0.36 hectares. The impermeable area is approximately 0.23 hectares. The excess surface water for the 1 in 100-year storm + 20% climate change will outfall to the soakaway where it will naturally infiltrate to ground.

3.4 Site Characteristics

The following table shows the site characteristics used for the design of surface water drainage for the development.

Table 3: Surface Water Catchment Details

	C 1		C 2		C 3	C 4
	Catchment area except roofs and permeable paving	Roofs and permeable paving	Catchment area except roofs and permeable paving	Roofs and permeable paving		
Catchment Area – Ha	2.20	1.00	1.28	0.62	0.34	0.36
Impermeable Area - Ha	1.05	0.89	0.52	0.56	0.22	0.23
Percentage Impermeable - %	47.8	89	40.9	0.90	65.1	62.4
SAAR - mm	860	860	860	860	860	860
SOIL Index	0.30					
Climate Change	20%					

Hardstanding area for the development includes the roads, footpath, cycle path, parking spaces, included as part of this planning application, and the gross floor area. Roof areas in Catchments 1 and 2 (c.0.94 ha in total) will infiltrate via individual house soakaways at the back of each house, and the permeable paving areas (c.0.68 ha in total) will infiltrate directly to ground. Therefore, these areas are excluded from Table 3.

Details of the drainage layout can be seen on Waterman Moylan's Drawing No. 23-041-P200 - Proposed Drainage Layout.

3.5 Storm Water Calculations

The total impermeable area of the proposed design including roads, footpaths, car-parking and roofs, is c. 3.47 ha. It is proposed that the 1 in 100-year critical design storm, plus an additional 20 per cent for climate change, will be used for soakaway sizing calculations.

Calculations for pipe sizes and gradients are based on storm water runoff from the roofs and surfaced areas using the Rational Method for surface water design (Bilhams Formula), with a storm return period (N) of 5 years.

Pipe capacities and velocities have been calculated using Colebrook-White formula with a roughness coefficient (Ks) of 0.6mm.

The total impermeable area for the subject site set out above was used in the FLOW calculations for the design of the surface water system which are included in Appendix B.

It is proposed that the surface water from the development will drain via gravity and discharge to soakaways located inside each catchment of the subject site.

Details of the drainage layout can be seen on Waterman Moylan's Drawing No. 23-041-P200 - Proposed Drainage Layout.

Soakaway design calculations are included in Appendix C of this report.

3.6 Sustainable Drainage System (SuDS) Selection Criteria

The SuDS selection process used for this site is in accordance with SuDS selection flow chart, Volume 3, Section 6.5, Figure 48 of the GDSDS. The characteristics of the site are utilised to select the various SuDS techniques that would be applicable.

The applicant has considered the use of all appropriate SuDS devices as part of the site SuDS strategy.

- Permeable Pavement
- Swales - utilised in grass verges alongside internal roads
- Soakaway – located in the rear gardens of the houses and the green open space areas
- Petrol Interceptor
- Filter Drain

The effectiveness of each SuDS/drainage mechanism proposed is outlined below:

Management Train:

The management train commences with **source control** through the provision of filter drains.

The second stage of the management train, **site control**, is provided by the introduction of swales, all of which provide a degree of treatment before discharging to the soakaways from where it will percolate to ground naturally.

The SuDS strategy has also been developed to maintain the existing hydrological regime within the adjoining SAC and avoid impacts on the identified Petrifying Tufa springs.

Permeable Pavement:

Permeable pavements are alternative paving surfaces to standard finishes that allow stormwater run-off to filter through voids in the pavement surface into an underlying stone reservoir, where it is infiltrated into the ground.

Permeable paving will be utilised for the on-curtilage car parking area to provide treatment and storage to rainwater falling on these areas.

Swales:

Swales has been incorporated adjacent to the roads at different areas where possible throughout the proposed development. It is intended to drain roadways to swales where appropriate. The swales incorporate an infiltration trench at the invert of the swales which will encourage surface water to drain direct to ground as recommended by SUDS. Any remaining water which does not filtrate direct to ground will drain to the surface water network.

Soakaway:

Soakaway testing was performed by Traynor Environmental Ltd attached in the Appendix D. The testing was completed in accordance with BRE Digest 365 to ascertain the suitability of the sub-soils for soakaway purposes. The test was completed in sixteen parts of the site, the results presented in Appendix D indicate that the soil conditions demonstrate good infiltration characteristics.

Petrol Interceptor:

A petrol interceptor is a trap used to filter out hydrocarbons such as petroleum from rainwater runoff. It is typically used in road construction to prevent fuel contamination of water courses carrying away the runoff. Petrol Interceptors work on the premise that some hydrocarbons such as petroleum and diesel float on the top of water. The contaminated water enters the interceptor typically after flowing off roads and entering a channel drain before being deposited into the first tank inside the interceptor. The first tank builds up a layer of hydrocarbon as well as other scum preventing it from entering the water course.

3.7 SUDS Maintenance Section

In order to comply with the Meath County Development Plan 2021-2027 “Development Design Standards,” it is proposed to:

- Separate foul and surface water
- Include appropriate on-site disposal of surface water
- Comply with the standards set out in the GDSDS
- Implement appropriate SUDS measures

All SUDS measures included will be designed in accordance with the CIRIA SUDS Manual C753 as required by the GDSDS adopted by Meath County Council and the other Local Authorities in the Greater Dublin Area.

For the proposed SuDS strategy to work as designed it is important that the entire drainage system is well maintained. It will be the responsibility of the site management team to ensure the drainage system is maintained during the construction stage and initial plots of occupation. The management company who will be employed to maintain the site will be required to ensure maintenance of the SuDS features as part of their role. This will include maintenance and cleaning of gullies, drain manholes (including catch pits) and the soakaway to ensure adequate performance. The recommended program is outlined in the tables below.

Table 4: Swale Maintenance Schedule

	Maintenance period	Maintenance Task	Frequency
Swale	Regular	Remove the litter and debris	Monthly, or as required
		Cut grass – to retain height within specified design range.	Monthly (during growing season), or as required
		Manage other vegetation and remove nuisance plants.	Monthly at start, then as required
		Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
		Inspect infiltration coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
		Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
	Occasional	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if soil is exposed over 10% or more of the swale treatment area
	Remedial actions	Repair erosion or other damage by re-turfing or re-seeding	As required
		Re-level uneven surfaces and reinstate design levels	As required
		Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
		Remove and dispose of oils or petrol residues using safe standards practices	As required

Filter Drain Maintenance:

Filter drains will require regular maintenance to ensure continuing operation to the design standards, and designers should provide detailed specifications and frequencies for the required maintenance activities. Regular inspection is important for the effective operation of these drains. Adequate access should always be provided for inspection and maintenance to be carried out.

The full advised maintenance tasks to be carried out by the property owner are summarized in the table below.

Table 5: Filter Drains Maintenance Schedule

SUDS Element	Maintenance		
Filter Drains	Maintenance period	Maintenance Task	Frequency
	Regular	Removing litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Six monthly (or as required)
		Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Six monthly
		Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
		Remove sediment from pre-treatment devices	Six monthly (or as required)
	Occasional	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g. NJUG 2007 or BS 3998:2010)	As required
		At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly (or as required)
		Clear perforated pipework from blockages	As required

Table 6: Soakaway Maintenance Schedule

SUDS Element	Maintenance		
Soakaway	Maintenance period	Maintenance Task	Frequency
	Regular	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
		Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
		Trimming any roots that may be causing blockages	Annually (or as required)

	Occasional	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
	Remedial work	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
		Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
	Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
		Check soakaway to ensure emptying is occurring	Annually

Table 7: Permeable Paving Maintenance Schedule

SUDS Element	Maintenance		
Permeable Paving	Maintenance period	Maintenance Task	Frequency
	Regular	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or as required, based on site specific observations of clogging or manufacturer's recommendations.
	Occasional	Removal of weeds	As required
	Remedial work	Remediation work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users	As required
	Monitoring	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	Annually

3.7.1 Petrol Interceptor

Petrol Interceptor Maintenance should be carried out in accordance with British Standards BS EN 858-2:2003 Separator system for light liquids (e.g. oil and petrol – Part 2:selection of nominal size, installation, operation and maintenance which provides specific guidance on how to maintain petrol interceptors.

The above mentioned standard states the following:

“All parts which have to be regularly maintained shall be at all times reachable. Maintenance if the systems has to be carried out at least every six months by experience personnel. The maintenance shall be carried out in accordance with the manufacturer’s instructions, but at least shall include the following

a) sludge trap

• determination of sludge volume

b) separator

• measure the thickness of light liquids

• check the operation of the automatic closure device

• check the coalescing devices for permeability, if the water levels in front and behind the coalescing device show significant difference

• check the function of the warning device

c) sampling shaft

• clean the drain channel

Light liquid and sludge shall be removed as required. Before putting in service sludge trap and separator shall be re-filled with fresh water.

NOTE Emptying is recommended when one half of the sludge volume or 80 % of the storage capacity of the separator is reached.

In exceptional circumstances, when personnel need to enter the separator, it shall be fully drained and thoroughly ventilated.

In intervals of at maximum five years the separator system shall be emptied and then submitted to general inspection covering the following items:

• tightness of the system;

• structural condition;

• internal coatings, if present;

• state of inbuilt parts;

• state of electrical devices and installations;

• checking of adjustment of automatic closure device, e.g. floating bodies.

Oil/Petrol interceptor maintenance should be conducted by experienced personnel at least every 6 months. Usually, an interceptor service will not be necessary every 6 months and an interception inspection will be sufficient to fulfil this requirement.

This should also include a 5 year integrity check.

3.8 OPW Culvert

During the pre-planning meetings in respect of this application Meath County Council raised an issue regarding an existing OPW culvert in the adjacent housing development to the east of the subject site. It was noted that the existing culvert is in very poor condition and due to its location in back gardens would require a new culvert to be constructed. In this regard it was suggested that the new culvert should pass through the subject site and that an appropriate wayleave be provided.

The location of the existing culver together with the suggested new route for the culvert with associated wayleave is shown in Figure 3 below

Figure 3:Existing Culvert and Proposed New Route Suggested by Meath Co Co

The applicant researched the existing culvert and carried out a CCTV survey on the culvert to ascertain its condition. It was noted from the CCTV that the culvert is in very poor condition and likely to collapse. The specialist contractors who undertook the CCTV advised that the culvert could be relined which would ensure that the culvert does not collapse. They also noted that the relining would increase the current capacity of the culvert. This provides an immediate measure to address the condition of the culvert and to make it safe.

The applicant also investigated the possibility of installing a new culvert within the estate which is benefitting from the culvert. In this regard a detailed Ground Penetration Radar (GPR) survey was carried out to locate the position of all buried services. Following receipt of the GPR survey a design was prepared to demonstrate that the culvert could be installed within the existing estate. Please refer to enclosed drawing No's TRIM-WMC-ZZ-XX-DR-C-S001 and TRIM-WMC-ZZ-DR-C-S002 which provides details of the design through the existing estate.

All of the above information was shared with Meath County Council during the planning process however Meath County Council still required that a wayleave be provided through the subject site to allow the future construction of a new culvert through the proposed development. In this regard a design was prepared for the culvert to pass through the subject site and a was wayleave determined for this culvert. Please refer to attached drawing No. TRIM-WAT-ZZ-XX-DR-C-P501 which shows the design for the future culvert through the site and associated wayleave. This route has been agreed with Meath County Council and the wayleave shown will be provided within the proposed development. It has been concluded by Meath County Council that the wayleave is sufficient to facilitate the future installation of the culvert through the subject site should this be required. A copy of the correspondence confirming same is attached in Appendix I.

3.9 Engagement with Meath County Council Drainage Department

In preparing this planning application Waterman Moylan engaged with Mr Damien O'Brien of Meath County Council in respect of the surface water drainage design. In addition to the issue of the culvert noted above Meath County Council also had concerns regarding the potential presence of rock which might impact upon the ability of the primary soakaway serving Catchment No. 1 to function properly. In this regard it was noted that the trial holes in the area of the soakaway serving catchment no. 1 were terminated at 1m and 1.5m below ground level.

To address this concern the applicant has carried out 4 additional trail holes within the area serving catchment no. 1. The location of these additional trial holes is presented in Figure 4 below

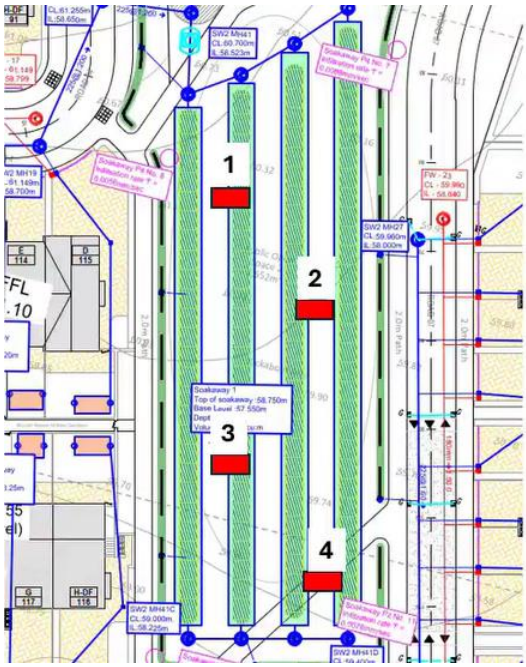


Figure 4: Location of Additional Trial Holes (Numbered 1 to 4 and labelled with a red rectangle)

The trial holes were carried out on Wednesday 24 June 2006. Each of the trial holes was excavated to 2.2m below ground level. There was no rock encountered. A brief description of the findings together with photographic records of the trial holes are presented in Appendix K

4. Water Supply

4.1 Introduction

Water supply to the subject site will be provided via a new proposed connection to the existing 100mm HPPE watermain on Kildalkey Road to the north of the site. Please refer to Waterman Moylan Drawing No. 23-041-P300 - Proposed Watermain Layout for details of the watermain layout to serve the subject site.

4.2 Water Supply – General

Water Mains suitable for Works and approved by Uisce Éireann shall be either ductile iron (DI) or polyethylene (PE), with PE80 or PE100 rating (MDPE, HDPE or HPPE).

The minimum depth of cover from the finished ground level to the external crown of a Water Main shall be 900mm. A greater depth of cover and/or greater strength pipe and/or a higher class of bedding may be required where high traffic loading is anticipated. Depths may be altered to avoid obstructions, including separation distances between other utility services. The desirable maximum cover for a Service Connection pipe or a Water Main should be 1200mm, where practicable.

Sluice valves will be provided so that no more than 40 houses can be isolated at any time and hydrants provided so that each part of the dwellings are within 46 meters of a hydrant.

A pre-connection enquiry, Uisce Éireann Reg. Ref. CDS26001987, was submitted to Uisce Éireann on the 5th March, 2026 for the units pertaining to the development. A response from Uisce Éireann was received and Confirmation of Feasibility can be found in Appendix A.

Uisce Éireann have confirmed that a connection to the existing water infrastructure is feasible, subject to upgrade works. Upgrade works are required to increase the capacity of the Uisce Éireann network. Approximately 250m of new 150mm ID watermain is to be laid to replace the existing 75/100mm PVC main. These works are not currently on the Uisce Eireann investment plan therefore, the applicant will be required to fund these local network upgrades. The fee will be calculated at connection application stage

It is proposed to connect the site to the existing 100 mm diameter watermain located at the northern boundary.

Please refer to Waterman Moylan Drawing No. 23-041-P300 - Proposed Watermain Layout for details of the watermain to serve the subject lands.

4.3 Water Demand Calculation

Water calculations providing details of the anticipated water consumption for the proposed development are illustrated in Table 8 below.

Table 8: Total Water Demand

Description	No. of Units	Population per Unit	PE	Flow l/h/day	Total Discharge (l/d)
Residential Units	183	2.7	494.10	150	74,115
Creche	1	4.2m^2/child 1 staff/8–11 children	60	90	5,400
Total					**79,515**

The total water requirement from the public supply, for the development, is estimated at 79.52 m^3/day.

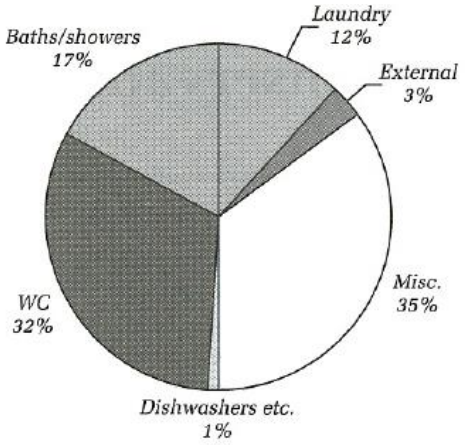
4.4 Water Conservation

The water demand for the development can be subdivided as follows:

- Potable / Non-potable Breakdown

Detailed studies have quantified the breakdown between potable and non-potable uses for residential uses.

The following diagram illustrates the current percentage breakdown of water usage in domestic circumstances and is from Griggs and Shouler 1994 as published in Chapter 11 of 'Water, Sanitary & Waste Services for Buildings' by Wise and Sheffield, remains the state-of-the-art.



In addition, water conservation measures will be used, to further reduce overall water demand, including:

- Low volume flush / dual flush WC's
- Aerated shower heads
- Spray Taps
- Draw off tap controls
- Leak detection measures – through the metering of supply

5. Transport

5.1 Introduction

A separate Traffic and Transport Assessment has been carried out and is included as part of this submission under separate cover and should be read in conjunction with this report.

5.2 Site Access

The proposed development relates to the construction of a Residential Development on residentially zoned lands located west of Trim town centre. Access to the subject site will be provided through the proposed junction located on Kildalkey Road to the north of the subject site. Please refer to Waterman Moylan Drawing No 23-041-P100 - Proposed Road Layout & Levels for the location of the site acess

The site access is located within 50 km/h zones. A 2.4m x 45m sightline, which is in compliance with the requirements of the Department of Transport 'Design Manual for Urban Roads and Streets' recommendation for a road of design speed of 50 km/h, can be provided at the access point. Please refer to Moylan Drawing No. 23-041-P130 - Proposed Sightlines for details of the sightlines provided. The second stop is approximately 1.30km from the site and accessible through a 15-minute walk. This stop is served by route 111 northbound

5.3 Bus Services

The nearest bus stops serving the Subject Development are situated on the R154 (Athboy Road). The bus stop is approximately 950 metres from the Site and accessible through a 13-minute walk; it is served by bus route 111 southbound. The second closest bus stop is approximately 1.30km from the site and accessible through a 15-minute walk. This stop is served by route 111 northbound

Figure 3 below illustrates the locations of the Bus Stops and their respective walking distances to the Development. Table 9 below shows the Bus Frequencies for the Bus route in the area.

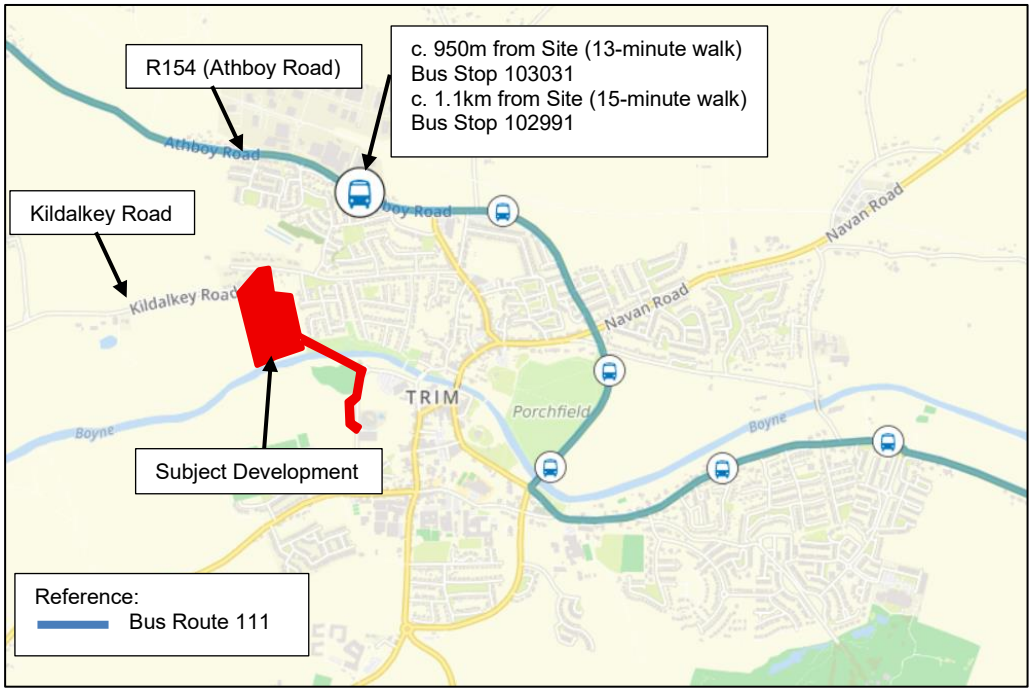


Figure 5: Location of Closest Bus Stops (Source: Transport for Ireland)

Bus Route	Direction	Weekday frequency	Saturday Frequency	Sunday / Bank Holiday Frequency
111	Cavan – Granard – Trim – Wilton Tce (Dublin)	Every 60 minutes between 6:00 and 22:00 Additional services are provided at 7:05 and 7:25	Every 60 minutes between 6:00 and 22:00	Every 130 minutes between 6:50 and 9:00 Every 60 minutes between 9:00 and 22:00
	Wilton Tce (Dublin) – Trim – Granard - Cavan	Every 60 minutes between 8:20 and 00:10. Additional services are provided at 18:26, 19:22, and 19:43.	Every 60 minutes between 8:10 and 00:00	Every 120 minutes between 9:10 and 11:10 Every 60 minutes between 11:10 and 00:10

Table 9: Bus Routes – Frequency Table (Source: Transport for Ireland)

The timetable above outlines expected arrival times at the bus stops referenced in Figure 3 above, with a margin for potential delays of up to two minutes.

5.4 Road Design

Roadways

The roads throughout the development are to be 5m to 6m wide as standard. Gradients vary from 1 in 20 to 1 in 150. Road levels within the range of 65.056 meters to 56.289 meters OD Malin. Turning radii at internal junctions are between 3m and 4.5m throughout the site. Roads layout and design has been carried out in accordance with Design Manual for Urban Roads and Streets “DMURS”, published by Department of Transport.

Pedestrian Facilities

The following pedestrian facilities are to be provided as part of the proposed development:

- The provision of a 2 m wide footpath on all residential roads throughout the development.
- The provision of appropriate road crossing points throughout the development with dropped kerbs and tactile paving.
- The Provision of a 2.5m wide cyclepath & 2, wide pedestrian path along the main linkage street within the proposed development.

The pedestrian facilities have been designed in accordance with DMURS. The provision of appropriate road crossing points throughout the development with dropped kerbs and appropriate tactile paving fully complies with the DMURS. Below is an analysis of walking isochrone from the proposed site considering a 20-minute walk, starting point taken at the entrance of the proposed site on Kildalkey Road.

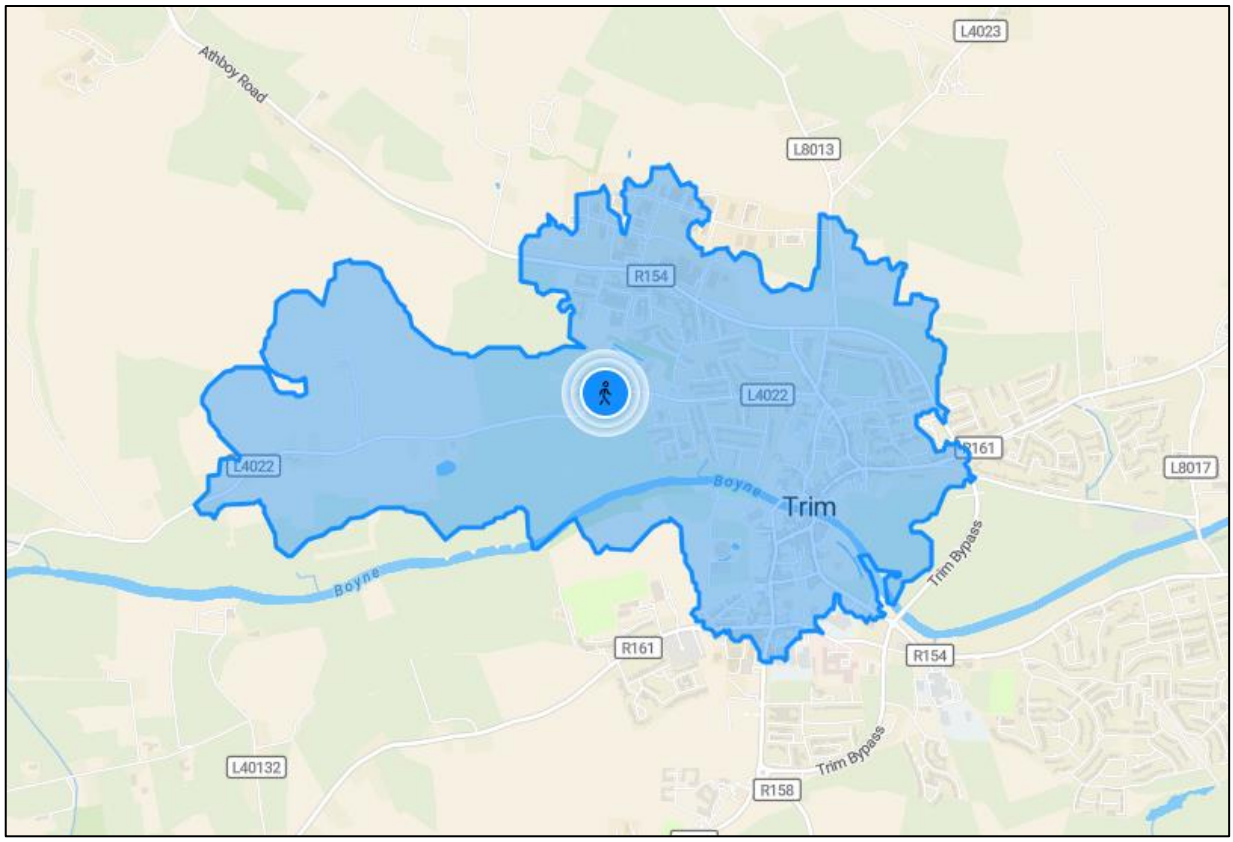


Figure 6: Isochrone for Walking (20min)

Cycle Facilities

It is proposed to provide cycle paths on the entrance juntion through the development. Share surface for Cyclist, pedestrians and vehicles is proposed on the rest of the internal road network. The cycle facilities have been designed in accordance with the National Cycle Manual by National Transport Authority (NTA).

Similar to above, below is the cycling isochrone for the site area for a 10-minutes cycle.

Figure 7: Isochrone for Cycling (10min)

APPENDICES

A. Confirmation of Feasibility

CONFIRMATION OF FEASIBILITY

Sidharth Kurella

Block S
Alfie Byrne Road
Eastpoint Business Park
Dublin
D03H3F4

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

23 April 2026

Our Ref: CDS26001987 Pre-Connection Enquiry
Kildalkey Road, Trim, Meath

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 Housing Development of 180 unit(s) at Site At, Kildalkey Road, Trim, Meath, (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 Premises, upgrade works are required to increase the capacity of the Uisce Eireann network. Approximately 250m of new 150mm ID watermain is to be laid to replace the existing 75/100mm PVC main (See Image below). These works are not currently on the Uisce Eireann investment plan therefore, the applicant will be required to fund these local network upgrades. The fee will be calculated at connection application stage.
- **Wastewater Connection**
  - Feasible without infrastructure upgrade by Uisce Éireann

Stiúrthóirí / Directors: Jerry Grant (Cathaoirleach / Chairperson), Niall Gleeson (POF / CEO), Douglas Millican, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh, Rena O'Sullivan and Orlagh Nevin.
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

- A survey will be required to determine the condition/Diameter/Invert levels at Discharge Point of the existing network and determine if capacity exists. If Dia is not 225mm ID at a minimum then an upgrade may be required. You are advised to contact Uisce Eireann prior to submission of connection application.

  Connection to the Networks may be through 3rd party lands and all relevant wayleaves and permissions would need to be obtained by the Client.

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

Dermot Phelan
Connections and Developer Services

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 and be granted and sign 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 ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** 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

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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.

B. Surface Water Flow Model

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	15.800	Minimum Backdrop Height (m)	0.200
Ratio-R	0.296	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
1	0.023	4.00	64.531	1200	679338.598	757333.041	1.443	63.088
2	0.042	4.00	64.702	1200	679320.238	757326.658	1.722	62.980
3	0.067	4.00	64.578	1200	679257.380	757264.987	1.425	63.153
5	0.083	4.00	64.898	1200	679265.287	757314.313	1.425	63.473
6	0.007	4.00	64.254	1200	679285.344	757294.980	1.506	62.748
7	0.018	4.00	63.605	1200	679296.712	757281.810	1.553	62.052
8	0.048	4.00	63.365	1200	679238.742	757244.224	1.425	61.940
10	0.045	4.00	62.942	1200	679291.487	757257.834	1.457	61.485
11	0.085	4.00	62.752	1200	679304.308	757264.112	1.545	61.207
12	0.030	4.00	62.127	1200	679315.602	757247.524	1.547	60.580
13	0.043	4.00	61.712	1200	679327.972	757238.058	1.521	60.191
14	0.022	4.00	64.231	1200	679353.108	757327.731	1.425	62.806
15	0.047	4.00	62.190	1200	679365.970	757271.947	1.429	60.761
16	0.034	4.00	60.751	1200	679444.362	757225.066	1.425	59.326
17	0.133	4.00	60.722	1200	679363.199	757230.624	1.804	58.918
18	0.014	4.00	60.295	1200	679251.133	757175.314	1.225	59.070
19	0.196	4.00	61.149	1200	679320.297	757192.833	2.436	58.713
20	0.019	4.00	61.509	1200	679320.429	757224.331	2.083	59.426
21	0.000	4.00	61.255	1200	679325.312	757201.554	2.605	58.650
22	0.476	4.00	60.700		679335.321	757202.510	2.177	58.523
23	0.071	4.00	60.469	1200	679430.517	757210.413	1.425	59.044
Dummy	0.037	4.00	60.164	1200	679437.559	757182.289	1.603	58.561
25	0.022	4.00	59.631	1200	679450.960	757127.408	2.012	57.619
26	0.013	4.00	58.307	1200	679385.002	757110.914	1.497	56.810
27	0.102	4.00	59.960	1200	679364.418	757192.764	1.960	58.000
28	0.008	4.00	58.872	1200	679377.939	757139.176	1.793	57.079
29	0.087	4.00	59.527	1200	679279.826	757146.894	1.426	58.101
30	0.010	4.00	58.676	1200	679286.902	757116.917	1.826	56.850
31	0.061	4.00	58.886	1200	679318.490	757124.933	2.274	56.612
33	0.048	4.00	58.707	1200	679455.355	757110.413	1.425	57.282
34	0.022	4.00	57.759	1200	679461.368	757086.128	1.200	56.559
35	0.028	4.00	57.766	1200	679444.887	757081.531	1.293	56.473
36	0.040		56.500		679422.986	757082.110	0.575	55.925
37	0.039	4.00	57.755	1200	679266.310	757102.881	1.589	56.166
38	0.034	4.00	56.289	1200	679272.997	757075.795	1.054	55.235
39	0.041	4.00	56.225		679288.170	757073.431	1.062	55.163
41	0.289	4.00	57.500		679357.961	757085.582	0.859	56.641

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
Dummy Outfall 2			59.034	1200	679380.506	757003.962	2.816	56.218
Dummy Outfall			60.700	1200	679339.515	757191.574	2.236	58.464
PP1	0.078	4.00	64.187		679336.669	757336.113	0.250	63.937
PP2	0.064	4.00	64.578		679251.543	757270.214	0.250	64.328
PP3	0.065	4.00	63.446		679285.433	757299.606	0.250	63.196
PP4	0.109	4.00	63.365		679233.551	757240.648	0.250	63.115
PP5	0.055	4.00	60.183		679243.911	757180.532	0.250	59.933
PP6	0.179	4.00	60.164		679432.534	757184.321	0.250	59.914
PP7	0.068	4.00	59.565		679454.378	757126.202	0.250	59.315
PP8	0.057	4.00	58.415		679386.250	757107.905	0.250	58.165
PP9	0.220	4.00	58.676		679283.370	757114.056	0.250	58.426
PP10	0.050	4.00	58.872		679382.451	757140.866	0.250	58.622
37A		4.00	58.280	1200	679262.726	757110.943	1.305	56.975
pp11	0.049	4.00	58.676		679277.958	757123.162	0.250	58.426
pp12	0.097	4.00	60.751		679443.622	757230.268	0.250	60.501
31B			57.400	1200	679324.615	757103.690	0.899	56.501
32		4.00	59.035	1200	679359.775	757135.047	1.425	57.610

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
6.000	1	2	21.663	0.600	63.088	62.980	0.108	200.6	225	4.44	50.0
7.002	2	6	46.333	0.600	62.980	62.748	0.232	200.0	225	5.28	50.0
7.000	3	6	41.007	0.600	63.153	62.748	0.405	101.3	225	4.73	50.0
9.000	5	6	27.876	0.600	63.473	62.748	0.725	38.4	225	4.22	50.0
7.003	6	7	17.398	0.600	62.748	62.052	0.696	25.0	225	5.39	50.0
7.004	7	11	19.259	0.600	62.052	61.282	0.770	25.0	225	5.51	50.0
10.000	8	10	54.570	0.600	61.940	61.485	0.455	119.9	225	4.93	50.0
11.002	10	11	14.276	0.600	61.485	61.282	0.203	70.3	225	5.08	50.0
7.005	11	12	20.068	0.600	61.207	60.580	0.627	32.0	300	5.63	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
6.000	0.919	36.6	18.2	1.218	1.497	0.101	0.0	112	0.918
7.002	0.921	36.6	25.7	1.497	1.281	0.142	0.0	139	0.995
7.000	1.299	51.6	23.7	1.200	1.281	0.131	0.0	107	1.271
9.000	2.116	84.1	15.0	1.200	1.281	0.083	0.0	64	1.604
7.003	2.627	104.5	77.6	1.281	1.328	0.429	0.0	145	2.868
7.004	2.627	104.5	80.9	1.328	1.245	0.448	0.0	149	2.891
10.000	1.193	47.4	28.4	1.200	1.232	0.157	0.0	125	1.243
11.002	1.561	62.1	36.5	1.232	1.245	0.202	0.0	124	1.624
7.005	2.789	197.1	132.7	1.245	1.247	0.734	0.0	181	2.985

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
7.006	12	13	15.576	0.600	60.580	60.191	0.389	40.0	300	5.73	50.0
7.007	13	22	36.303	0.600	60.191	59.267	0.924	39.3	300	5.98	50.0
12.000	14	15	57.248	0.600	62.806	60.761	2.045	28.0	225	4.38	50.0
12.001	15	17	41.416	0.600	60.761	58.918	1.843	22.5	225	4.63	50.0
13.001	16	17	81.500	0.600	59.326	58.918	0.408	200.0	225	5.56	50.0
12.002	17	22	40.125	0.600	58.918	58.717	0.201	200.0	225	6.29	50.0
14.001	18	19	71.348	0.600	59.070	58.713	0.357	200.0	225	5.54	50.0
14.002	19	21	10.060	0.600	58.713	58.663	0.050	200.0	225	5.72	50.0
15.000	20	21	23.295	0.600	59.426	58.650	0.776	30.0	225	4.16	50.0
14.003	21	22	10.381	0.600	58.650	58.598	0.052	200.0	225	5.91	50.0
1.000	23	Dummy	28.992	0.600	59.044	58.561	0.483	60.0	225	4.29	50.0
1.001	Dummy	25	56.493	0.600	58.561	57.619	0.942	60.0	225	4.84	50.0
1.002	25	26	67.989	0.600	57.619	56.810	0.809	84.0	225	5.64	50.0
1.003	26	41	18.850	0.600	56.810	56.716	0.094	200.0	225	5.98	50.0
5.000	27	28	55.267	0.600	58.000	57.079	0.921	60.0	225	4.54	50.0
5.001	28	41	27.801	0.600	57.079	56.716	0.363	76.6	225	4.85	50.0
16.000	29	30	30.704	0.600	58.101	56.850	1.251	24.5	225	4.19	50.0
16.001	30	31	32.589	0.600	56.850	56.687	0.163	200.0	225	5.04	50.0
16.002	31	31B	22.109	0.600	56.612	56.501	0.111	200.0	300	5.37	50.0
21.000	33	34	25.018	0.600	57.282	56.559	0.723	34.6	225	4.19	50.0
21.001	34	35	17.110	0.600	56.559	56.473	0.086	200.0	225	4.50	50.0
21.002	35	36	21.909	0.600	56.473	55.925	0.548	40.0	225	4.67	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
7.006	2.493	176.2	138.2	1.247	1.221	0.765	0.0	201	2.748
7.007	2.515	177.8	145.9	1.221	1.133	0.808	0.0	208	2.795
12.000	2.482	98.7	3.9	1.200	1.204	0.022	0.0	30	1.216
12.001	2.772	110.2	12.4	1.204	1.579	0.069	0.0	51	1.847
13.001	0.921	36.6	23.6	1.200	1.579	0.131	0.0	131	0.976
12.002	0.921	36.6	60.1	1.579	1.758	0.333	0.0	225	0.938
14.001	0.921	36.6	12.6	1.000	2.211	0.070	0.0	91	0.837
14.002	0.921	36.6	48.0	2.211	2.367	0.266	0.0	225	0.938
15.000	2.396	95.3	3.4	1.858	2.380	0.019	0.0	29	1.131
14.003	0.921	36.6	51.5	2.380	1.877	0.285	0.0	225	0.938
1.000	1.691	67.2	12.9	1.200	1.378	0.071	0.0	66	1.310
1.001	1.691	67.2	52.0	1.378	1.787	0.288	0.0	149	1.862
1.002	1.427	56.8	68.4	1.787	1.272	0.379	0.0	225	1.454
1.003	0.921	36.6	81.0	1.272	0.559	0.449	0.0	225	0.938
5.000	1.691	67.2	18.5	1.735	1.568	0.102	0.0	80	1.449
5.001	1.495	59.5	28.9	1.568	0.559	0.160	0.0	110	1.483
16.000	2.652	105.4	15.8	1.201	1.601	0.087	0.0	58	1.918
16.001	0.921	36.6	66.2	1.601	1.974	0.367	0.0	225	0.938
16.002	1.108	78.3	77.2	1.974	0.599	0.427	0.0	243	1.256
21.000	2.231	88.7	8.7	1.200	0.975	0.048	0.0	47	1.425
21.001	0.921	36.6	12.6	0.975	1.068	0.070	0.0	91	0.837
21.002	2.074	82.5	17.7	1.068	0.350	0.098	0.0	71	1.663

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
22.000	37	38	27.899	0.600	56.166	55.235	0.931	30.0	225	4.19	50.0
22.001	38	39	14.375	0.600	55.235	55.163	0.072	200.0	225	4.45	50.0
1.004	41	Dummy Outfall 2	84.676	0.600	56.641	56.218	0.423	200.0	300	7.25	50.0
7.008	22	Dummy Outfall	11.712	0.600	58.523	58.464	0.059	200.0	300	6.46	50.0
7.000_1	PP1	1	3.627	0.600	63.937	63.877	0.060	60.0	150	4.05	50.0
8.000	PP2	3	7.835	0.600	64.328	64.196	0.132	59.4	50	4.21	50.0
10.000_1	PP3	6	4.627	0.600	63.196	62.923	0.273	16.9	50	4.07	50.0
11.000	PP4	8	6.304	0.600	63.115	63.009	0.106	59.5	50	4.17	50.0
14.000	PP5	18	8.910	0.600	59.933	59.792	0.141	63.2	50	4.24	50.0
2.000	PP6	Dummy	5.420	0.600	59.914	59.822	0.092	58.9	50	4.14	50.0
3.000	PP7	25	3.625	0.600	59.315	59.254	0.061	59.4	50	4.10	50.0
4.000	PP8	26	3.258	0.600	58.165	58.110	0.055	59.2	50	4.09	50.0
19.000	PP9	30	4.545	0.600	58.426	58.349	0.077	59.0	100	4.08	50.0
6.000_1	PP10	28	4.818	0.600	58.622	58.542	0.080	60.0	50	4.13	50.0
17.000	37A	30	24.903	0.600	56.975	56.850	0.125	200.0	225	4.45	50.0
18.000	pp11	30	10.908	0.600	58.426	58.242	0.184	59.3	50	4.29	50.0
13.000	pp12	16	5.254	0.600	60.501	60.406	0.095	55.3	100	4.08	50.0
20.000	32	31	42.506	0.600	57.610	56.687	0.923	46.1	225	4.37	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
22.000	2.398	95.4	7.1	1.364	0.829	0.039	0.0	41	1.410
22.001	0.921	36.6	13.3	0.829	0.837	0.074	0.0	94	0.849
1.004	1.108	78.3	162.1	0.559	2.516	0.897	0.0	300	1.122
7.008	1.108	78.3	343.5	1.877	1.936	1.901	0.0	300	1.122
7.000_1	1.301	23.0	14.1	0.100	0.504	0.078	0.0	85	1.364
8.000	0.627	1.2	11.5	0.200	0.332	0.064	0.0	50	0.652
10.000_1	1.184	2.3	11.8	0.200	1.281	0.065	0.0	50	1.231
11.000	0.627	1.2	19.8	0.200	0.306	0.109	0.0	50	0.651
14.000	0.607	1.2	10.0	0.200	0.453	0.055	0.0	50	0.632
2.000	0.630	1.2	32.4	0.200	0.292	0.179	0.0	50	0.655
3.000	0.627	1.2	12.4	0.200	0.327	0.068	0.0	50	0.652
4.000	0.628	1.2	10.3	0.200	0.147	0.057	0.0	50	0.653
19.000	1.004	7.9	39.7	0.150	0.227	0.220	0.0	100	1.031
6.000_1	0.624	1.2	9.0	0.200	0.280	0.050	0.0	50	0.648
17.000	0.921	36.6	0.0	1.080	1.601	0.000	0.0	0	0.000
18.000	0.628	1.2	8.9	0.200	0.384	0.049	0.0	50	0.652
13.000	1.038	8.2	17.6	0.150	0.245	0.097	0.0	100	1.066
20.000	1.932	76.8	0.0	1.200	1.974	0.000	0.0	0	0.000

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
6.000	21.663	200.6	225	Circular	64.531	63.088	1.218	64.702	62.980	1.497
7.002	46.333	200.0	225	Circular	64.702	62.980	1.497	64.254	62.748	1.281
7.000	41.007	101.3	225	Circular	64.578	63.153	1.200	64.254	62.748	1.281
9.000	27.876	38.4	225	Circular	64.898	63.473	1.200	64.254	62.748	1.281
7.003	17.398	25.0	225	Circular	64.254	62.748	1.281	63.605	62.052	1.328
7.004	19.259	25.0	225	Circular	63.605	62.052	1.328	62.752	61.282	1.245
10.000	54.570	119.9	225	Circular	63.365	61.940	1.200	62.942	61.485	1.232
11.002	14.276	70.3	225	Circular	62.942	61.485	1.232	62.752	61.282	1.245
7.005	20.068	32.0	300	Circular	62.752	61.207	1.245	62.127	60.580	1.247
7.006	15.576	40.0	300	Circular	62.127	60.580	1.247	61.712	60.191	1.221
7.007	36.303	39.3	300	Circular	61.712	60.191	1.221	60.700	59.267	1.133
12.000	57.248	28.0	225	Circular	64.231	62.806	1.200	62.190	60.761	1.204
12.001	41.416	22.5	225	Circular	62.190	60.761	1.204	60.722	58.918	1.579
13.001	81.500	200.0	225	Circular	60.751	59.326	1.200	60.722	58.918	1.579
12.002	40.125	200.0	225	Circular	60.722	58.918	1.579	60.700	58.717	1.758
14.001	71.348	200.0	225	Circular	60.295	59.070	1.000	61.149	58.713	2.211
14.002	10.060	200.0	225	Circular	61.149	58.713	2.211	61.255	58.663	2.367
15.000	23.295	30.0	225	Circular	61.509	59.426	1.858	61.255	58.650	2.380
14.003	10.381	200.0	225	Circular	61.255	58.650	2.380	60.700	58.598	1.877
1.000	28.992	60.0	225	Circular	60.469	59.044	1.200	60.164	58.561	1.378
1.001	56.493	60.0	225	Circular	60.164	58.561	1.378	59.631	57.619	1.787
1.002	67.989	84.0	225	Circular	59.631	57.619	1.787	58.307	56.810	1.272

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
6.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
7.002	2	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
7.000	3	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
9.000	5	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
7.003	6	1200	Manhole	Adoptable	7	1200	Manhole	Adoptable
7.004	7	1200	Manhole	Adoptable	11	1200	Manhole	Adoptable
10.000	8	1200	Manhole	Adoptable	10	1200	Manhole	Adoptable
11.002	10	1200	Manhole	Adoptable	11	1200	Manhole	Adoptable
7.005	11	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
7.006	12	1200	Manhole	Adoptable	13	1200	Manhole	Adoptable
7.007	13	1200	Manhole	Adoptable	22		Junction	
12.000	14	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
12.001	15	1200	Manhole	Adoptable	17	1200	Manhole	Adoptable
13.001	16	1200	Manhole	Adoptable	17	1200	Manhole	Adoptable
12.002	17	1200	Manhole	Adoptable	22		Junction	
14.001	18	1200	Manhole	Adoptable	19	1200	Manhole	Adoptable
14.002	19	1200	Manhole	Adoptable	21	1200	Manhole	Adoptable
15.000	20	1200	Manhole	Adoptable	21	1200	Manhole	Adoptable
14.003	21	1200	Manhole	Adoptable	22		Junction	
1.000	23	1200	Manhole	Adoptable	Dummy	1200	Manhole	Adoptable
1.001	Dummy	1200	Manhole	Adoptable	25	1200	Manhole	Adoptable
1.002	25	1200	Manhole	Adoptable	26	1200	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.003	18.850	200.0	225	Circular	58.307	56.810	1.272	57.500	56.716	0.559
5.000	55.267	60.0	225	Circular	59.960	58.000	1.735	58.872	57.079	1.568
5.001	27.801	76.6	225	Circular	58.872	57.079	1.568	57.500	56.716	0.559
16.000	30.704	24.5	225	Circular	59.527	58.101	1.201	58.676	56.850	1.601
16.001	32.589	200.0	225	Circular	58.676	56.850	1.601	58.886	56.687	1.974
16.002	22.109	200.0	300	Circular	58.886	56.612	1.974	57.400	56.501	0.599
21.000	25.018	34.6	225	Circular	58.707	57.282	1.200	57.759	56.559	0.975
21.001	17.110	200.0	225	Circular	57.759	56.559	0.975	57.766	56.473	1.068
21.002	21.909	40.0	225	Circular	57.766	56.473	1.068	56.500	55.925	0.350
22.000	27.899	30.0	225	Circular	57.755	56.166	1.364	56.289	55.235	0.829
22.001	14.375	200.0	225	Circular	56.289	55.235	0.829	56.225	55.163	0.837
1.004	84.676	200.0	300	Circular	57.500	56.641	0.559	59.034	56.218	2.516
7.008	11.712	200.0	300	Circular	60.700	58.523	1.877	60.700	58.464	1.936
7.000_1	3.627	60.0	150	Circular	64.187	63.937	0.100	64.531	63.877	0.504
8.000	7.835	59.4	50	Circular	64.578	64.328	0.200	64.578	64.196	0.332
10.000_1	4.627	16.9	50	Circular	63.446	63.196	0.200	64.254	62.923	1.281
11.000	6.304	59.5	50	Circular	63.365	63.115	0.200	63.365	63.009	0.306
14.000	8.910	63.2	50	Circular	60.183	59.933	0.200	60.295	59.792	0.453
2.000	5.420	58.9	50	Circular	60.164	59.914	0.200	60.164	59.822	0.292
3.000	3.625	59.4	50	Circular	59.565	59.315	0.200	59.631	59.254	0.327
4.000	3.258	59.2	50	Circular	58.415	58.165	0.200	58.307	58.110	0.147

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.003	26	1200	Manhole	Adoptable	41		Junction	
5.000	27	1200	Manhole	Adoptable	28	1200	Manhole	Adoptable
5.001	28	1200	Manhole	Adoptable	41		Junction	
16.000	29	1200	Manhole	Adoptable	30	1200	Manhole	Adoptable
16.001	30	1200	Manhole	Adoptable	31	1200	Manhole	Adoptable
16.002	31	1200	Manhole	Adoptable	31B	1200	Manhole	Adoptable
21.000	33	1200	Manhole	Adoptable	34	1200	Manhole	Adoptable
21.001	34	1200	Manhole	Adoptable	35	1200	Manhole	Adoptable
21.002	35	1200	Manhole	Adoptable	36		Junction	
22.000	37	1200	Manhole	Adoptable	38	1200	Manhole	Adoptable
22.001	38	1200	Manhole	Adoptable	39		Junction	
1.004	41		Junction		Dummy Outfall 2	1200	Manhole	Adoptable
7.008	22		Junction		Dummy Outfall	1200	Manhole	Adoptable
7.000_1	PP1		Junction		1	1200	Manhole	Adoptable
8.000	PP2		Junction		3	1200	Manhole	Adoptable
10.000_1	PP3		Junction		6	1200	Manhole	Adoptable
11.000	PP4		Junction		8	1200	Manhole	Adoptable
14.000	PP5		Junction		18	1200	Manhole	Adoptable
2.000	PP6		Junction		Dummy	1200	Manhole	Adoptable
3.000	PP7		Junction		25	1200	Manhole	Adoptable
4.000	PP8		Junction		26	1200	Manhole	Adoptable

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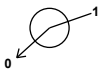
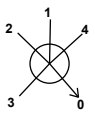
Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
19.000	4.545	59.0	100	Circular	58.676	58.426	0.150	58.676	58.349	0.227
6.000_1	4.818	60.0	50	Circular	58.872	58.622	0.200	58.872	58.542	0.280
17.000	24.903	200.0	225	Circular	58.280	56.975	1.080	58.676	56.850	1.601
18.000	10.908	59.3	50	Circular	58.676	58.426	0.200	58.676	58.242	0.384
13.000	5.254	55.3	100	Circular	60.751	60.501	0.150	60.751	60.406	0.245
20.000	42.506	46.1	225	Circular	59.035	57.610	1.200	58.886	56.687	1.974

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
19.000	PP9		Junction		30	1200	Manhole	Adoptable
6.000_1	PP10		Junction		28	1200	Manhole	Adoptable
17.000	37A	1200	Manhole	Adoptable	30	1200	Manhole	Adoptable
18.000	pp11		Junction		30	1200	Manhole	Adoptable
13.000	pp12		Junction		16	1200	Manhole	Adoptable
20.000	32	1200	Manhole	Adoptable	31	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
1	679338.598	757333.041	64.531	1.443	1200		1	7.000_1	63.877	150
							0	6.000	63.088	225
2	679320.238	757326.658	64.702	1.722	1200		1	6.000	62.980	225
							0	7.002	62.980	225
3	679257.380	757264.987	64.578	1.425	1200		1	8.000	64.196	50
							0	7.000	63.153	225
5	679265.287	757314.313	64.898	1.425	1200		0	9.000	63.473	225
6	679285.344	757294.980	64.254	1.506	1200		1	10.000_1	62.923	50
							2	9.000	62.748	225
							3	7.000	62.748	225
							4	7.002	62.748	225
							0	7.003	62.748	225
7	679296.712	757281.810	63.605	1.553	1200		1	7.003	62.052	225
							0	7.004	62.052	225

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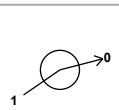
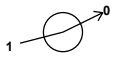
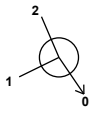
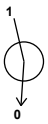
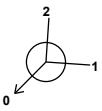
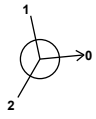
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
8	679238.742	757244.224	63.365	1.425	1200		1	11.000	63.009	50
							0	10.000	61.940	225
10	679291.487	757257.834	62.942	1.457	1200		1	10.000	61.485	225
							0	11.002	61.485	225
11	679304.308	757264.112	62.752	1.545	1200		1	11.002	61.282	225
							2	7.004	61.282	225
							0	7.005	61.207	300
12	679315.602	757247.524	62.127	1.547	1200		1	7.005	60.580	300
							0	7.006	60.580	300
13	679327.972	757238.058	61.712	1.521	1200		1	7.006	60.191	300
							0	7.007	60.191	300
14	679353.108	757327.731	64.231	1.425	1200		0	12.000	62.806	225
15	679365.970	757271.947	62.190	1.429	1200		1	12.000	60.761	225
							0	12.001	60.761	225
16	679444.362	757225.066	60.751	1.425	1200		1	13.000	60.406	100
							0	13.001	59.326	225
17	679363.199	757230.624	60.722	1.804	1200		1	13.001	58.918	225
							2	12.001	58.918	225
							0	12.002	58.918	225
18	679251.133	757175.314	60.295	1.225	1200		1	14.000	59.792	50
							0	14.001	59.070	225
19	679320.297	757192.833	61.149	2.436	1200		1	14.001	58.713	225
							0	14.002	58.713	225
20	679320.429	757224.331	61.509	2.083	1200		0	15.000	59.426	225
21	679325.312	757201.554	61.255	2.605	1200		1	15.000	58.650	225
							2	14.002	58.663	225
							0	14.003	58.650	225

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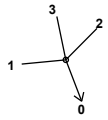
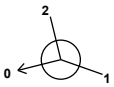
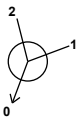
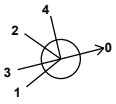
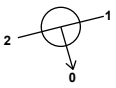
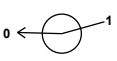
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
22	679335.321	757202.510	60.700	2.177			1 14.003	58.598	225
							2 12.002	58.717	225
							3 7.007	59.267	300
							0 7.008	58.523	300
23	679430.517	757210.413	60.469	1.425	1200		0 1.000	59.044	225
Dummy	679437.559	757182.289	60.164	1.603	1200		1 2.000	59.822	50
							2 1.000	58.561	225
							0 1.001	58.561	225
25	679450.960	757127.408	59.631	2.012	1200		1 3.000	59.254	50
							2 1.001	57.619	225
							0 1.002	57.619	225
26	679385.002	757110.914	58.307	1.497	1200		1 4.000	58.110	50
							2 1.002	56.810	225
							0 1.003	56.810	225
27	679364.418	757192.764	59.960	1.960	1200		0 5.000	58.000	225
28	679377.939	757139.176	58.872	1.793	1200		1 6.000_1	58.542	50
							2 5.000	57.079	225
							0 5.001	57.079	225
29	679279.826	757146.894	59.527	1.426	1200		0 16.000	58.101	225
30	679286.902	757116.917	58.676	1.826	1200		1 19.000	58.349	100
							2 18.000	58.242	50
							3 17.000	56.850	225
							4 16.000	56.850	225
							0 16.001	56.850	225
31	679318.490	757124.933	58.886	2.274	1200		1 20.000	56.687	225
							2 16.001	56.687	225
							0 16.002	56.612	300
33	679455.355	757110.413	58.707	1.425	1200		0 21.000	57.282	225
34	679461.368	757086.128	57.759	1.200	1200		1 21.000	56.559	225
							0 21.001	56.559	225
35	679444.887	757081.531	57.766	1.293	1200		1 21.001	56.473	225
							0 21.002	56.473	225

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
36	679422.986	757082.110	56.500	0.575		1	21.002	55.925	225
37	679266.310	757102.881	57.755	1.589	1200	0	22.000	56.166	225
38	679272.997	757075.795	56.289	1.054	1200	1	22.000	55.235	225
						0	22.001	55.235	225
39	679288.170	757073.431	56.225	1.062		1	22.001	55.163	225
41	679357.961	757085.582	57.500	0.859		1	5.001	56.716	225
						2	1.003	56.716	225
						0	1.004	56.641	300
Dummy Outfall 2	679380.506	757003.962	59.034	2.816	1200	1	1.004	56.218	300
Dummy Outfall	679339.515	757191.574	60.700	2.236	1200	1	7.008	58.464	300
PP1	679336.669	757336.113	64.187	0.250		0	7.000_1	63.937	150
PP2	679251.543	757270.214	64.578	0.250		0	8.000	64.328	50
PP3	679285.433	757299.606	63.446	0.250		0	10.000_1	63.196	50
PP4	679233.551	757240.648	63.365	0.250		0	11.000	63.115	50
PP5	679243.911	757180.532	60.183	0.250		0	14.000	59.933	50
PP6	679432.534	757184.321	60.164	0.250		0	2.000	59.914	50

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
PP7	679454.378	757126.202	59.565	0.250		 0	3.000	59.315	50
PP8	679386.250	757107.905	58.415	0.250		 0	4.000	58.165	50
PP9	679283.370	757114.056	58.676	0.250		 0	19.000	58.426	100
PP10	679382.451	757140.866	58.872	0.250		 0	6.000_1	58.622	50
37A	679262.726	757110.943	58.280	1.305	1200	 0	17.000	56.975	225
pp11	679277.958	757123.162	58.676	0.250		 0	18.000	58.426	50
pp12	679443.622	757230.268	60.751	0.250		 0	13.000	60.501	100
31B	679324.615	757103.690	57.400	0.899	1200	 1	16.002	56.501	300
32	679359.775	757135.047	59.035	1.425	1200	 0	20.000	57.610	225

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	Scotland and Ireland	Additional Storage (m³/ha)	20.0
M5-60 (mm)	15.800	Starting Level (m)	
Ratio-R	0.296	Check Discharge Rate(s)	x
Summer CV	1.000	Check Discharge Volume	x
Analysis Speed	Normal		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
30	20	0	0
100	20	0	0

Node 22 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.02016	Invert Level (m)	58.523	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.02016	Time to half empty (mins)	15	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	3.000	Number Required	4
Porosity	0.40	Pit Length (m)	62.700		

Node 41 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.04932	Invert Level (m)	54.000	Depth (m)	0.600
Side Inf Coefficient (m/hr)	0.04932	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	3.000	Number Required	6
Porosity	0.40	Pit Length (m)	40.000		

Node PP1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	63.937
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	465.0	0.0	0.250	465.0	0.0	0.251	0.0	0.0

Node PP2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	64.328
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	425.0	0.0	0.250	425.0	0.0	0.251	0.0	0.0

Node PP3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	63.196
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	250.0	0.0	0.250	250.0	0.0	0.251	0.0	0.0

Node PP4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	63.115
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	500.0	0.0	0.250	500.0	0.0	0.251	0.0	0.0

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Node PP5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.933
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	375.0	0.0	0.250	375.0	0.0	0.251	0.0	0.0

Node PP6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.914
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1000.0	0.0	0.250	1000.0	0.0	0.251	0.0	0.0

Node PP7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.315
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	525.0	0.0	0.250	525.0	0.0	0.251	0.0	0.0

Node PP8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.165
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	450.0	0.0	0.250	450.0	0.0	0.251	0.0	0.0

Node PP9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.426
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	575.0	0.0	0.250	575.0	0.0	0.251	0.0	0.0

Node 36 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.02844	Invert Level (m)	55.800	Depth (m)	0.600
Side Inf Coefficient (m/hr)	0.02844	Time to half empty (mins)	316	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	6.950	Number Required	1
Porosity	0.40	Pit Length (m)	40.000		

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Node 39 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.05364	Invert Level (m)	55.163	Depth (m)	0.600
Side Inf Coefficient (m/hr)	0.05364	Time to half empty (mins)	239	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.500	Number Required	1
Porosity	0.40	Pit Length (m)	43.250		

Node PP10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.622
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	575.0	0.0	0.250	575.0	0.0	0.251	0.0	0.0

Node pp11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.426
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	370.0	0.0	0.250	370.0	0.0	0.251	0.0	0.0

Node pp12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	60.501
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	370.0	0.0	0.250	370.0	0.0	0.251	0.0	0.0

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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.73%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1	18	63.179	0.091	13.0	0.1319	0.0000	OK
15 minute summer	2	10	63.127	0.147	29.4	0.2372	0.0000	OK
15 minute summer	3	10	63.272	0.119	29.0	0.2473	0.0000	OK
15 minute summer	5	10	63.573	0.100	34.8	0.2303	0.0000	OK
15 minute summer	6	11	62.964	0.216	97.4	0.2663	0.0000	OK
15 minute summer	7	11	62.385	0.333	102.2	0.4546	0.0000	SURCHARGED
15 minute summer	8	10	62.044	0.104	21.3	0.1877	0.0000	OK
15 minute summer	10	11	61.655	0.170	39.9	0.2967	0.0000	OK
15 minute summer	11	11	61.609	0.402	169.5	0.8953	0.0000	SURCHARGED
15 minute summer	12	11	61.092	0.512	170.3	0.7800	0.0000	SURCHARGED
15 minute summer	13	11	60.600	0.409	187.4	0.6944	0.0000	SURCHARGED
15 minute summer	14	10	62.852	0.046	9.1	0.0660	0.0000	OK
15 minute summer	15	10	60.839	0.078	28.8	0.1395	0.0000	OK
15 minute summer	16	11	59.920	0.594	18.4	0.9519	0.0000	SURCHARGED
30 minute summer	17	19	59.792	0.874	84.3	2.2773	0.0000	SURCHARGED
30 minute summer	18	18	59.482	0.413	17.0	0.5640	0.0000	SURCHARGED
15 minute summer	19	11	59.481	0.768	82.1	2.1033	0.0000	SURCHARGED
15 minute summer	20	10	59.469	0.044	7.9	0.0572	0.0000	OK
30 minute summer	21	19	59.234	0.584	69.1	0.6615	0.0000	SURCHARGED
60 minute summer	22	40	59.143	0.620	379.0	189.4551	0.0000	SURCHARGED
15 minute summer	23	10	59.149	0.105	29.8	0.2238	0.0000	OK
15 minute summer	Dummy	10	58.697	0.136	46.6	0.2178	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1	6.000	2	12.8	0.670	0.350	0.4542	
15 minute summer	2	7.002	6	28.4	0.886	0.775	1.5325	
15 minute summer	3	7.000	6	28.9	1.044	0.560	1.2054	
15 minute summer	5	9.000	6	34.8	1.436	0.414	0.7593	
15 minute summer	6	7.003	7	94.6	2.527	0.906	0.6874	
15 minute summer	7	7.004	11	94.1	2.736	0.901	0.7660	
15 minute summer	8	10.000	10	21.1	0.937	0.445	1.3323	
15 minute summer	10	11.002	11	40.0	1.366	0.644	0.5134	
15 minute summer	11	7.005	12	157.6	2.406	0.800	1.4132	
15 minute summer	12	7.006	13	169.4	2.421	0.961	1.0969	
15 minute summer	13	7.007	22	183.6	2.923	1.033	2.5563	
15 minute summer	14	12.000	15	9.1	1.024	0.092	0.5156	
15 minute summer	15	12.001	17	28.7	0.931	0.260	1.0763	
15 minute summer	16	13.001	17	20.0	0.638	0.548	3.2413	
30 minute summer	17	12.002	22	69.1	1.737	1.887	1.5958	
30 minute summer	18	14.001	19	-10.4	0.434	-0.284	2.8376	
15 minute summer	19	14.002	21	74.2	1.867	2.028	0.4001	
15 minute summer	20	15.000	21	7.9	0.459	0.083	0.5261	
30 minute summer	21	14.003	22	69.4	1.744	1.895	0.4129	
60 minute summer	22	7.008	Dummy Outfall	179.1	2.544	2.287	0.8164	486.5
60 minute summer	22	Infiltration		3.0				
15 minute summer	23	1.000	Dummy	29.8	1.375	0.443	0.6282	
15 minute summer	Dummy	1.001	25	46.5	1.613	0.691	1.6403	

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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.73%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	25	11	57.800	0.181	56.5	0.2445	0.0000	OK
15 minute summer	26	11	57.168	0.358	59.6	0.4659	0.0000	SURCHARGED
15 minute summer	27	10	58.130	0.130	42.9	0.2838	0.0000	OK
15 minute summer	28	10	57.232	0.153	46.8	0.1859	0.0000	OK
15 minute summer	29	10	58.192	0.091	36.7	0.2149	0.0000	OK
15 minute summer	30	11	57.098	0.248	48.6	0.3077	0.0000	SURCHARGED
15 minute summer	31	11	56.834	0.222	64.5	0.3697	0.0000	OK
15 minute summer	33	10	57.354	0.072	20.1	0.1308	0.0000	OK
15 minute summer	34	10	56.713	0.154	29.2	0.2295	0.0000	OK
15 minute summer	35	10	56.588	0.115	41.0	0.1801	0.0000	OK
600 minute summer	36	450	56.230	0.305	8.3	48.2277	0.0000	OK
15 minute summer	37	10	56.229	0.063	16.5	0.1025	0.0000	OK
240 minute summer	38	180	55.473	0.238	8.7	0.4250	0.0000	SURCHARGED
240 minute summer	39	180	55.473	0.310	12.8	29.7353	0.0000	OK
480 minute summer	41	280	56.743	0.102	44.9	173.6369	0.0000	OK
480 minute summer	Dummy Outfall 2	280	56.318	0.100	19.2	0.0000	0.0000	OK
30 minute summer	Dummy Outfall	21	58.748	0.284	173.2	0.0000	0.0000	OK
60 minute summer	PP1	39	64.005	0.068	22.0	13.1233	0.0000	OK
240 minute summer	PP2	168	64.430	0.102	7.5	17.8362	0.0000	FLOOD RISK
120 minute summer	PP3	84	63.327	0.131	12.4	13.7467	0.0000	FLOOD RISK
360 minute summer	PP4	256	63.281	0.166	10.0	34.5579	0.0000	FLOOD RISK
240 minute summer	PP5	160	60.029	0.096	6.5	14.8954	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	25	1.002	26	53.5	1.382	0.942	2.5141	
15 minute summer	26	1.003	41	58.2	1.467	1.591	0.7241	
15 minute summer	27	5.000	28	43.1	1.658	0.641	1.4525	
15 minute summer	28	5.001	41	45.9	1.637	0.772	0.7804	
15 minute summer	29	16.000	30	36.7	1.493	0.348	0.8355	
15 minute summer	30	16.001	31	42.2	1.097	1.153	1.1791	
15 minute summer	31	16.002	31B	64.4	1.222	0.822	1.1635	65.2
15 minute summer	33	21.000	34	20.1	1.022	0.227	0.4993	
15 minute summer	34	21.001	35	29.2	1.181	0.797	0.4215	
15 minute summer	35	21.002	36	40.8	2.047	0.495	0.4373	
600 minute summer	36	Infiltration		1.3				
15 minute summer	37	22.000	38	16.5	0.904	0.173	0.5174	
240 minute summer	38	22.001	39	8.0	0.711	0.218	0.5717	
240 minute summer	39	Infiltration		2.0				
480 minute summer	41	1.004	Dummy Outfall 2	19.2	0.920	0.246	1.7708	74.4
480 minute summer	41	Infiltration		7.1				
60 minute summer	PP1	7.000_1	1	8.5	1.148	0.371	0.0269	
240 minute summer	PP2	8.000	3	1.5	0.750	1.190	0.0149	
120 minute summer	PP3	10.000_1	6	2.5	1.313	1.086	0.0091	
360 minute summer	PP4	11.000	8	1.7	0.887	1.411	0.0122	
240 minute summer	PP5	14.000	18	1.4	0.720	1.179	0.0169	

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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.73%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	PP6	510	60.081	0.167	9.7	69.2664	0.0000	FLOOD RISK
240 minute summer	PP7	168	59.407	0.092	8.1	19.8122	0.0000	FLOOD RISK
240 minute summer	PP8	160	58.250	0.085	6.7	15.6220	0.0000	FLOOD RISK
120 minute summer	PP9	80	58.614	0.187	41.8	46.4188	0.0000	FLOOD RISK
240 minute summer	PP10	160	58.683	0.061	5.9	14.1724	0.0000	FLOOD RISK
15 minute summer	37A	11	57.109	0.134	4.0	0.1514	0.0000	OK
240 minute summer	pp11	160	58.511	0.085	5.8	12.8881	0.0000	FLOOD RISK
60 minute summer	pp12	41	60.607	0.106	27.4	16.4835	0.0000	FLOOD RISK
15 minute summer	31B	11	56.699	0.198	64.4	0.0000	0.0000	OK
15 minute summer	32	1	57.610	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	PP6	2.000	Dummy	1.8	0.925	1.464	0.0105	
240 minute summer	PP7	3.000	25	1.6	0.795	1.263	0.0070	
240 minute summer	PP8	4.000	26	1.5	0.783	1.242	0.0062	
120 minute summer	PP9	19.000	30	10.6	1.356	1.345	0.0352	
240 minute summer	PP10	6.000_1	28	1.3	0.701	1.091	0.0091	
15 minute summer	37A	17.000	30	-4.0	-0.210	-0.110	0.8017	
240 minute summer	pp11	18.000	30	1.4	0.713	1.123	0.0207	
60 minute summer	pp12	13.000	16	8.3	1.139	1.013	0.0401	
15 minute summer	32	20.000	31	0.0	0.000	0.000	0.5842	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	12	63.621	0.533	22.5	0.7725	0.0000	SURCHARGED
15 minute summer	2	12	63.596	0.616	36.3	0.9949	0.0000	SURCHARGED
15 minute summer	3	11	63.531	0.378	37.7	0.7843	0.0000	SURCHARGED
15 minute summer	5	10	63.596	0.123	45.1	0.2817	0.0000	OK
15 minute summer	6	12	63.417	0.669	118.0	0.8231	0.0000	SURCHARGED
15 minute summer	7	11	62.773	0.721	97.8	0.9843	0.0000	SURCHARGED
15 minute summer	8	12	62.113	0.173	27.2	0.3109	0.0000	OK
15 minute summer	10	11	62.070	0.585	51.2	1.0212	0.0000	SURCHARGED
15 minute summer	11	11	61.984	0.777	172.8	1.7303	0.0000	SURCHARGED
15 minute summer	12	11	61.380	0.800	178.7	1.2195	0.0000	SURCHARGED
15 minute summer	13	11	60.796	0.605	197.8	1.0265	0.0000	SURCHARGED
15 minute summer	14	10	62.858	0.052	11.8	0.0751	0.0000	OK
15 minute summer	15	10	60.851	0.090	37.3	0.1604	0.0000	OK
30 minute summer	16	19	60.559	1.233	24.1	1.9752	0.0000	FLOOD RISK
30 minute summer	17	19	60.458	1.540	109.1	4.0145	0.0000	FLOOD RISK
15 minute summer	18	11	60.010	0.940	29.9	1.2846	0.0000	FLOOD RISK
15 minute summer	19	11	59.925	1.213	115.9	3.3211	0.0000	SURCHARGED
30 minute summer	20	19	59.520	0.094	9.3	0.1235	0.0000	OK
30 minute summer	21	19	59.509	0.859	96.0	0.9733	0.0000	SURCHARGED
60 minute summer	22	40	59.344	0.821	498.5	250.6761	0.0000	SURCHARGED
15 minute summer	23	10	59.168	0.124	38.6	0.2632	0.0000	OK
15 minute summer	Dummy	11	58.749	0.188	60.3	0.3007	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	6.000	2	19.4	0.683	0.530	0.8616	
15 minute summer	2	7.002	6	34.3	1.028	0.938	1.8427	
15 minute summer	3	7.000	6	35.5	1.050	0.688	1.6309	
15 minute summer	5	9.000	6	43.9	1.499	0.522	0.8626	
15 minute summer	6	7.003	7	90.1	2.482	0.862	0.6919	
15 minute summer	7	7.004	11	96.9	2.679	0.928	0.7660	
15 minute summer	8	10.000	10	26.8	0.953	0.566	1.9775	
15 minute summer	10	11.002	11	43.5	1.332	0.700	0.5678	
15 minute summer	11	7.005	12	165.2	2.379	0.838	1.4132	
15 minute summer	12	7.006	13	178.5	2.535	1.013	1.0969	
15 minute summer	13	7.007	22	197.9	2.872	1.113	2.5563	
15 minute summer	14	12.000	15	11.8	1.100	0.119	0.6217	
15 minute summer	15	12.001	17	37.2	1.164	0.338	1.1286	
30 minute summer	16	13.001	17	21.0	0.724	0.573	3.2413	
30 minute summer	17	12.002	22	90.1	2.265	2.461	1.5958	
15 minute summer	18	14.001	19	-21.3	-0.555	-0.581	2.8376	
15 minute summer	19	14.002	21	93.6	2.353	2.556	0.4001	
30 minute summer	20	15.000	21	9.2	0.419	0.097	0.6465	
30 minute summer	21	14.003	22	92.3	2.322	2.522	0.4129	
60 minute summer	22	7.008	Dummy Outfall	219.8	3.122	2.807	0.8164	636.9
60 minute summer	22	Infiltration		3.3				
15 minute summer	23	1.000	Dummy	38.7	1.436	0.575	0.7961	
15 minute summer	Dummy	1.001	25	56.6	1.671	0.841	2.1261	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	25	11	58.270	0.651	69.7	0.8809	0.0000	SURCHARGED
15 minute summer	26	11	57.265	0.455	66.9	0.5928	0.0000	SURCHARGED
15 minute summer	27	10	58.156	0.156	55.5	0.3401	0.0000	OK
15 minute summer	28	10	57.270	0.191	60.6	0.2321	0.0000	OK
15 minute summer	29	10	58.206	0.105	47.5	0.2483	0.0000	OK
15 minute summer	30	11	57.297	0.447	61.9	0.5546	0.0000	SURCHARGED
15 minute summer	31	11	56.893	0.281	82.8	0.4673	0.0000	OK
15 minute summer	33	10	57.365	0.083	26.0	0.1497	0.0000	OK
15 minute summer	34	10	56.744	0.185	37.8	0.2768	0.0000	OK
15 minute summer	35	10	56.608	0.135	53.0	0.2122	0.0000	OK
600 minute summer	36	495	56.378	0.453	10.4	64.8839	0.0000	OK
15 minute summer	37	10	56.238	0.072	21.3	0.1169	0.0000	OK
240 minute summer	38	192	55.590	0.355	11.1	0.6345	0.0000	SURCHARGED
240 minute summer	39	192	55.590	0.427	16.4	40.9955	0.0000	OK
180 minute summer	41	104	56.839	0.198	106.4	174.2807	0.0000	OK
180 minute summer	Dummy Outfall 2	104	56.407	0.189	58.7	0.0000	0.0000	OK
15 minute summer	Dummy Outfall	13	58.748	0.284	188.1	0.0000	0.0000	OK
60 minute summer	PP1	39	64.021	0.084	28.6	16.2356	0.0000	OK
240 minute summer	PP2	172	64.463	0.135	9.6	23.7203	0.0000	FLOOD RISK
120 minute summer	PP3	88	63.375	0.179	16.1	18.8275	0.0000	FLOOD RISK
360 minute summer	PP4	264	63.334	0.219	12.7	45.7627	0.0000	FLOOD RISK
240 minute summer	PP5	168	60.062	0.129	8.4	19.9100	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	25	1.002	26	59.8	1.504	1.054	2.7040	
15 minute summer	26	1.003	41	66.3	1.669	1.812	0.7345	
15 minute summer	27	5.000	28	55.8	1.735	0.830	1.8058	
15 minute summer	28	5.001	41	58.5	1.697	0.984	1.0148	
15 minute summer	29	16.000	30	47.5	1.563	0.451	0.8902	
15 minute summer	30	16.001	31	54.6	1.374	1.492	1.2684	
15 minute summer	31	16.002	31B	82.5	1.304	1.054	1.3825	85.4
15 minute summer	33	21.000	34	26.0	1.076	0.293	0.6039	
15 minute summer	34	21.001	35	37.7	1.246	1.031	0.5129	
15 minute summer	35	21.002	36	52.9	2.171	0.641	0.5337	
600 minute summer	36	Infiltration		1.3				
15 minute summer	37	22.000	38	21.3	0.976	0.223	0.6125	
240 minute summer	38	22.001	39	10.2	0.782	0.279	0.5717	
240 minute summer	39	Infiltration		2.1				
180 minute summer	41	1.004	Dummy Outfall 2	58.7	1.224	0.750	4.0646	96.3
180 minute summer	41	Infiltration		7.1				
60 minute summer	PP1	7.000_1	1	12.1	1.248	0.525	0.0351	
240 minute summer	PP2	8.000	3	1.6	0.799	1.268	0.0150	
120 minute summer	PP3	10.000_1	6	2.7	1.376	1.158	0.0091	
360 minute summer	PP4	11.000	8	1.9	0.987	1.569	0.0122	
240 minute summer	PP5	14.000	18	1.5	0.765	1.254	0.0170	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	PP6	525	60.132	0.218	12.2	90.1761	0.0000	FLOOD RISK
360 minute summer	PP7	248	59.436	0.121	8.0	26.0818	0.0000	FLOOD RISK
240 minute summer	PP8	164	58.277	0.112	8.6	20.5791	0.0000	FLOOD RISK
120 minute summer	PP9	82	58.674	0.248	53.9	61.4242	0.0000	FLOOD RISK
360 minute summer	PP10	240	58.702	0.080	5.8	18.6512	0.0000	FLOOD RISK
15 minute summer	37A	11	57.294	0.319	7.1	0.3612	0.0000	SURCHARGED
240 minute summer	pp11	164	58.540	0.114	7.5	17.2989	0.0000	FLOOD RISK
60 minute summer	pp12	42	60.643	0.141	35.6	22.0414	0.0000	FLOOD RISK
15 minute summer	31B	11	56.725	0.224	82.5	0.0000	0.0000	OK
15 minute summer	32	1	57.610	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	PP6	2.000	Dummy	2.0	1.029	1.629	0.0105	
360 minute summer	PP7	3.000	25	1.7	0.890	1.414	0.0070	
240 minute summer	PP8	4.000	26	1.7	0.879	1.394	0.0063	
120 minute summer	PP9	19.000	30	12.4	1.579	1.566	0.0352	
360 minute summer	PP10	6.000_1	28	1.4	0.736	1.174	0.0092	
15 minute summer	37A	17.000	30	-7.1	-0.228	-0.195	0.9904	
240 minute summer	pp11	18.000	30	1.5	0.743	1.178	0.0208	
60 minute summer	pp12	13.000	16	9.1	1.169	1.122	0.0405	
15 minute summer	32	20.000	31	0.0	0.000	0.000	0.8092	

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C. Soakaway Calculation

Column1	Column2	Column3
Impermeable Area	19437.23	m2
Contributing Area	10533.76	m2

Soakaway	Column1	Column2	Column3	Column4
l	w	h	No.	Void Ratio
62.95	3	1.2	4	0.6

Stone 1	0.4
Stone 2	0.6
Stormcell	0.95

MINS	Rainfall (m)	Inflow (m3)		f (m/s)	Duration	Outflow	S required	S provided	Pass/Fail
15	**0.0100**	105.3376	79.14	0.0000071	900	0.5057046	104.8318954	543.888	Pass
30	**0.0126**	132.725376	79.14	0.0000071	1800	1.0114092	131.7139668	543.888	Pass
60	**0.0158**	166.433408	79.14	0.0000071	3600	2.0228184	164.4105896	543.888	Pass
120	**0.0198**	208.568448	79.14	0.0000071	7200	4.0456368	204.5228112	543.888	Pass
240	**0.0249**	262.290624	79.14	0.0000071	14400	8.0912736	254.1993504	543.888	Pass
360	**0.0285**	300.21216	79.14	0.0000071	21600	12.1369104	288.0752496	543.888	Pass
720	**0.0358**	377.108608	79.14	0.0000071	43200	24.2738208	352.8347872	543.888	Pass
1440	**0.0451**	475.072576	79.14	0.0000071	86400	48.5476416	426.5249344	543.888	Pass
2880	**0.0533**	561.449408	79.14	0.0000071	172800	97.0952832	464.3541248	543.888	Pass
4320	**0.0604**	636.239104	79.14	0.0000071	259200	145.642925	490.5961792	543.888	Pass
5760	**0.0668**	703.655168	79.14	0.0000071	345600	194.190566	509.4646016	543.888	Pass
8640	**0.0782**	823.740032	79.14	0.0000071	518400	291.28585	532.4541824	543.888	Pass
11520	**0.0885**	932.23776	79.14	0.0000071	691200	388.381133	543.8566272	543.888	Pass

SOAKAWAY 1

Column1	Column2	Column3
Impermeable Area	10834.53	m2
Contributing Area	5242.81	m2

Soakaway	Column1	Column2	Column3	Column4
l	w	h	No.	Void Ratio
40	3	0.6	6	0.6

Stone 1	0.4
Stone 2	0.6
Stormcell	0.95

MINS	Rainfall (m)	Inflow (m3)		f (m/s)	Duration	Outflow	S required	S provided	Pass/Fail
15	**0.0100**	52.4281	25.8	0.0000137	900	0.318114	52.109986	259.2	Pass
30	**0.0126**	66.059406	25.8	0.0000137	1800	0.636228	65.423178	259.2	Pass
60	**0.0158**	82.836398	25.8	0.0000137	3600	1.272456	81.563942	259.2	Pass
120	**0.0198**	103.807638	25.8	0.0000137	7200	2.544912	101.262726	259.2	Pass
240	**0.0249**	130.545969	25.8	0.0000137	14400	5.089824	125.456145	259.2	Pass
360	**0.0285**	149.420085	25.8	0.0000137	21600	7.634736	141.785349	259.2	Pass
720	**0.0358**	187.692598	25.8	0.0000137	43200	15.269472	172.423126	259.2	Pass
1440	**0.0451**	236.450731	25.8	0.0000137	86400	30.538944	205.911787	259.2	Pass
2880	**0.0533**	279.441773	25.8	0.0000137	172800	61.077888	218.363885	259.2	Pass
4320	**0.0604**	316.665724	25.8	0.0000137	259200	91.616832	225.048892	259.2	Pass
5760	**0.0668**	350.219708	25.8	0.0000137	345600	122.155776	228.063932	259.2	Pass
8640	**0.0782**	409.987742	25.8	0.0000137	518400	183.233664	226.754078	259.2	Pass
11520	**0.0885**	463.988685	25.8	0.0000137	691200	244.311552	219.677133	259.2	Pass
					0				
					0				

SOAKAWAY 2

Column1	Column2	Column3
Impermeable Area	2193.92	m2
Contributing Area	2193.92	m2

Soakaway	Column1	Column2	Column3	Column4
l	w	h	No.	Void Ratio
40	6.95	0.6	1	0.6

Stone 1	0.4
Stone 2	0.6
Stormcell	0.95

MINS	Rainfall (m)	Inflow (m3)		f (m/s)	Duration	Outflow	S required	S provided	Pass/Fail
15	**0.0100**	21.9392	28.17	0.0000079	900	0.2002887	21.7389113	100.08	Pass
30	**0.0126**	27.643392	28.17	0.0000079	1800	0.4005774	27.2428146	100.08	Pass
60	**0.0158**	34.663936	28.17	0.0000079	3600	0.8011548	33.8627812	100.08	Pass
120	**0.0198**	43.439616	28.17	0.0000079	7200	1.6023096	41.8373064	100.08	Pass
240	**0.0249**	54.628608	28.17	0.0000079	14400	3.2046192	51.4239888	100.08	Pass
360	**0.0285**	62.52672	28.17	0.0000079	21600	4.8069288	57.7197912	100.08	Pass
720	**0.0358**	78.542336	28.17	0.0000079	43200	9.6138576	68.9284784	100.08	Pass
1440	**0.0451**	98.945792	28.17	0.0000079	86400	19.2277152	79.7180768	100.08	Pass
2880	**0.0533**	116.935936	28.17	0.0000079	172800	38.4554304	78.4805056	100.08	Pass
4320	**0.0604**	132.512768	28.17	0.0000079	259200	57.6831456	74.8296224	100.08	Pass
5760	**0.0668**	146.553856	28.17	0.0000079	345600	76.9108608	69.6429952	100.08	Pass
8640	**0.0782**	171.564544	28.17	0.0000079	518400	115.366291	56.1982528	100.08	Pass
11520	**0.0885**	194.16192	28.17	0.0000079	691200	153.821722	40.3401984	100.08	Pass

SOAKAWAY 3

Column1	Column2	Column3
Impermeable Area	2277.11	m2
Contributing Area	2277.11	m2

Soakaway	Column1	Column2	Column3	Column4
l	w	h	No.	Void Ratio
43.25	5.5	0.6	1	0.6

Stone 1	0.4
Stone 2	0.6
Stormcell	0.95

MINS	Rainfall (m)	Inflow (m3)		f (m/s)	Duration	Outflow	S required	S provided	Pass/Fail
15	**0.0100**	22.7711	29.25	0.0000149	900	0.3922425	22.3788575	85.635	Pass
30	**0.0126**	28.691586	29.25	0.0000149	1800	0.784485	27.907101	85.635	Pass
60	**0.0158**	35.978338	29.25	0.0000149	3600	1.56897	34.409368	85.635	Pass
120	**0.0198**	45.086778	29.25	0.0000149	7200	3.13794	41.948838	85.635	Pass
240	**0.0249**	56.700039	29.25	0.0000149	14400	6.27588	50.424159	85.635	Pass
360	**0.0285**	64.897635	29.25	0.0000149	21600	9.41382	55.483815	85.635	Pass
720	**0.0358**	81.520538	29.25	0.0000149	43200	18.82764	62.692898	85.635	Pass
1440	**0.0451**	102.697661	29.25	0.0000149	86400	37.65528	65.042381	85.635	Pass
2880	**0.0533**	121.369963	29.25	0.0000149	172800	75.31056	46.059403	85.635	Pass
4320	**0.0604**	137.537444	29.25	0.0000149	259200	112.96584	24.571604	85.635	Pass
5760	**0.0668**	152.110948	29.25	0.0000149	345600	150.62112	1.489828	85.635	Pass
8640	**0.0782**	178.070002	29.25	0.0000149	518400	225.93168	-47.861678	85.635	Pass
11520	**0.0885**	201.524235	29.25	0.0000149	691200	301.24224	-99.718005	85.635	Pass

SOAKAWAY 4

D. Soakaway Test Report

Soakaway Hole No.1 ITM Coordinates

Easting	Northing
679324	757335

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1	0.6	0.5	0.375	0.125	0.15	1.4	3960	0.0271	0.0974

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1	0.6	0.5	0.375	0.125	0.15	1.4	6720	0.0159	0.0574

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1	0.6	0.5	0.375	0.125	0.15	1.4	9,960	0.0108	0.039
						Average:	6,880	0.0179	0.0645
						BRE Digest Value		**0.0108**	**0.039**

Soakaway Hole No.2 ITM Coordinates

Easting	Northing
679331	757289

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. udes area of b	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.5	0.375	0.125	0.2975	2.39	12720	0.0098	0.0352

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

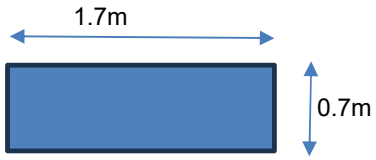
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted face to 50% de sq.m. udes area of b	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.5	0.375	0.125	0.2975	2.39	21240	0.0059	0.0211

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted face to 50% de sq.m. udes area of b	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.5	0.375	0.125	0.2975	2.39	28,800	0.0043	0.0156
						Average:	20,920	0.0067	0.0240
						BRE Digest Value		0.043	0.0156



Soakaway Hole No.3 ITM Coordinates

Easting	Northing
679244	757263

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	3240	0.0419	0.1508

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	11580	0.0117	0.0422

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	14,780	0.0092	0.0331
						Averagre:	9,867	0.0209	0.0754

BRE Digest Value	0.092	0.0331

Soakaway Hole No.4 ITM Coordinates

Easting	Northing
679245	757203

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.6	0.5	0.375	0.125	0.225	1.95	3120	0.0370	0.1331

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.6	0.5	0.375	0.125	0.225	1.95	5760	0.0200	0.0721

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.6	0.5	0.375	0.125	0.225	1.95	9,060	0.0127	0.0458

Averagre:	5,980	0.0232	0.0837
BRE Digest Value		**0.0127**	**0.0458**

Soakaway Hole No.5 ITM Coordinates

Easting	Northing
679309	757224

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.75	0.4	0.3	0.1	0.225	2.025	9275	0.0120	0.0431

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

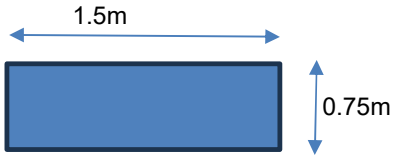
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.75	0.4	0.3	0.1	0.225	2.025	13660	0.0081	0.0293

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.75	0.4	0.3	0.1	0.225	2.025	20,980	0.0053	0.0191
						Average:	14,638	0.0085	0.0305
						BRE Digest Value		**0.0053**	**0.0191**



Soakaway Hole No.6 ITM Coordinates

Easting	Northing
679407	757254

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.7	0.5	0.375	0.125	0.2625	2.15	6900	0.0177	0.0637

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

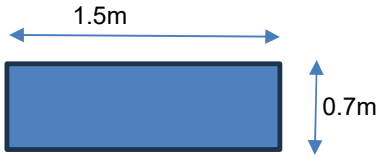
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.7	0.5	0.375	0.125	0.2625	2.15	16360	0.0075	0.0269

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.7	0.5	0.375	0.125	0.2625	2.15	19,620	0.0062	0.0224
						Averagre:	14,293	0.0105	0.0377



BRE Digest Value	**0.0062**	**0.0224**

Soakaway Hole No.7 ITM Coordinates

Easting	Northing
679357	757213

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.6	0.7	0.6	0.45	0.15	0.336	2.5	9480	0.0142	0.0510

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

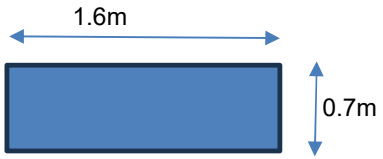
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.6	0.7	0.6	0.45	0.15	0.336	2.5	12240	0.0110	0.0395

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.6	0.7	0.6	0.45	0.15	0.336	2.5	15,240	0.0088	0.0317
						Averagre:	12,320	0.0113	0.0408
						BRE Digest Value		**0.0088**	**0.0317**



Soakaway Hole No.8 ITM Coordinates

Easting	Northing
679335	757195

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	14160	0.0096	0.0345

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Second Fill

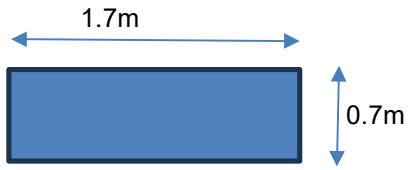
Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	19260	0.0070	0.0254

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	24,360	0.0056	0.0201

Average:	19,260	0.0074	0.0266
BRE Digest Value		**0.0056**	**0.0201**



Soakaway Hole No.9 ITM Coordinates

Easting	Northing
679295	757149

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	2880	0.0471	0.1697

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

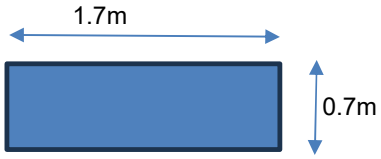
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	5340	0.0254	0.0915

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.6	0.45	0.15	0.357	2.63	7,740	0.0175	0.0631
						Average:	5,320	0.0300	0.1081



BRE Digest Value	**0.0175**	**0.0631**

Soakaway Hole No.10 ITM Coordinates

Easting	Northing
679406	757166

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.7	0.6	0.45	0.15	0.315	2.37	7320	0.0182	0.0654

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

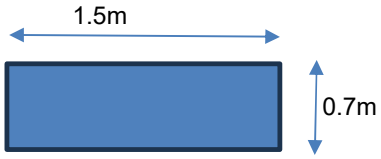
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.7	0.6	0.45	0.15	0.315	2.37	13980	0.0095	0.0342

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.7	0.6	0.45	0.15	0.315	2.37	17,280	0.0077	0.0277
						Average:	12,860	0.0118	0.0424
						BRE Digest Value		**0.0077**	**0.0277**



Soakaway Hole No.11 ITM Coordinates

Easting	Northing
679374	757145

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.7	0.6	0.45	0.15	0.378	2.76	8700	0.0157	0.0567

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

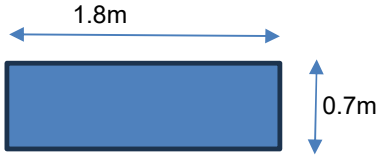
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.7	0.6	0.45	0.15	0.378	2.76	12960	0.0106	0.0380

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.7	0.6	0.45	0.15	0.378	2.76	17,520	0.0078	0.0281
						Average:	13,060	0.0114	0.0410
						BRE Digest Value		**0.0078**	**0.0281**



Soakaway Hole No.12 ITM Coordinates

Easting	Northing
679347	757140

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.9	0.6	0.45	0.15	0.486	3.24	7260	0.0207	0.0744

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

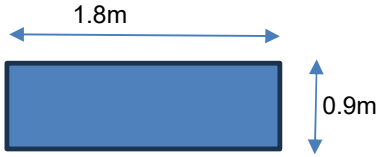
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.9	0.6	0.45	0.15	0.486	3.24	17280	0.0087	0.0313

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.9	0.6	0.45	0.15	0.486	3.24	24,600	0.0061	0.0220
						Average:	16,380	0.0118	0.0425
						BRE Digest Value		**0.0061**	**0.022**



Soakaway Hole No.13 ITM Coordinates

Easting	Northing
679366	757120

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.8	0.5	0.375	0.125	0.3	2.35	2040	0.0626	0.2253

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

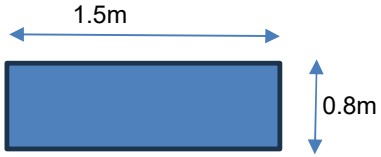
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.8	0.5	0.375	0.125	0.3	2.35	3,660	0.0349	0.1256

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.8	0.5	0.375	0.125	0.3	2.35	5,220	0.0245	0.0880
						Average:	3,640	0.041	0.146
						BRE Digest Value		**0.0245**	**0.088**



Soakaway Hole No.14 ITM Coordinates

Easting	Northing
679383	757076

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.8	0.6	0.45	0.15	0.36	2.58	4380	0.0319	0.1147

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

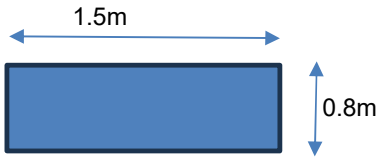
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.8	0.6	0.45	0.15	0.36	2.58	7620	0.0183	0.0659

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.5	0.8	0.6	0.45	0.15	0.36	2.58	11,160	0.0125	0.0450
						Averagre:	7,720	0.0209	0.0752
						BRE Digest Value		**0.0125**	**0.045**



Soakaway Hole No.15 ITM Coordinates

Easting	Northing
679334	757065

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.5	0.375	0.125	0.2975	2.39	2760	0.0451	0.1624

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

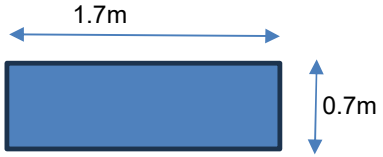
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.5	0.375	0.125	0.2975	2.39	5040	0.0247	0.0889

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.7	0.7	0.5	0.375	0.125	0.2975	2.39	8,340	0.0149	0.0537
						Average:	5,380	0.028	0.102



BRE Digest Value	**0.0125**	**0.045**

Soakaway Hole No.16 ITM Coordinates

Easting	Northing
679445	757082

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit First Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.7	0.5	0.375	0.125	0.315	2.51	4260	0.0295	0.1061

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

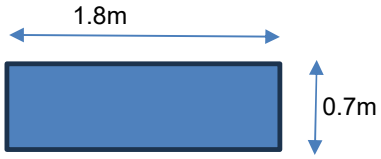
Trial Pit Second Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.7	0.5	0.375	0.125	0.315	2.51	10200	0.0123	0.0443

CALCULATION OF SOAKAWAY PIT BASED ON BRE DIGEST 365

Trial Pit Third Fill

Length of trial pit m.	Width of trial pit m.	Effective depth of pit m.	75% of Eff. depth of pit m.	25% of Eff. depth of pit m.	Vol. between 75% and 25% cu.m	Area of Wetted surface to 50% depth sq.m. (includes area of base)	Time of drop from 75% to 25% full secs	Soil Infiltration Rate 'f' mm/sec	Infiltration Rate 'f' m./hr
1.8	0.7	0.5	0.375	0.125	0.315	2.51	15,960	0.0079	0.0283
						Averagre:	10,140	0.0165	0.0596
						BRE Digest Value		**0.0079**	**0.0283**



E. CDS22008568 Confirmation of feasibility

CONFIRMATION OF FEASIBILITY

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

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

www.water.ie

Paul Bergin

Kilgallen & Partners
Kylekiproe
Well Road
Portlaoise
Laois
R32P668

14 March 2023

Our Ref: CDS22008568 Pre-Connection Enquiry
Kildalkey Road, Trim, Co. Meath

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 Multi/Mixed Use Development of 206 unit(s) at Kildalkey Road, Trim, Co. Meath, (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 connection at the development, upgrades are required on the Irish Water network. Approximately 800m of existing 150mm and 100mm main is to be replaced with new 225 ID watermain up to the existing 400mm UPVC main on Haggard Street to the East of the site (Red line in mapping below). All existing connections to the main(s) are to be connected to this new section of watermain. These upgrades are not on the current Irish Water investment plan therefore, the applicant will be required to fund these upgrades. The fee will be calculated at Connection Application Stage.
- A 125mm ID connection (Orange line in mapping below) is to be made to this newly upsized section of watermain.
- A bulk meter is to be installed on the connection main and linked up with telemetry.

Stiúrthóirí / Directors: Tony Keohane (Chairman), Niall Gleeson (CEO), Christopher Banks, Fred Barry, Gerard Britchfield, Liz Joyce, Patricia King, Eileen Maher, Cathy Mannion, 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 1 D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363
IW-HP-MD
REV013

Figure 1 Water upgrades required

- **Wastewater Connection** - Feasible Subject to upgrades

- Approximately 70m of network extension will be required to connect to the proposed connection point in Elder Grove as per the applicant submitted proposals. These works are not on the current Irish Water investment plan therefore, the applicant will be required to fund these upgrades. The fee will be calculated at Connection Application Stage.
- Upgrades are required to facilitate a connection for this development. There are known constraints in the downstream wastewater network due to storm connections being present on the wastewater network. The applicant is required to identify areas in conjunction with the Local Authority, where hardstanding is draining to the wastewater network and carry out works to remove these flows, diverting them to surface water bodies or dedicated storm sewers which are not connected to any Irish Water wastewater / combined sewers. Irish Water will consider a new connection offset by storm separation works to remove storm runoff with a peak flow the equivalent of a 1 in 1 year storm event equalling no less than 3 times the peak dry weather flow for the new development for wastewater discharge. If you wish to discuss this further, pleas feel free to contact Irish Water.
- Separate storm and foul water connection services have to be provided for the Development. The surface and storm water from the site must be discharged only into an existing storm water network that does not discharge to an IW combined/foul sewer. The connection arrangement should be agreed with the Local Authority Drainage Division.
- The proposed pumping station and associated rising main is to be designed in accordance with the Irish Water Codes of Practice and Standard Details.

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/

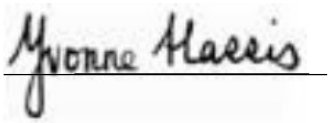
Where can you find more information?

- **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,



Yvonne Harris
Head of Customer Operations

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 Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
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?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *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 Irish Water's network(s)?	• Requests for maps showing Irish Water'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 ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** 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 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.

F. OPW consent letter

OPW Oifig na nOibreacha Poiblí Office of Public Works

8th April 2026.

RE: Horizontal directional drilling for a new Sewer line under the main Boyne river in Trim, Co. Meath by Loughglynn developments.

To Whom it may concern:

This office looks after the maintenance of the Boyne Arterial drainage scheme which includes the main channel C1 under which the proposed pipeline is being constructed. This office has no objection to the proposed Horizontal directional drilling for the new sewer line under the Boyne at Trim Co. Meath relating to the new housing development by Loughglynn developments ltd on the Kildalkey road, Trim, Co. Meath.

The sewer line should be 3m below the river bed as shown on the drawings submitted and a marker should be placed on each bank of the river to indicate the line of the sewer under the river bed.

Yours sincerely,

Jamie Keogh
Grade 2 Engineer

Newtown,

Trim,

Ceann Oifig, Sráid Jonathan Swift, Baile Átha Troim, Co. na Mí, C15 NX36
Head Office, Jonathan Swift Street, Trim, Co. Meath, C15 NX36
T +353 46 942 6000 | info@opw.ie
www.opw.ie

G. Trim Pitch and Putt Club consent agreement

Trim Pitch and Putt Club

Jonathan Swift Street, Trim, Co. Meath C15 R293

Pitch and Putt Ireland

To:
Planning Department,
Meath County Council,
Buvinda House,
Dublin Road,
Navan,
Co. Meath.

Re/ Planning application being submitted by Loughglynn Developments Limited for a proposed Large Residential Development (LRD) on site to the South of the Kildalkey Road, Trim, County Meath.

Dear Sir / Madam,

On behalf of Trim Pitch and Putt Club, I, the undersigned hereby give consent to Loughglynn Developments to include part of our property at "Commons 1st Division" townland, Trim within the red line boundary of the overall application site to facilitate the installation of an underground foul sewer line by way of Horizontal Directional Drilling (HDD) between points "A" and "B" on the attached map. The Trim Pitch and Putt Club property is shown coloured green on the attached map, representing the extent of Folio MH32898F. In the event that planning permission is secured for the proposed development, this consent includes a commitment to putting the necessary legal agreement and wayleave in place.

Signed: _____

Mark Gibney, Chairperson
Trim Pitch & Putt Club

Date: 21/10/2025

679827.2166 mE, 757472.7197 mN

679184.5911 mE, 756647.7839 mN

County: Meath

OS REF: Meath 2710

SITE LOCATION MAP

Created

Date: 19th September 2025

1:2,500 (A3)

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H. Petrifying Tufa Springs Walk-Over Survey prepared by Dr. Joanne Denyer

To: Aidan Hora (Loughglynn Developments Limited)
From: Dr Joanne Denyer (Denyer Ecology)
Date: 27 February 2025
Subject: Kildalkey Road, Trim, Petrifying spring walk-over survey 2025

Survey summary

This site was visited on 25 February 2025 to assess whether there were any examples of the Annex I priority habitat 'Petrifying springs with tufa formation' [*7220] present. The project site and an adjacent area of riverbank to the east were walked over and the presence of *7220 recorded where encountered. Detailed plots were not undertaken at this stage, as it is outside of the main survey season for petrifying springs. Part of the site is located within the River Boyne and River Blackwater SAC [002299].

Tufa formation was found in a number of locations in streams/ springs in the lower part of the site, within the SAC (Figure 1). There is a spring in the west of the site (Photograph 1), which is marked on historic mapping. This has a springhead area with tufa present in an adjacent area of wet grassland/ spring vegetation (Photograph 2). This vegetation has affinity to alkaline fen, which is a Qualifying Interest of the River Boyne and River Blackwater, but it was not the correct time of year for assessment of this habitat. A channel flows south to the river with tufa frequent throughout the length (Photograph 3). The tufa is present as lumps of cascade tufa, oncoids and ooids (coated particles) and some paludal tufa on growing plants. There were no positive indicator species for the Annex I priority habitat 'Petrifying springs with tufa formation' [*7220] recorded. **The spring is considered an example of Annex I priority habitat 'Petrifying springs with tufa formation'**, in unfavourable condition. The lack of positive indicator species is likely to be due to nutrient enrichment in the catchment area (e.g. probable past use of nitrates/ phosphates on the agricultural land to the north, past shading by tall vegetation and scrub and recent damage by scrub clearance and machinery use in the area (Photograph 4). The pH of the water at the presumed springhead was 7.02, but this increased to 7.48 in the southern part of the spring. Electrical conductivity was 804 µS cm-1.

To the east there is an area where there are several springs and stream channels which join each other, with tufa formation present intermittently throughout the area. The central area has been recently disturbed by machinery and scrub clearance (Photograph 5), but the eastern area has some springs still within scrub and immature wet woodland on the riverbank (Photograph 6). The tufa is present as oncoids and ooid particles in the streams (Photograph 7) and occasional areas with cascade tufa (Photographs 8-10). The disturbance of the springs and adjacent vegetation (Photographs 11-13) means that it is not possible to be clear where the original springhead and springlines would have been. Only one positive indicator species for *7220 was recorded (*Didymodon tophaceus*) (Photograph 10). This was in the eastern part of the site that had not been recently disturbed and still had wet willow scrub present. The low cover of positive indicators is likely due to past and recent impacts at the site, and so the **springs in this area** are examples of the **Annex I priority habitat 'Petrifying springs with tufa formation**', in unfavourable condition. The pH of the water at one location in the eastern disturbed area was 7.29 and electrical conductivity was 802 µS cm-1.

Ecological sensitivities

Petrifying springs can be damaged by direct habitat loss and changes to water quality (e.g. pH, mineral composition and nutrient levels) and quantity (e.g. flow rate). Changes to water quantity can result from loss of recharge area above the petrifying spring/ seepage areas (e.g. from hardstanding and changes in groundwater flow and direction resulting from landscaping and excavation) and water quality from surface water flows into the springs and/ or other nutrient rich water. Input from an experienced petrifying spring hydrogeologist, in consultation with a petrifying spring ecologist, is required to avoid impacts from any proposed development on the petrifying springs/ seepage areas.

Actions:

- The spring/ seepages should be **protected** from any **direct disturbance**. There should be no further machinery works in the petrifying spring/ seepage zones within the SAC as shown on Figure 1.
- There should be **no development works in the spring/ seepage areas**. This includes landscaping works and planting.
- The area of spring/ seepages should be **protected from recreational disturbance**/ pressure resulting from any proposed development.
- **Detailed botanical survey and condition assessment** of petrifying springs/ seepages and any potential alkaline fen, in the survey season (May to September). This will allow an assessment of their condition and conservation ranking, and act as a baseline for any future monitoring works. This should be accompanied by water chemistry sampling.
- An **experienced petrifying spring hydrogeologist** is required to investigate whether the proposed development to the north of the spring/ seepages could **impact the recharge zone** of the spring/ seepages. Any interception could reduce the water flow to the spring/ seepage area.
- The **drainage scheme** for the proposed development to the north of the north of the spring/ seepages will need to be **reviewed by an experienced petrifying spring hydrogeologist** to ensure there are no potential negative impacts on the spring/ seepage water quality and quantity. Surface water should not be discharged directly into this area as it would dilute the groundwater and may reduce tufa formation. Any SuDS on site must ensure that water goes through an appropriate soil zone before discharging to the spring/ seepage area, to ensure it has the correct water chemistry.
- As part of any proposed development, a **restoration plan** should be prepared by an experienced petrifying spring hydrogeologist and petrifying spring ecologist for the petrifying spring/ seepage area. With appropriate management the petrifying spring vegetation will recover from the disturbance and could be managed to improve the habitat condition.

Relevant expertise

Dr Joanne Denyer is a highly experienced botanist and bryologist with over 25 years' experience of ecological survey and research. She specialises in botanical, wetland and bryological survey in the Republic of Ireland. She is a national expert on Annex I priority habitat petrifying springs and has worked on a wide range of projects and sites in relation to this habitat. This includes detailed site survey, assessment and monitoring, habitat management, Ecological Impact Assessment, pre and post construction monitoring, acting as an expert witness on calcareous springs at Oral Hearing and providing advice to county councils and NPWS. In 2018 (Denyer et al, 2018) and 2024 she assisted National Parks and Wildlife Service (NPWS) in Article 17 reporting on Petrifying springs to the European Commission. The 2024 assessment included a national survey of petrifying spring sites

across Ireland. She is the lead author of new guidance on petrifying spring assessment and monitoring[1].

Figure 1. Location of petrifying spring/ seepage areas within the survey area

RGB Aerial Photography - © Bluesky Geospatial Limited

Photograph 1. Spring in west of site (view to north)

[1]Denyer, J., Eakin, M., & Gill, M. (2023). Guidelines for the Assessment of Annex I Priority Petrifying Springs in Ireland. *Irish Wildlife Manuals*, No. 142. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

Photograph 2. Tufa formation in fen/ spring area adjacent to springhead (view to north)

Photograph 3. Tufa formation in western spring (oncoids and ooids in channel and cascade tufa on bank).

Photograph 4. Soil and tufa disturbance on bank and in channel in western spring

Photograph 5. Springs and seepage areas in recently disturbed area (view to east)

Photograph 6. Petrifying spring/ stream in scrub in eastern part of site

Photograph 7. Tufa formation in disturbed eastern spring area (oncoids and ooids in channel)

Photograph 8. Tufa formation in disturbed eastern spring area (spring water flowing over cascade)

Photograph 9. Tufa formation in disturbed eastern spring area (dislodged cascade tufa)

Photograph 10. Tufa formation in eastern spring area within scrub (cascade tufa on bank)

Photograph 11. Disturbed spring in central part of site (view to north)

Photograph 12. Disturbed spring in eastern part of site (view to west)

Photograph 13. Disturbed spring in central-eastern part of site (iron staining by bacteria indicating groundwater source to spring but little tufa formation as heavily disturbed)

I. OPW/MCC Culvert Correspondence

Joe Gibbons

From: Damien O'Brien <dobrien@meathcoco.ie>
Sent: Tuesday 16 June 2026 16:53
To: Joe Gibbons
Cc: Jinyu Qu; Gerry Boyle; Norbert McMahon
Subject: RE: 23-041 - Kildalkey Road
Attachments: 23-041-P502 - Proposed Future Culvert-Longitudinal Section.pdf; 23-041-P501 - Proposed Future Culvert.pdf; Culvert from Existing to Development Site.pdf; Outfall to River.pdf

Joe

After reviewing the below email and the drawings that were attached (attached for reference), the proposed 4m service corridor in your development is acceptable in principle. Please ensure the service corridor is highlighted on all services drawings to avoid any potential clashes/issues with other services/infrastructure. Please also ensure there are no structural foundations within 4m of the edge of the proposed services corridor.

Regards,

Damien O'Brien
Executive Engineer - Environment Department

Meath County Council
Buvinda House | Dublin Road | Navan | C15 Y291
Telephone: +353 46 9097200 **Mobile:** 0858032827
Email: dobrien@meathcoco.ie
Website: http://www.meath.ie

From: Joe Gibbons <j.gibbons@waterman-moylan.ie>
Sent: Friday 12 June 2026 17:12
To: Damien O'Brien <dobrien@meathcoco.ie>
Cc: Jinyu Qu <jiqu@meathcoco.ie>; Gerry Boyle <gerry.boyle@meathcoco.ie>
Subject: 23-041 - Kildalkey Road

Damien

Further to your email below please find attached the following:-

a) Outline design from the existing culvert to the development site. This is a basic calculation as we don't have topo survey for this area. From walking the site the existing ground rises at the culvert goes westwards and then falls relatively steeply when the culvert turns to the south. There is an average fall of 1 in 100 from the start of the culvert to the development site. We do not have GPR survey for the sections where the culvert goes through the existing roads.

b) detailed design for the culvert through the development site. We have also provided a long section with the primary sewers shown where they cross over or under the culvert. We have not shown the individual house connections. These will be at high level and the culvert will have to pass under them. It is likely that these would have to be temporarily disconnected and reconnected as the culvert is laid.

c) A high level detail of the culvert from the south of our development site to the River. Please note that this is a particularly sensitive area as it is in a SAC and there are also Tufa springs. Our project environmental consultants have advised that any works in this area are going to be very challenging to undertake without significant environmental impacts which will be extremely difficult to mitigate against. As these works are likely to be carried out by the OPW they might have some special dispensation. The site falls steeply from the end of our development. The natural fall is in the order of 1 in 12. It may be more appropriate to excavate a new ditch/drain at high level to allow the discharge from the bottom of our development site to the river to be via an open drain.

Hopefully the above together with the enclosed will assist in concluding this matter.

Regards,

Joe Gibbons
Director

waterman moylan

Download the latest edition of the Waterman Times here

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From: Damien O'Brien <dobrien@meathcoco.ie>
Sent: Wednesday 3 June 2026 13:27
To: Joe Gibbons <j.gibbons@waterman-moylan.ie>
Cc: Jinyu Qu <jiqu@meathcoco.ie>; Gerry Boyle <gerry.boyle@meathcoco.ie>
Subject: RE: 23-041 - Kildalkey Road

Joe

Thanks for the below/attached. See comments:

1. Route is acceptable in principle. We would need to see high level design with cover levels, invert levels, pipe gradients and finished road levels to see if a 4m corridor width is acceptable.
2. MCC will be satisfied with proposal once it is demonstrated that the proposed culvert could be constructed in the future. Clash checks and high level design required for this.

3. Can you show separation distances at any potential pinch points.
4. High level design to be extended to the river Boyne so depth of dig and proposed levels can be assessed. Also to be extended upstream to start of diversion.
5. MCC will coordinate relining of existing culvert with the OPW

Regards,

Damien O'Brien
Executive Engineer - Environment Department

Meath County Council
Buvinda House | Dublin Road | Navan | C15 Y291
Telephone: +353 46 9097200 **Mobile:** 0858032827
Email: dobrien@meathcoco.ie
Website: http://www.meath.ie

From: Joe Gibbons <j.gibbons@waterman-moylan.ie>
Sent: Tuesday 2 June 2026 16:49
To: Damien O'Brien <dobrien@meathcoco.ie>
Cc: Jinyu Qu <jiqu@meathcoco.ie>
Subject: 23-041 - Kildalkey Road

Hi Damien

Thank you for your email below.

It is possible in plan to squeeze a 1350mm diameter pipe down the eastern road on our site as shown on the attached drawing. I did discuss the possibility of introducing a grass verge on both sides of this road to provide more space for the pipe but our architect advises that he cannot widen the road reservation any more as he is already working to reduced garden sizes permitted by the compact settlement guidelines. In this regard he had to find space to the rear for cycle access required by Adrian Santry in order to avoid unsightly cycle storage units along the front of the houses.

It is all very tight and I am unsure if the space shown is acceptable to MCC. If it is then we can look in more detail at the design of the drainage around it and indeed the pipe itself to make sure that we don't have any pipe clashes.

You might consider the attached and revert when you get the chance.

Regards,

Joe Gibbons
Director

waterman moylan

Download the latest edition of the Waterman Times here

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J. Statement of Design Acceptance

Sidharth Kurella
Waterman Moylan
Block S
Alfie Byrne Road
Eastpoint Business Park
Dublin D03H3F4

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

12 June 2026

Re: Design Submission for Site At, Kildalkey Road, Trim, Meath (the "Development") (the "Design Submission") / Connection Reference No: CDS26001987

Dear Sidharth Kurella,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Antonio Garzón Mielgo
Email: antonio.garzonmielgo@water.ie

Yours sincerely,

Dermot Phelan

Dermot Phelan
Connections and Developer Services

Stiúrthóirí / Directors: Jerry Grant (Cathaoirleach / Chairperson), Niall Gleeson (POF / CEO), Douglas Millican, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh, Rena O'Sullivan and Orlagh Nevin.
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
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Appendix A

Document Title & Revision

- 23-041-P200 - Proposed Drainage Layout
- Foul Drainage longsections
- 23-041-P300 - Proposed Watermain Layout

Additional Comments

The design submission will be subject to further technical review at connection application stage.

Uisce Éireann cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

This Statement of Design Acceptance does not extend to proposed pump station and rising main arrangements. The pump station and rising main will be vested at connection application stage.

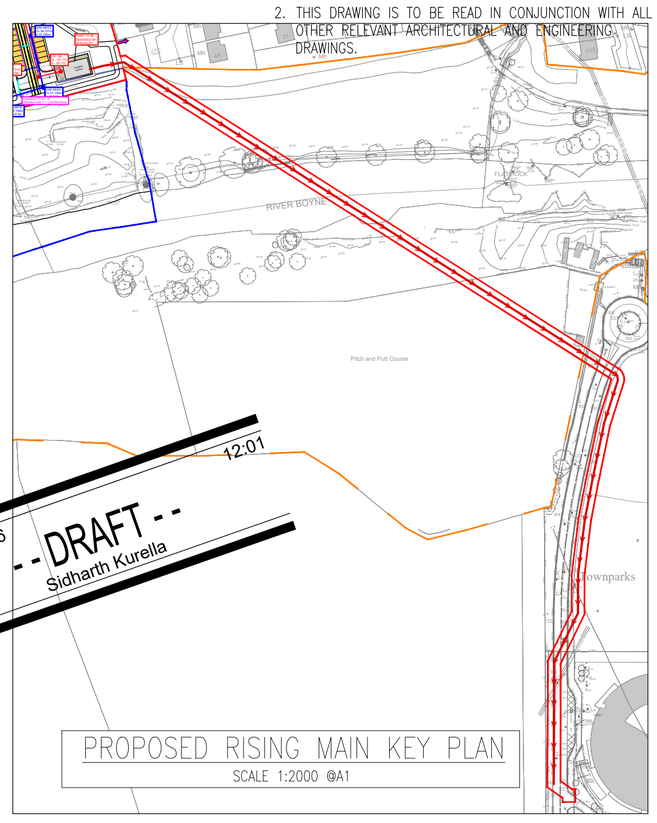
*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

This drawing should not be scaled. Dimensions to be verified on site.
Any discrepancies should be referred to the Engineer prior to work being put in hand.
This drawing is the property of Waterman Moylan Consulting Engineers Limited and is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorized person, either wholly or in part without the consent in writing of
Waterman Moylan Consulting Engineers Limited
Block S East Point Business Park Dublin D03 H3F4 Ireland
t +353 1 664 8900

NOTES:

1. DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS.



10 June 2026 12:01

- - DRAFT - -

Sidharth Kurella

PROPOSED RISING MAIN KEY PLAN

SCALE 1:2000 @A1

NOTE: ALL PRIVATE DWELLING SOAKWAYS TO BE 1.62cu.m

Soakaway Pit No. 1 Infiltration rate 'f' = 0.0108mm/sec
Soakaway Pit No. 2 Infiltration rate 'f' = 0.0430mm/sec
Soakaway Pit No. 3 Infiltration rate 'f' = 0.0920mm/sec
Soakaway Pit No. 4 Infiltration rate 'f' = 0.0127mm/sec
Soakaway Pit No. 5 Infiltration rate 'f' = 0.0053mm/sec
Soakaway Pit No. 6 Infiltration rate 'f' = 0.0062mm/sec
Soakaway Pit No. 7 Infiltration rate 'f' = 0.0088mm/sec
Soakaway Pit No. 8 Infiltration rate 'f' = 0.0056mm/sec
Soakaway Pit No. 9 Infiltration rate 'f' = 0.0175mm/sec
Soakaway Pit No. 10 Infiltration rate 'f' = 0.0077mm/sec
Soakaway Pit No. 11 Infiltration rate 'f' = 0.0078mm/sec
Soakaway Pit No. 12 Infiltration rate 'f' = 0.0061mm/sec
Soakaway Pit No. 13 Infiltration rate 'f' = 0.0245mm/sec
Soakaway Pit No. 14 Infiltration rate 'f' = 0.0125mm/sec
Soakaway Pit No. 15 Infiltration rate 'f' = 0.0149mm/sec
Soakaway Pit No. 16 Infiltration rate 'f' = 0.0079mm/sec

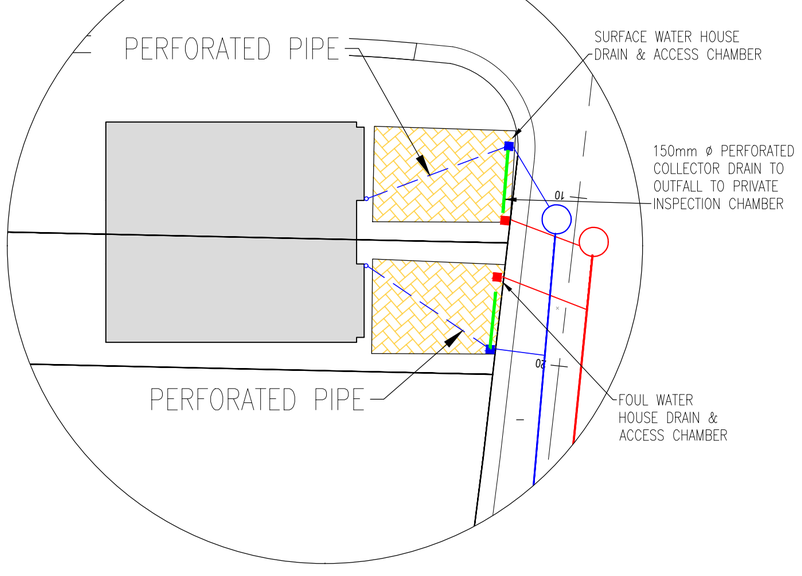
Soakaway 1 Top of soakaway :58.750m Base Level :57.550m Depth: 1.2m Volume=543.9 cu.m
Soakaway 2 Top of soakaway :57.00m Base Level :56.40m Depth: 0.6m Volume=86.4 cu.m
Soakaway 2 Top of soakaway :56.60m Base Level :56.00m Depth: 0.6m Volume=86.4 cu.m
Soakaway 2 Top of soakaway :56.00m Base Level :55.4m Depth: 0.6m Volume=86.4 cu.m
Soakaway 3 Top of soakaway :56.750m Base Level :56.150m Depth: 0.6m Volume=100.1 cu.m
Soakaway 4 Top of soakaway :55.500m Base Level :54.900m Depth: 0.6m Volume=85.6 cu.m

Block A
32 no. Apartments
16 x 1 bed & 16 x 2 bed
(4 storey)
Units 128 - 159

Public Open Space 1 670m²
Public Open Space 2 1152m²
Public Open Space 4 1110m²
Communal Open Space
Creche
Bike Store
Bin Store
Pumping Station

PROPOSED DRAINAGE LAYOUT

SCALE 1:500 @A1



TYPICAL PERMEABLE PAVING & PRIVATE DRAINAGE CONNECTIONS DETAIL

SCALE 1:250 @ A1

NOTE:
CONTRACTOR TO CONFIRM POSITION AND INVERT OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS. CONTRACTOR TO IMMEDIATELY INFORM ENGINEER IF ANY DISCREPANCIES ARE IDENTIFIED.

NOTE:
FOR DETAILS OF INSTALLATION PLEASE REFER TO IRISH WATERS 'CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE' & 'WASTEWATER INFRASTRUCTURE STANDARD DETAILS'

NOTE:
PUBLIC FOUL PIPE MATERIAL TO BE U-PVC (STIFFNESS CLASS 8) AND IN COMPLIANCE WITH SECTION 3.13 OF IRISH WATER CODE OF PRACTICE.

NOTE:
FOUL SEWERS TO BE CONSTRUCTED WITH CONCRETE SURROUND IN ACCORDANCE WITH IRISH WATER STD-WW-08 WHERE VERTICAL CLEARANCE FROM SURFACE WATER IS LESS THAN 300mm AND WHERE DEPTH OF COVER TO ROAD IS LESS THAN 1.2m

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1:2000 0 20m 40m 60m 80m 100m 120m 140m 160m 180m 200m
1:1 0 10 20 30 40 50 60 70 80 90 100
1:500 0 10m 20m 30m 40m 50m
1:1 0 10 20 30 40 50 60 70 80 90 100

LEGEND

- EXTENT OF WORKS
- F1 CL 7.16 IL 5.15 150mmø @1:200 — PROPOSED uPVC FOUL WATER SEWER WITH PIPE SIZE, GRADE, MANHOLE REF. AND INVERT LEVEL
- S1 CL 7.16 IL 5.15 225mmø @1:200 — PROPOSED SURFACE WATER SEWER WITH PIPE SIZE, GRADE, MANHOLE REF. AND INVERT LEVEL
- INDICATES PROPOSED ROAD GULLY AND CONNECTION
- INDICATES PROPOSED PERMEABLE PAVING
- PROPOSED STORM WATER HOUSE DRAIN AND ACCESS CHAMBER
- PROPOSED FOUL WATER HOUSE DRAIN AND ACCESS CHAMBER
- PROPOSED SWALE, WATER ACCESS CHAMBER & CONNECTION
- PROPOSED SOAKWAY WITH STORMTECH
- PROPOSED SOAKWAY WITH STONE
- PROPOSED FOUL RAISING MAIN
- INDICATES PROPOSED 1.35m DIA SWS PIPE (BY OTHERS)
- INDICATES 4.0m WAYLEAVE FOR 1.35m DIA SWS PIPE (BY OTHERS)
- INDICATES NSBP003 PETROL INTERCEPTOR

Rev	Date	Description	By	Chk
A	16/04/26	Layout Updates	SH	BG

Amendments

Project
KILDALKEY ROAD, TRIM, CO. MEATH

Title
PROPOSED DRAINAGE LAYOUT

Client
LOUGHGLYNN DEVELOPMENTS

waterman moylan
BLOCK S, EASTPOINT BUSINESS PARK, ALFIE BYRNE ROAD,
DUBLIN D03 H3F4 IRELAND. Tel: (01) 664 8900
Email: info@waterman-moylan.ie www.waterman-moylan.ie

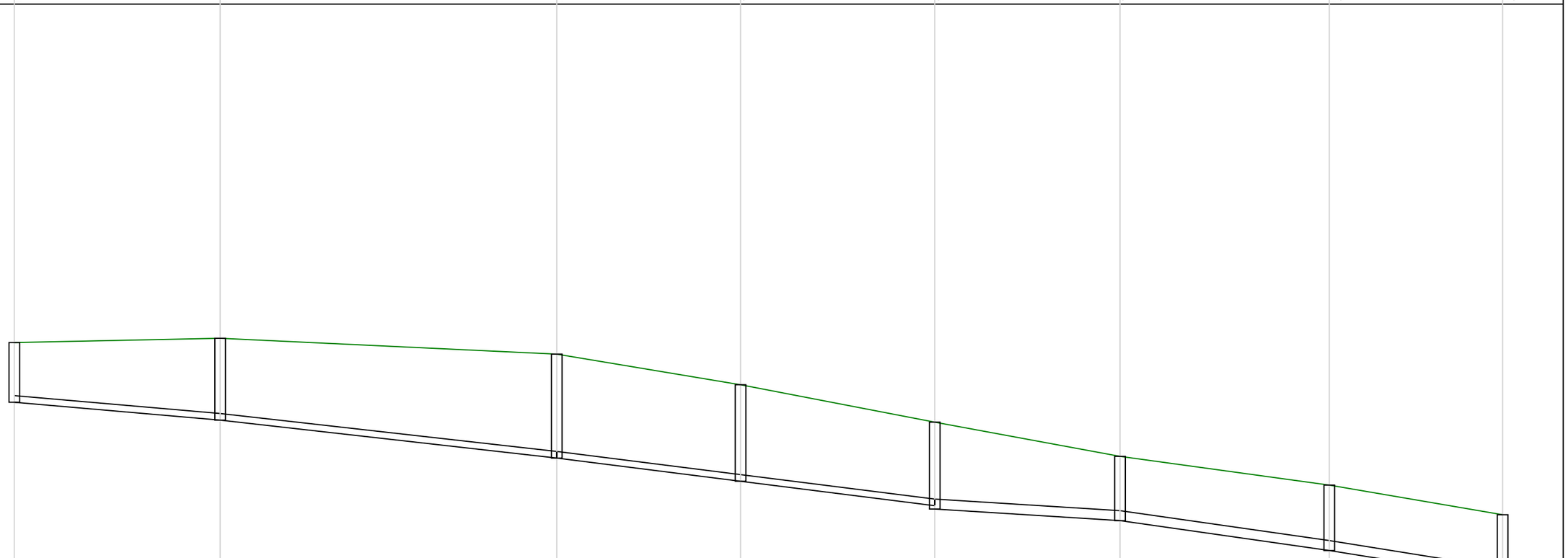
Status
FOR PLANNING ONLY

Designed By	Approved	Waterman Ref
		23-041
Drawn By	Date	Scales @ A1
	NOV. 2025	AS SHOWN@A1

Project - Originator - Volume - Level - Type - Role - Number: TRIM - WAT - ZZ - XX - DR - C - P200

Revision: A

Drawing Location: \\wmfilesvr\Moylan23-25\Projects\23\23-041 Trim Co Meath\Drawings\Waterman Moylan\Civil\Planning\Autocad Drawings\23-041-P200 - Proposed Drainage Layout.dwg
Date: Jun 10, 2026 - 12:01pm

Node Name	1	2	4	5	8	9	10	13
								
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 52.000								
Link Name	1.000	1.001	1.002	1.003	1.004	1.005	1.006	
Section Type	150mm	150mm	150mm	150mm	225mm	225mm	225mm	
Slope (1:X)	57.6	44.3	39.7	39.7	80.0	35.0	31.2	
Cover Level (m)	64.553	64.650	64.291	63.599	62.753	61.980	61.330	60.660
Invert Level (m)	63.203	62.799 / 62.799	61.941 / 61.941	61.417 / 61.417	60.864 / 60.789	60.527 / 60.527	59.851 / 59.851	59.223
Length (m)	23.264	38.046	20.774	21.950	20.936	23.657	19.590	

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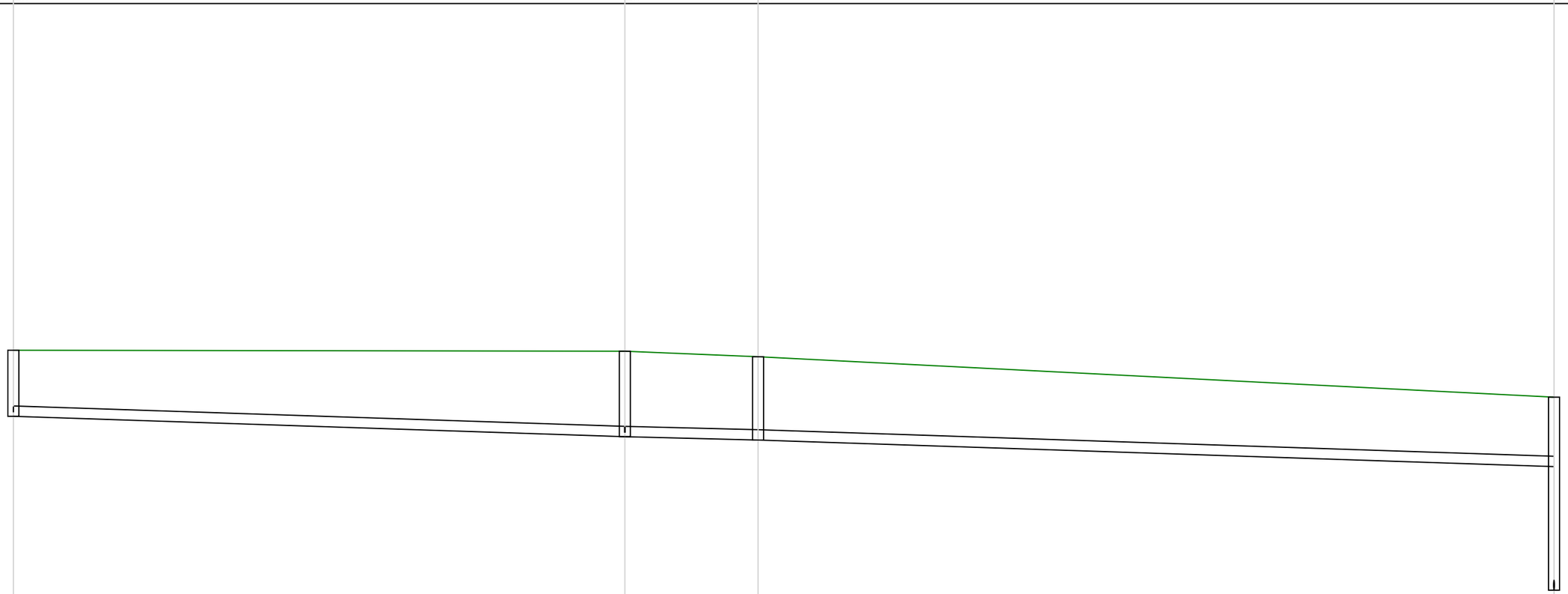
Node Name	13		15	16		26
						
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 48.000						
Link Name		1.007		1.008	1.009	
Section Type		225mm		225mm	225mm	
Slope (1:X)		150.0		200.0	150.0	
Cover Level (m)	60.660		60.639	60.519		59.639
Invert Level (m)	59.223	58.779	58.779	58.706	58.706	58.128
Length (m)		66.571		14.500	86.658	

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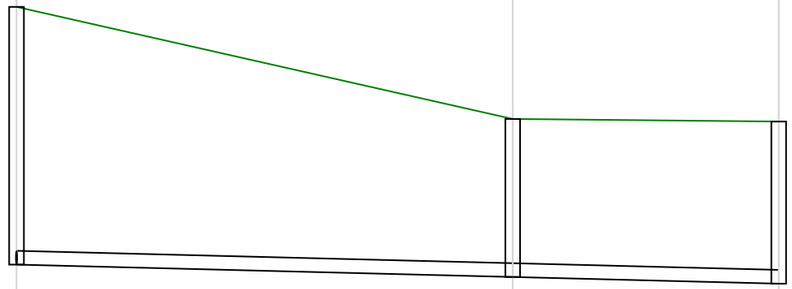
Node Name		26	27	28
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 47.000				
Link Name		1.010	1.011	
Section Type		225mm	225mm	
Slope (1:X)		200.2	199.0	
Cover Level (m)		59.639	57.812	57.770
Invert Level (m)		55.438	55.236 / 55.236	55.127
Length (m)		40.448	21.686	

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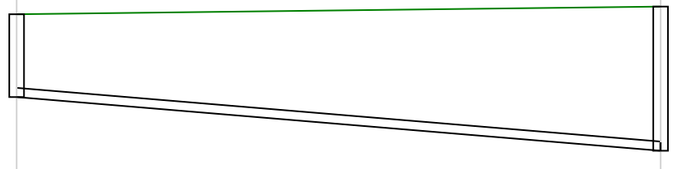
Node Name		3		4
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 53.000				
Link Name		2.000		
Section Type		150mm		
Slope (1:X)		60.0		
Cover Level (m)		64.166		64.291
Invert Level (m)		62.816		61.941
Length (m)		52.495		

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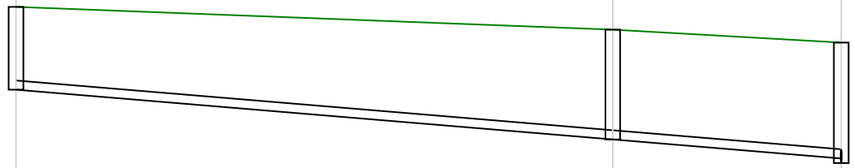
Node Name		6	7	8
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 52.000				
Link Name		3.000	3.001	
Section Type		150mm	150mm	
Slope (1:X)		60.0	60.1	
Cover Level (m)		63.335	62.964	62.753
Invert Level (m)		61.985	61.174 61.174	60.864
Length (m)		48.651	18.621	

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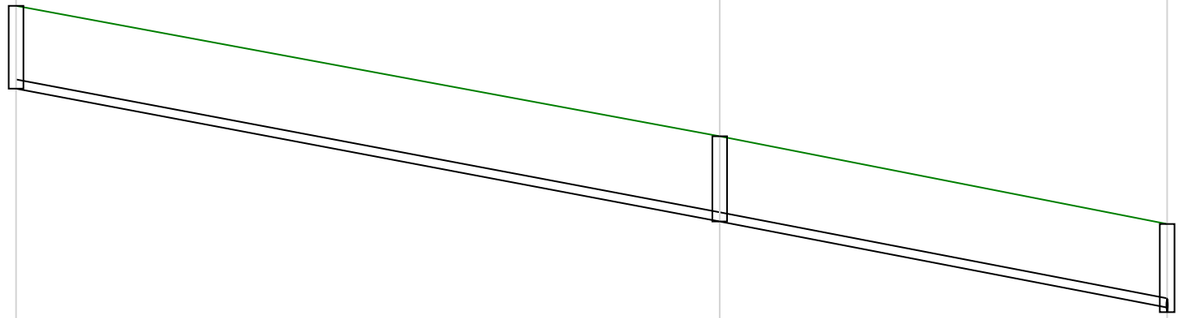
Node Name		11	12	13
				
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 52.000				
Link Name		4.000	4.001	
Section Type		150mm	150mm	
Slope (1:X)		26.5	26.0	
Cover Level (m)		64.216	62.090	60.660
Invert Level (m)		62.866	60.701 / 60.701	59.298
Length (m)		57.361	36.478	

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Node Name		14	15
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 50.000			
Link Name		5.000	
Section Type		150mm	
Slope (1:X)		25.5	
Cover Level (m)		60.729	60.639
Invert Level (m)		59.379	58.854
Length (m)		13.366	

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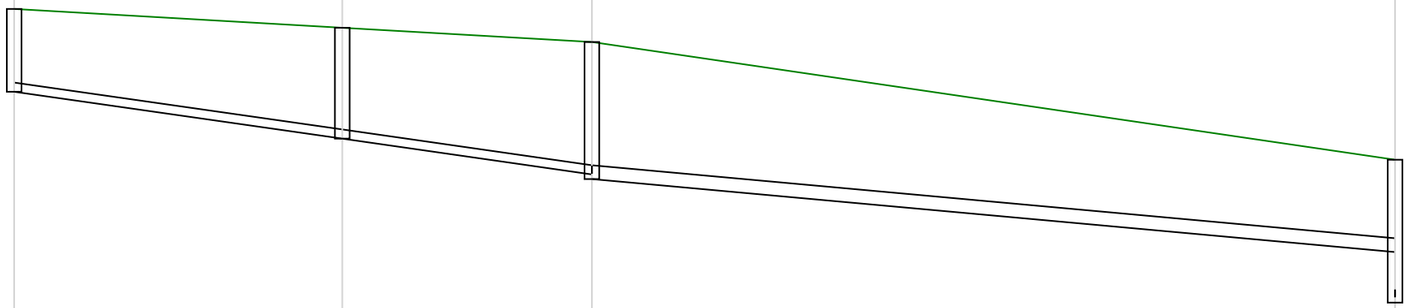
Node Name		17	18	20	22
					
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 49.000					
Link Name		6.000	6.001	6.002	
Section Type		150mm	150mm	225mm	
Slope (1:X)		35.0	34.8	55.0	
Cover Level (m)		61.149	60.842	60.610	58.691
Invert Level (m)		59.799	59.035 / 59.035	58.451 / 58.376	57.186
Length (m)		26.748	20.350	65.474	

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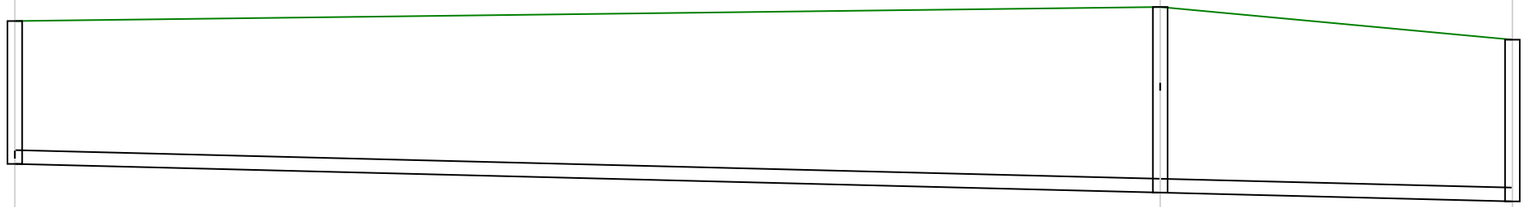
Node Name		22		24		25
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 47.000						
Link Name		6.003		6.004		
Section Type		225mm		225mm		
Slope (1:X)		200.0		199.4		
Cover Level (m)		58.691		58.920		58.387
Invert Level (m)		56.362		55.895	55.895	55.751
Length (m)		93.374		28.711		

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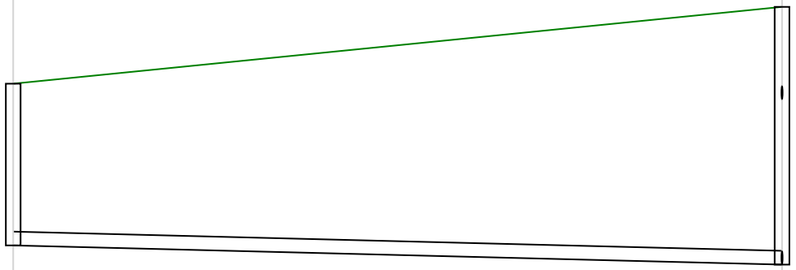
Node Name	25	26
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 47.000		
Link Name	6.005	
Section Type	225mm	
Slope (1:X)	200.2	
Cover Level (m)	58.387	59.639
Invert Level (m)	55.751	55.438
Length (m)	62.676	

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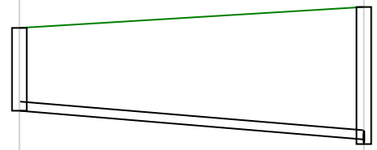
Node Name		19	20
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 49.000			
Link Name		7.000	
Section Type		150mm	
Slope (1:X)		60.0	
Cover Level (m)		60.269	60.610
Invert Level (m)		58.919	58.451
Length (m)		28.084	

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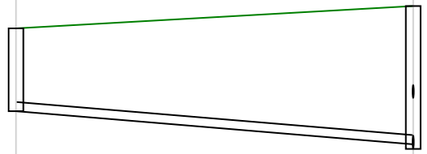
Node Name		21	22
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 47.000			
Link Name		8.000	
Section Type		150mm	
Slope (1:X)		60.0	
Cover Level (m)		58.327	58.691
Invert Level (m)		56.977	56.437
Length (m)		32.377	

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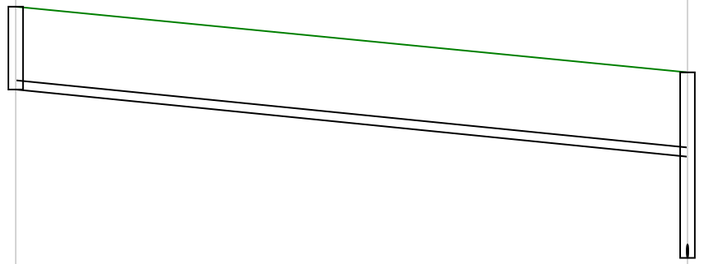
Node Name	23	24
A3 drawing Hor Scale 500 Ver Scale 100 Datum (m) 48.000		
Link Name	9.000	
Section Type	150mm	
Slope (1:X)	50.0	
Cover Level (m)	59.990	58.920
Invert Level (m)	58.640	57.545
Length (m)	54.766	

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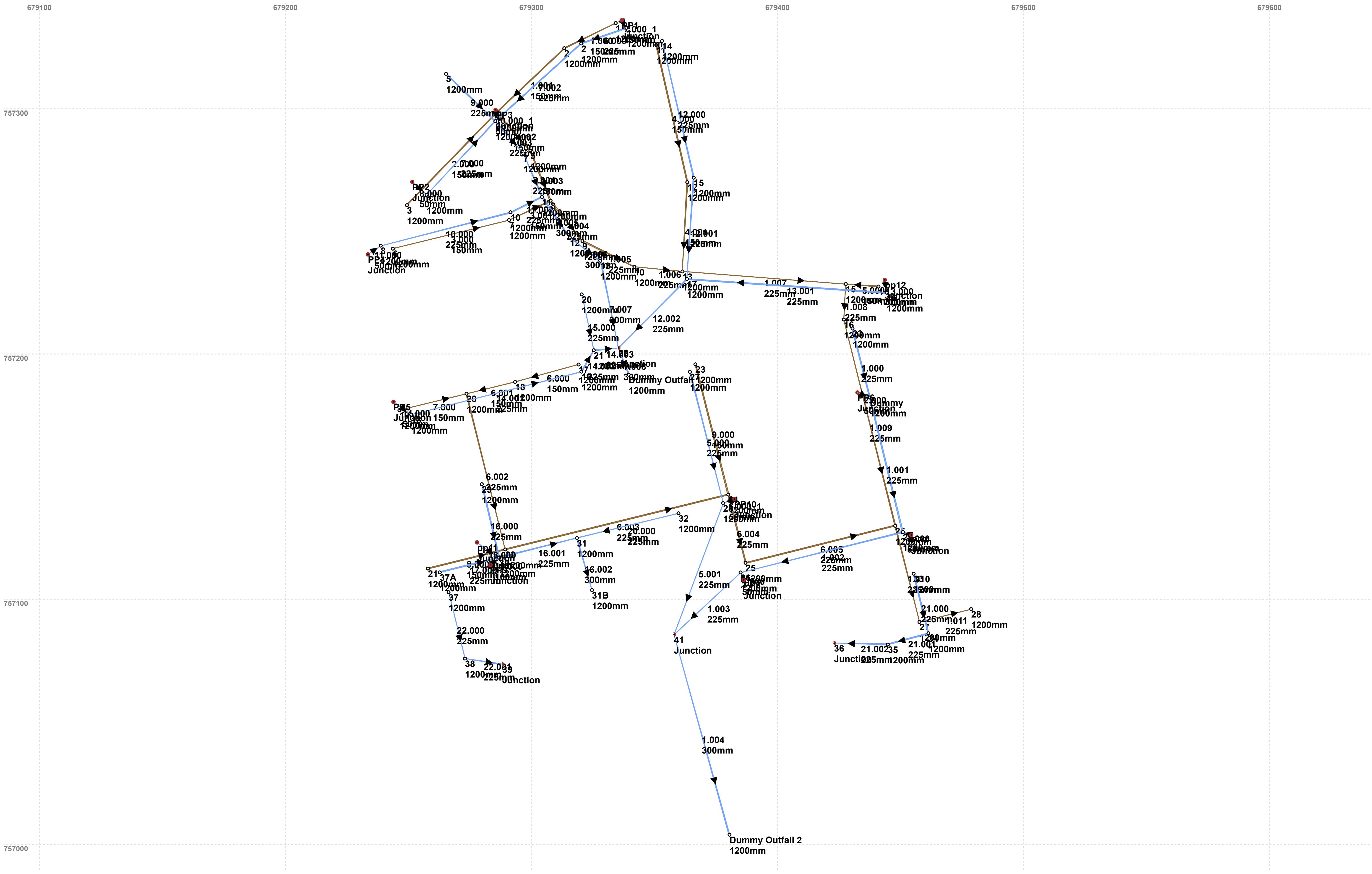

679100
679200
679300
679400
679500
679600
757300
757200
757100
757000
Dummy Outfall 2
1200mm
1.004
300mm
41
Junction
1.003
225mm
5.001
225mm
9.000
5.000
225mm
12.002
225mm
1.007
225mm
13.001
225mm
1.009
225mm
1.001
225mm
1.000
225mm
6.002
225mm
16.000
225mm
16.001
225mm
16.002
300mm
31B
1200mm
22.000
225mm
21.000
225mm
28
1200mm
6.005
225mm
6.004
225mm
12.000
225mm
15.000
225mm

This drawing should not be scaled. Dimensions to be verified on site.
Any discrepancies should be referred to the Engineer prior to work being put in hand.
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Waterman Moylan Consulting Engineers Limited
Block S East Point Business Park Dublin D03 H3F4 Ireland
t +353 1 664 8900

NOTES:

1. DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS.

NOTE:
FOR DETAILS OF INSTALLATION PLEASE REFER TO IRISH WATERS 'CODE OF PRACTICE FOR WATER INFRASTRUCTURE' & 'WATER INFRASTRUCTURE STANDARD DETAILS'

NOTE:
WATERMAIN MATERIAL TO BE PE 100 (SDR 11 OR 17) IN COMPLIANCE WITH SECTION 3.9 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

NOTE:
AIR VALVE AND HYDRANTS COVERS, WHERE LOCATED IN GRASS AREAS, SHALL BE SURROUNDED BY A CONCRETE PLINTH IN COMPLIANCE WITH SECTION 3.18 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

NOTE:
THRUST BLOCKS TO BE PROVIDED AT EACH BEND ALONG THE COURSE OF THE WATERMAIN IN COMPLIANCE WITH SECTION 4.6 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

NOTE:
ENSURE DEPTH OF COVER TO WATERMAIN CROWN IS ACHIEVED IN COMPLIANCE WITH SECTION 3.11 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

NOTE:
METERS FOR APARTMENTS OR SIMILAR PROPERTIES WILL BE INSTALLED INTERNALLY WITHIN THE PREMISES IN ACCORDANCE WITH THE BUILDING CONTROLS AUTHORITY REQUIREMENTS AND SUBJECT TO REVIEW BY IRISH WATER. 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

CONNECTION TO EXISTING WATERMAIN

PROPOSED BULK WATER METER TO IRISH WATER REQUIREMENTS

BULK WATER METER TO IRISH WATER STANDARD DETAIL STD-W-26.

WASHOUT HYDRANT (STD-W-30A)

CONNECTION TO EXISTING WATERMAIN

EX 100mm ø uPVC

EX 100mm ø uPVC

PROPOSED BULK WATER METER TO IRISH WATER REQUIREMENTS

BULK WATER METER TO IRISH WATER STANDARD DETAIL STD-W-26.

WATER FEED TO PROPOSED FOUL PUMP STATION

SAC

Kildalkey Road

ELDER DRIVE

Reservation for Existing Hedgerow and Trees

Public Open Space 1 670m² (pocket park)

Public Open Space 2 2,552m²

Public Open Space 3 4,510m²

Public Open Space 4 1110m²

Communal Open Space 276m²

Communal Open Space 314m²

Kickabout Area

Creche 50mm ø -L 63.50

Block A
32 no. Apartments
16 x 1 bed & 16 x 2 bed
(4 storey)
Units 128 - 159

Units 160 - 183

Pumping Station

CURRENT LOCATION OF ST. PATRICK'S HOLY WELL ACCORDING TO LOCAL VENERATORS

LEGEND

- EXTENT OF WORKS
- PROPOSED 150mmØ PE WATERMAIN
- SV — PROPOSED SLUICE VALVE
- H — PROPOSED HYDRANT
- ScV — PROPOSED SCOUR VALVE
- BB — PROPOSED BOUNDARY BOX
- BM — PROPOSED BULK WATER METER
- AV — PROPOSED AIR VALVE
- EX XXXmm ø WM — EXISTING WATERMAIN
- SERVICE CONNECTION 32MMØ
- SERVICE CONNECTION
- WO — PROPOSED WASHOUT HYDRANT (STD-W-30A)

PROPOSED WATERMAIN LAYOUT

SCALE 1:500 @A1

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1:500 0 10m 20m 30m 40m 50m

1:1 0 10 20 30 40 50 60 70 80 90 100

Rev	Date	Description	By	Chk
A	16/04/26	Layout Updates	SH	BG

Amendments

Project
KILDALKEY ROAD,
TRIM, CO. MEATH

Title
PROPOSED WATERMAIN LAYOUT

Client
LOUGH GLYNN DEVELOPMENTS

BLOCK S, EASTPOINT BUSINESS PARK, ALFIE BYRNE ROAD,
DUBLIN D03 H3F4 IRELAND. Tel: (01) 664 8900
Email: info@waterman-moylan.ie www.waterman-moylan.ie

Status
FOR PLANNING ONLY

Designed By	Approved	Waterman Ref
SK	BG	23-041
Drawn By	Date	Scales @ A1
VU	OCT. 2025	1:500 @A1

Project - Originator - Volume - Level - Type - Role - Number: TRIM - WAT - ZZ - XX - DR - C - P300

Revision: A

Drawing Location: N:\Projects\23\23-041 Trim Co Meath\Drawings\Waterman Moylan\Civil\Planning\Autocad Drawings\23-041-P300 - Proposed Watermain Layout.dwg
Date: Apr 24, 2026 - 3:34pm

K. Additional Trial Holes

Trial Hole No 1 – Excavated to 2.2m – No rock encountered – Sandy gravel with some round and angular boulders.

Trial Hole – Excavated to 2.2m. Generally gravel with larger rounded boulders some of which were breaking when they were being excavated.

Trial Hole 3 – Dug to 2.1m Gravel with rounded and angular boulders

Trial Hole 4 – Dug to 2.2m Gravel with rounded and angular cobbles/stone.

UK and Ireland Office Locations