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APPENDIX 4-3

CIVILS WORKS DESIGN REPORT

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Kingston Stables Ltd.

Residential Development at Kingston, Knocknacarra, Galway.

Civil Works Design Report
LRD West

BUILT ON KNOWLEDGE

Document Control Sheet	
Document Reference	Civil Works Design Report
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1. INTRODUCTION

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TOBIN were appointed by Kingston Stables Ltd. to provide engineering consultancy services for a proposed Large Residential Development (LRD) at Kingston, Knocknacarra, Galway, off the Western Distributor Road in Knocknacarra. The site development description is as follows:

Planning permission is sought by Kingston Stables Limited for development of a Large-Scale Residential Development (LRD) for a 10-year planning permission, on a site which extends to 2.9 ha on lands located at Rahoon, Knocknacarra, Galway.

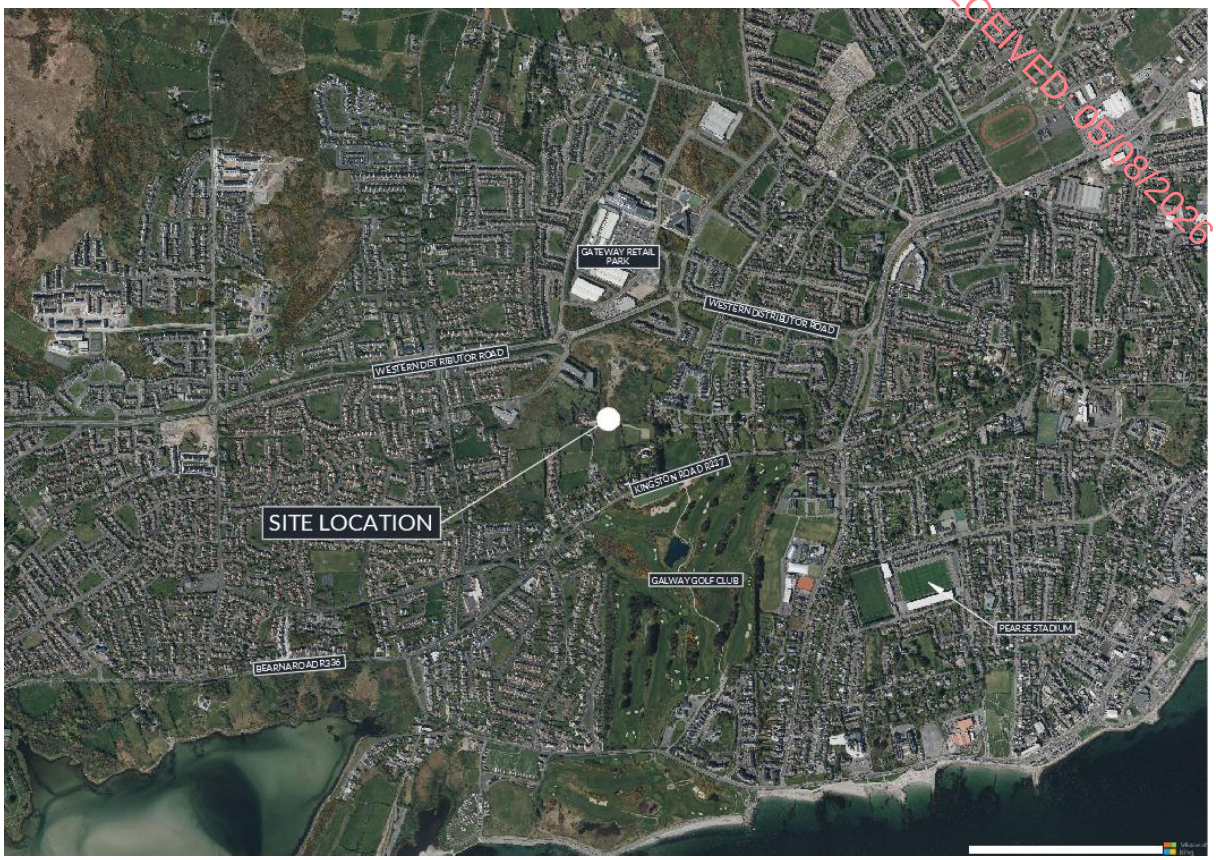
The proposed development will consist of the following:

1. Provision of 133 no. residential units in 2 no. development areas with a mix of duplex and house types on a site area of 2.9 ha. The buildings range between 2 no. and 3 no. storeys in height. The development will comprise the following:
    - 51 no. 3-bed townhouses;
    - 6 no. 4-bed townhouses;
    - 1 no. 1-bed duplex apartments;
    - 1 no. 2-bed duplex houses;
    - 37 no. 2-bed ground floor duplex apartments;
    - 37 no. 3-bed duplex houses.
2. Demolition of existing structures (388 sqm);
3. Vehicular access to the proposed development from a permitted road (Planning Reference 24/60370 refers);
4. Upgrades to the permitted road (Planning Reference 24/60370 refers);
5. Pedestrian and cycle access to the adjacent proposed Kingston Park (ACP Ref: 323873);
6. Conversion and upgrade of an existing structure to a cafe (65.8 sqm);
7. The provision of public open space;
8. The provision of 192 no. bicycle parking spaces;
9. The provision of 143 no. car parking spaces;
10. Public lighting, bin stores, signage, services, 2 no. ground mounted substation kiosks, site landscaping and all ancillary site development and enabling works.

This report outlines the civil works planning submission for the proposed development, detailing the wastewater drainage, proposed surface water drainage, watermain design and connection details, roads design, and SuDS measures. The site location is presented in Figure 1 below, and the site layout is shown graphically in the design team drawings accompanying this application. This report should be read in conjunction with the foul and storm drainage, watermain, roads, and SuDS design drawings submitted as part of the planning application. It is to be noted that this planning application forms part of a wider strategic 'Masterplan' for the comprehensive development of the area. All aspects of the proposed development—including water supply, wastewater infrastructure, and surface water management—have been fully integrated with and informed by the overarching Masterplan for the area. Further details regarding the design intent, phasing, and integration with surrounding lands are provided in the Architect's Design Statement, submitted separately as part of this application.

Figure 1 – Site Location (Microsoft Bing)

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1.1 WASTEWATER DRAINAGE OVERVIEW

Wastewater generated from the proposed development will outfall via gravity to an existing Uisce Eireann (UE) owned 375mm foul sewer line located west of the development along the southern arm junction of the adjacent roundabout and Altan Road.

The foul sewer network is designed using Causeway Flow drainage modelling software. Outputs from the foul sewer design, and long sections are attached in **Appendix A** of this document. The proposed foul sewer network is presented graphically on engineering design drawings that accompany this report as separate documents.

A pre-connection application was submitted to Uisce Eireann for the wastewater demand for the proposed development. A Confirmation of Feasibility (CoF) letter was received from Uisce Eireann and is provided in **Appendix E** of this report.

The full wastewater drainage design was fully vetted by Uisce Eireann to receive a Statement of Design Acceptance prior for the submission of this planning application also appended in **Appendix E** . Upon grant of planning all foul sewer designs will be fully vetted by Uisce Eireann prior to receiving a connection offer agreement.

1.2 SURFACE WATER DRAINAGE OVERVIEW

The stormwater drainage infrastructure incorporates the principles of nature-based Sustainable Drainage Systems (SuDS) to manage surface water runoff quantity and quality, in accordance with the Galway City Development Plan 2023–2029 (Policy 9.5). However, in line

with CIRIA SuDS guidance, exceedance measures will also be provided to account for the potential seasonal underperformance or failure of surface SuDS features. In such cases, the system will revert to a conventional drainage network design, with exceedance flows directed into the piped network where any or all SuDS features become overwhelmed.

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The stormwater drainage network is designed using Causeway Flow drainage modelling software. Outputs from the stormwater drainage design, and long sections are attached in **Appendix B** of this document. The proposed stormwater drainage network is presented graphically on engineering design drawings that accompany this report as separate documents.

Infiltration testing has been conducted on site to establish infiltration rates at various strategic locations for possible reduction of attenuation units and inclusion of soakaways and other proposed SuDS measures, Refer to **Appendix F** for Soakaway testing locations and results.

The proposed storm water drainage system is designed to cater for all surface water runoff from all hard surfaces in the proposed development including roadways, roofs, parking areas etc. All stormwater generated on site from roadways and roofs will discharge via an Oil/Petrol Interceptor to soakaways/attenuation units to remove possible hydrocarbons. The soakaway/attenuation units will be strategically situated within the site.

The maximum and minimum pipe sizes being between 450mm and 225mm respectively. All velocities fall within the limits of 0.75m/sec and 3m/sec as set out in 'Recommendations for Site Development Works' as published by the Department of Environment.

Where there is adequate infiltration storm water will discharge to ground via nature-based SuDS solutions and proposed soakaways, or otherwise at a controlled Greenfield runoff rate to the existing 450mm storm sewer network located west of the development along the southern arm junction of the adjacent roundabout and Altan Road. It is stressed that the current design will not rely fully on infiltration to ground (in anticipation of extensive bedrock across the site). However, a conservative use of infiltration will be adopted into the design where applicable.

It is proposed to install by-pass separators prior to discharging to the proposed soakaways/attenuation units and existing storm sewer. The separators will be sized to cater for the impermeable areas, i.e., roads, car parking and footpath areas of the site to which they have been allocated.

The entire stormwater network will be designed to handle a 100-year storm event plus an additional 20% capacity to account for climate change.

1.3 WATERMAIN OVERVIEW

The watermain layout will be designed in accordance with Uisce Eireann Code of Practice for Watermain Infrastructure IW-CDS-5020-03. It is proposed to connect the watermain for the development off the watermain to be constructed as part of the permitted works which form part of the overall masterplan for the area. This watermain is a 150mm watermain permitted by Galway City Council (Planning Reference 24/60370), which in turn connects to an Uisce Eireann owned 150mm watermain that runs along the western boundary along the southern arm junction of the adjacent Western Distributor Road roundabout and Altan Road.

An arterial 150mm main will be brought into the development with 100mm watermain branches serving the clusters of houses and cul-de-sacs. The watermain for this development will also tie

into the proposed residential development, located east of this site, which is currently under review by Galway City Council for planning having been submitted as a separate application (LRD 02/26 Kingston Stables - Phase 2).

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In accordance with Local authority/Uisce Eireann standards, a water meter and Logging Device (Larson Type) are proposed at the entrance of the connection into the proposed site. A sluice valve, strainer and 150mm diameter by-pass arrangement are also proposed to allow for possible disconnection of water meters by the Local Authority/ Uisce Eireann.

A pre-connection application was submitted to Uisce Eireann for the wastewater demand for the proposed development. A Confirmation of Feasibility (CoF) letter was received from Uisce Eireann and is provided in **Appendix E** of this report.

The full watermain design was fully vetted by Uisce Eireann to receive a Statement of Design Acceptance prior for the submission of this planning application also appended in **Appendix E** . Upon grant of planning all watermain designs will be fully vetted by Uisce Eireann prior to receiving a connection offer agreement.

1.4 ROADS OVERVIEW

Vehicular access is proposed from an existing roundabout on the Western Distributor Road, off the southern arm junction. Due to the large scale of the Masterplan development, upgrade works to the southern arm junction have been permitted by Galway City Council (Planning Reference 24/60370). Currently the junction services Altan, an existing residential development, and Knocknacarra National School. The permitted road layout, (Planning Reference 24/60370), amends the alignment of this road to have the access to the proposed development as the major road, with the school access being the minor road. Discussions have been held with Galway City Council to include arrangements to tie in with the Active Travel Scheme proposed for the overall masterplan of the area.

In accordance with the Cycle Design Manual's guidance for low-speed, low-trafficked environments, cyclists are accommodated within the carriageway, of this proposed development, as part of a shared-use arrangement with vehicles. This approach is deemed appropriate given the anticipated traffic volumes and speeds, while also supporting a legible, low-stress cycling environment throughout the development lands. The proposed layout enables seamless integration with the wider Active Travel scheme identified in the overall masterplan, ensuring continuous and coherent connectivity for cyclists and pedestrians. In particular, the design provides a strategic tie-in point to the adjacent Galway City Council (GCC) lands and proposed rugby pitch area, thereby enhancing permeability and supporting sustainable travel patterns across the broader area.

Additional pedestrian and cyclist connections are proposed throughout the development to enhance permeability and promote sustainable modes of transport. Notably, Millers Lane will be extended at the northeast corner of the site, as per the permitted road layout, (Planning Reference 24/60370), introducing a 4-metre-wide shared pedestrian and cycleway. This route will traverse from Millers Lane southwards and tie into the proposed segregated pedestrian footpath and cycle lanes, ensuring connectivity to all key areas.

The proposed maximum speed limit within the development is to be 30km/h, with appropriate traffic control measures where suitable.

Proposed road widths throughout the development will vary from 4.8m for 'Homezone' areas, to 5.5m where footpaths are separated from the vehicle carriageway for pedestrian mobility. All internal roads have been designed in accordance with the requirements of DMURS and the Recommendations for Site Development Works for Housing Areas.

Autotrack vehicle swept path analysis have been completed for the proposed site layout for a Large Car, a Refuse Truck and a Fire Tender to ensure the vehicles can safely manoeuvre around the site.

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2. WASTEWATER DRAINAGE NETWORK DESIGN

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2.1 INTRODUCTION

All wastewater generated from the proposed development will outfall, via gravity, to a wastewater network permitted by Galway City Council (Planning Reference 24/60370). From this the wastewater will discharge to an existing Uisce Eireann (UE) owned 375mm foul sewer line located west of the development along the southern arm junction of the adjacent roundabout and Altan Road.

The proposed foul network is designed using Causeway Flow Drainage modelling software. Outputs from the foul sewer design, and long sections are attached in **Appendix A** of this document. The proposed foul sewer network is graphically represented on the engineering drainage drawings which accompany this document as part of the planning submission.

The pipework for the wastewater drainage system will be designed to provide six times the dry weather flow in accordance with the Uisce Eireann Code of practice and standard details- Appendix B – Gravity Sewer Design Requirements, section 2.2.5 Domestic Wastewater Peaking Factors.

2.2 LOADING RATES

An average rate of 2.7 P.E. per dwelling has been used for the development to account for the varying unit occupancies. The sewer network is designed to cater for six times the dry weather flow rate. The occupancy per dwelling figures have been obtained from the Uisce Eireann Codes of Practice as per Wastewater Code of Practice, Appendix B – Gravity Sewer Design Requirements, section 2.2.1 Housing Density & Occupancy.

A flow of 150 litres per head per day plus an additional 10% allowance to account for infiltration within a new development have been considered in the foul sewer design as per Uisce Eireann Code of Practice for Wastewater Infrastructure - Section 3.6 Hydraulic Design for Gravity Sewers.

2.3 WASTEWATER NETWORK DESIGN

The foul sewer drainage services will be designed to take account of the requirements of the Civil Engineering Specification for the Water Industry (CESWI), subject to the requirements applied to it by Uisce Eireann, as outlined in the Uisce Eireann Code of Practice for Wastewater Infrastructure. Other design guidelines adhered to include the Department of Environment 'Recommendations for Site Development Works for Housing Areas", 1998, and "Sewers for Adoption' published by WRC, UK.

It is proposed that all pipes will be thermoplastic structured wall pipes with the maximum and minimum pipe sizes being between 300mm and 150mm respectively. The maximum and minimum pipe gradients shall fall between 1/30 and 1/200. All velocities at said gradients will fall within the limits of 0.75m/sec and 3m/sec as set out in Uisce Eireann Code of Practice for Wastewater Infrastructure and 'Recommendations for Site Development Works' as published by the Department of Environment.

The pipework for the drainage system will be designed to provide for six times the dry weather flow in accordance with the Recommendations for Site Development Works as published by the

Department of the Environment and Local Government and to Uisce Eireann Code of Practice and Standard Details.

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3. SURFACE WATER DRAINAGE NETWORK DESIGN

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3.1 INTRODUCTION

The stormwater drainage design has been undertaken using Causeway Flow modelling software. The analysis considered the 30-year and 100-year return period plus an additional 10% and 20% respectively to account for the effects of climate change. The design inputs, results and outputs from the Causeway Flow analysis are appended to this document in **Appendix B**.

The proposed storm water networks are presented graphically on the engineering drainage and SuDS layout drawings that accompany this report as separate documents. The design will also consider the wider site of the Masterplan for the area, ensuring that any potential future development can be accommodated within the surface water management strategy.

There is an existing Galway City Council 450mm surface water network located west of the proposed development. All surface water within development has been designed to flow via gravity and attenuate within the site boundaries. Strategically placed SuDS measures and attenuation/soakaway units will attenuate the surface water prior to any outfall to the existing network at a controlled Greenfield run-off rate using hydrobrake flow control manholes. High-level outfalls will be set at such levels below the lowest ground level on the network should the attenuation storage reach its full capacity to eliminate the risk of flooding in extreme weather events.

The amount of water discharged from the final hydro brake manhole before entering the existing stormwater network has been determined by using the calculated allowable Greenfield Runoff rate for the developable area of the site. The greenfield runoff rate was calculated for the developable area using the site location and the HR Wallingford Greenfield Runoff Tool online. Refer to **Appendix C** for the Greenfield Runoff estimation report for the site.

The surface water entering the network will include run-off from the roadways and parking areas throughout the site and therefore may require the removal of hydrocarbons. Prior to discharge to the existing network the surface water will flow through an oil/petrol interceptor, sized to cater for the catchment area it services, which will remove these hydrocarbons.

Where appropriate, storage units will be lined with a permeable geotextile membrane to facilitate surface water infiltration through the perimeter into the surrounding medium, thereby leveraging any infiltration capacity identified in the surrounding soils. Infiltration testing has been undertaken as part of the site assessment and the results are attached in **Appendix F**. While infiltration is not relied upon for all attenuation units, it will be applied selectively where ground conditions have been confirmed to be suitable.

A range of nature-based Sustainable Drainage Systems (SuDS) measures—including tree pits, infiltration trenches and rain gardens—will be strategically located across the development to manage surface water and achieve greenfield runoff rates. These features have been carefully coordinated with the landscape architect throughout the planning and design process to ensure integration with the overall site layout and landscape strategy. Where ground conditions permit, surface water will infiltrate naturally. To ensure resilience and safeguard against exceedance events, each SuDS element will incorporate a high-level outfall connected to the surface water drainage network. This approach aligns with best practice in sustainable urban

drainage and supports compliance with planning policy objectives for climate adaptation and water management.

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Precast concrete gullies, including lockable cast iron grating and frame, and drainage kerbs will be provided where needed to collect run-off from road and parking areas to mitigate any flooding. The proposed surface water pipe diameters are between 225mm and 450mm and will be laid at gradients to ensure self-cleansing and to prevent scour. All velocities fall within the limits of 0.75 and 3m/sec as set out in 'Recommendations for Site Development Works' as published by the Department for the Environment.

The following parameters will form the basis of the design for all networks:

- A design return period of 1 year has been adopted for the sewer network in accordance with good design practice.
- The rainfall intensity is based on rainfall data received from Met Eireann at the coordinates of the site in question.
- Minimum self-cleansing velocity of 0.75m/s
- M5-60 = 15.400mm
- Ratio R = 0.254

In accordance with the requirements of Galway City Council, a Stormwater Management Audit has been carried out on the proposed design for the planning application submission. The audit report will accompany this document for the planning submission as a separate document.

3.2 Sustainable Urban Drainage Systems

The existing site is currently a greenfield site with no existing surface water drainage or SuDS measures in place. To limit surface water runoff from the site, the surface water drainage for the proposed development has been designed in accordance with the principles of Sustainable Urban Drainage Systems (SuDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS) and align with the Galway City Development Plan 2023-2029, Policy 9.5. These address the issue of sustainability by requiring designs to comply with a set of drainage criteria which aim to minimise the impact of urbanisation by replicating the runoff characteristics of the partly brownfield site.

The requirements of SuDS are typically addressed by provision of the following components:

- ✓ Interception storage
- ✓ Treatment storage (not required if interception storage is provided)
- ✓ Attenuation storage
- ✓ Long term storage (if this is not required growth rates should not be applied to Q_{bar})

For the subject site, interception storage will be achieved through the implementation of SuDS measures and infiltration/attenuation storage units. Growth factors will be applied to the allowable discharge for the 100-year event. Consequently, treatment storage and long-term storage—neither of which are considered practical for this site—are not required.

Treatment storage is not required as interception storage is incorporated within the SuDS strategy, capturing and treating runoff from frequent rainfall events at source. This provides an appropriate level of water quality treatment in accordance with SuDS principles, and, given

the site constraints, the provision of additional treatment storage would not be practical or necessary.

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All SuDS measures will be designed in accordance with the recommendation set out in the EPA document '*Guidance on Authorisation of Discharges to Groundwater 2011*'.

SuDS measures proposed are a combination of water butts, (not reflected on the SuDS layout), tree pits, rain gardens, permeable paving (in-curtilage parking only) and drainage kerbs with infiltration trenches. These measures would seek to achieve interception storage as a minimum. Attenuation storage capacity has been calculated and provided as though no interception storage were provided. Thereby is mitigated any seasonal performance of interception storage measures.

SuDS objectives relate to:

1. **Water Quality** – managing runoff rates and volumes to reduce flood risk
2. **Water Quantity** – improving the quality of runoff through treatment and pollution control
3. **Amenity** – enhancing the visual and recreational value of the site
4. **Biodiversity** – promoting habitat creation and ecological diversity

3.2.1 Water Quality

Water quality will be managed through the provision of petrol interceptors in combination with nature-based SuDS measures. Drainage kerbs directing runoff to infiltration trenches, swales, or rain gardens will facilitate the interception and treatment of hydrocarbons within adjacent green corridors, where appropriate. Hydrocarbon-tolerant planting species will be incorporated within SuDS features located alongside roadways to enhance treatment performance in areas requiring water quality management.

3.2.2 Water Quantity

Water quantity will be managed through the extensive use of SuDS measures, as outlined above, in combination with supplementary attenuation structures across the development. The drainage system will be designed to meet the required discharge thresholds under normal and exceedance conditions, including localised SuDS exceedance or seasonal reductions in infiltration capacity. This approach ensures that runoff is effectively controlled within the site and that greenfield runoff rates are maintained.

3.2.3 Amenity

A number of SuDS measures, including proposed rain gardens and tree pits identified within the landscape plan, will contribute to meeting this requirement. There is also scope for the incorporation of additional small-scale SuDS features during the detailed design stage to further enhance public amenity, which will be explored as part of the ongoing landscape design.

3.2.4 Biodiversity

The landscape design will be further developed at the detailed design stage to incorporate additional SuDS measures that maximise opportunities for biodiversity enhancement. Nevertheless, the SuDS measures currently proposed are aligned with, and will support, the landscape strategy in achieving the development's biodiversity objectives.

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3.3 Soakaway/Attenuation Design

The attenuation units are designed to function as 'offline' storage for surface water during extreme storm events, particularly when the network may surcharge. These storage areas will be constructed using cellular units in locations with spatial constraints and therefore require higher void ratios. Storage requirements have been calculated using Causeway Flow. Infiltration testing has been undertaken across the site and, where infiltration capacity has been confirmed, it will be incorporated into the relevant storage areas to help reduce their footprint. Infiltration will not be relied upon universally but will be applied selectively where ground conditions permit.

The proposed cellular units will be constructed providing a minimum 95% porosity. They will be constructed on a clean stone base which will provide additional capacity. This additional capacity has not been considered in the design of the units. Any proposed stone attenuation beds will provide a minimum of 43% porosity and will be wrapped in a permeable or impermeable geotextile membrane, as is appropriate to their location.

Hydrobrake manholes are provided at strategic locations to control surface water flows, allowing soakaway and attenuation features to fill to their design capacity while reducing unnecessary loading on the downstream drainage network.

All storage areas will be sized to attenuate the water generated for the largest storage required over a 48-hour storm period with rainfall depths taken for the 100-year return period + 20% for climate change for sliding durations obtained from Met Eireann.

Outputs, including the storage area information, from Causeway Flow modelling software form part of the appendices of this report as mentioned previously. The proposed storage locations are shown in the engineering drainage and SuDS layout drawings.

3.4 Oil/Petrol Interceptors

It is proposed to install separators prior to the outfall to the existing surface water network and immediately downstream of any hydrobrake manholes. The surface water will include run-off from the roadways and parking areas therefore may contain hydrocarbons. The installation of the separators will allow for the removal of these pollutants and prevent them for being discharged to the environment. The locations of the separators are shown graphically on the engineering drainage and SuDS layout drawings.

An example of a Separator Product Brochure is presented in **Appendix D**. The separators are selected by capacity based of the catchment area for which they are catering. These separators will also trap sand and silt in surface water runoff prior to outfall allowing for easy removal of the debris. Debris build-up can cause reduction in the available void space and storage capacity of an attenuation unit. Therefore, a regular maintenance regime is necessary to maintain the efficiency of these separators.

3.5 Surface Water Maintenance

To ensure the long-term effectiveness of the surface water management strategy, all drainage infrastructure—including road gullies, silt traps, flow control devices, and attenuation systems—shall be subject to a routine inspection and maintenance programme. This programme will be

carried out in accordance with the manufacturer's specifications and industry best practices. Regular maintenance will help prevent blockages, ensure optimal hydraulic performance, and reduce the risk of localised flooding. Records of inspections and maintenance activities should be kept and reviewed periodically to inform future asset management and ensure compliance with planning and environmental requirements.

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4. WATERMAIN NETWORK DESIGN

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The proposed watermain layout is presented in the engineering watermain layout drawings. The watermain layout has been designed in accordance with Uisce Eireann Code of Practice for Watermain Infrastructure IW-CDS-5020-03.

Hydrants, sluice valves, air valves and washout hydrants have been positioned within the site as shown on the layout drawings. All watermains are to be commissioned and pressure tested to Uisce Eireann standards on grant of planning and following receipt of a connection agreement. The typical construction details and the meter details are outlined in the engineering standard watermain details drawing.

4.1 GENERAL WATERMAIN LAYOUT

It is proposed to connect the watermain for the development off the watermain to be constructed as part of the permitted works which form part of the overall masterplan for the area. This watermain is a 150mm watermain permitted by Galway City Council (Planning Reference 24/60370), which in turn connects to an Uisce Eireann owned 150mm watermain that runs along the western boundary along the southern arm junction of the adjacent Western Distributor Road roundabout and Altan Road.

An arterial 150mm main will be brought into the development and a 100mm watermain will branch off this arterial watermain to service the housing blocks and cul-de-sacs. The watermain for the development will also tie into the proposed residential development, located east of this site, which is currently under review by Galway City Council for planning having been submitted as a separate application (LRD 02/26 Kingston Stables - Phase 2).

In accordance with Local authority/Uisce Eireann standards, a water meter and Logging Device (Larson Type) are proposed at the entrance of the connection into the proposed site. A sluice valve, strainer and 150mm diameter by-pass arrangement are also proposed to allow for possible disconnection of water meters by the Local Authority/ Uisce Eireann.

4.2 FIRE FIGHTING FLOWS

To meet required fire flow requirements, it is proposed to install a static storage capacity within the site. This is being provided as Uisce Eireann will not guarantee available fire flow within the hydrants located on site. It is proposed to provide an underground storage tank capable of supplying a minimum of 8l/s of flow for a 1-hour period. This equates to a minimum volume required for the site of 28,800 litres (28m^3 of storage).

The flow range of 8l/s is derived from the 'National Guidance Document on the provisions of water for Firefighting – Water UK 3rd Edition'. The tank shall be located within a grassed area and easily accessible by fire tenders and tankers should they need access. A top up supply from the proposed watermain network will be provided.

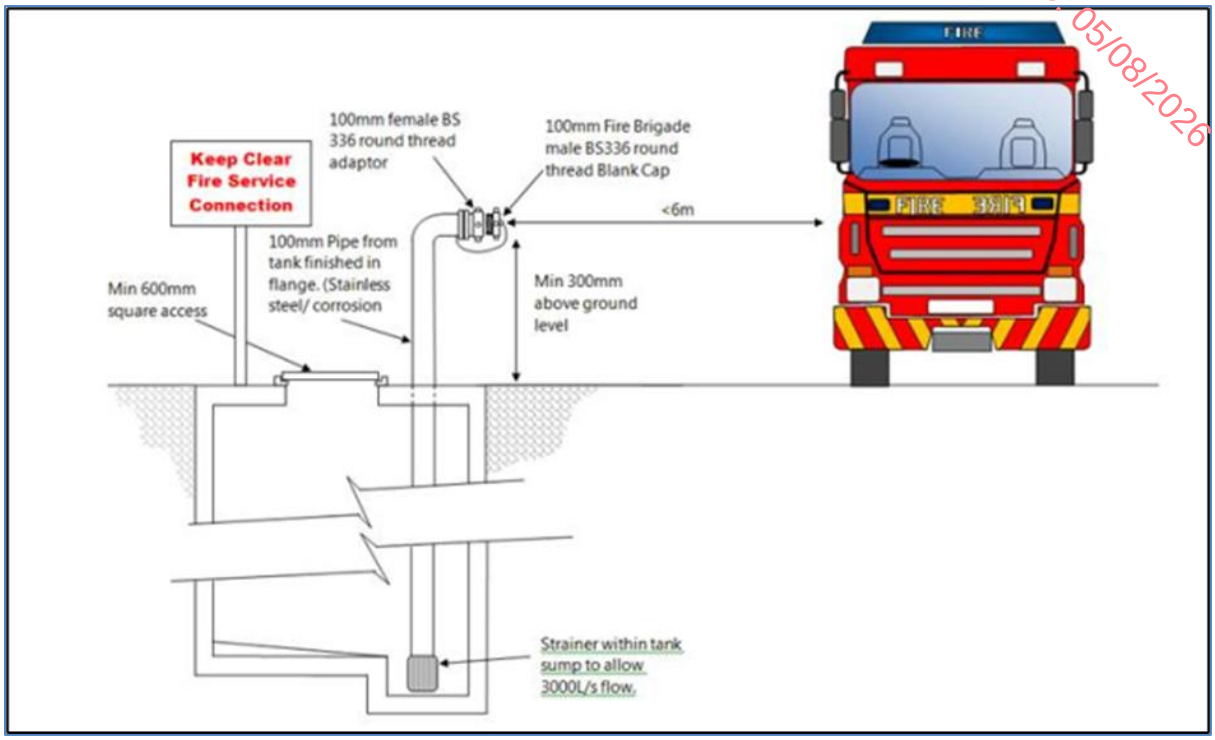
It is noted that in addition to the static storage tank, a significant volume of water will still be available from hydrants located throughout the development. Any specific requirements as requested by the local fire authority will be incorporated at the detail design stage.

The above is subject to Uisce Eireann network performance testing. Should Uisce Eireann confirm that 8l/s can be achieved within the network then the above tank maybe omitted at the

discretion of the local Fire Dept allowing the development to be serviced by the hydrants solely. Any such omissions will be agreed with the Fire Officer of at construction stage.

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Figure 2 Typical detail of a below ground static storage tank for firefighting.



5. ROADS LAYOUT

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All internal roads will be designed in accordance with the Design Manual for Urban Roads and Streets (DMURS), May 2019 and the Recommendations for Site Development Works for Housing Areas, 1998. Auto track vehicle swept path analysis have been completed for the proposed site layout for a Large Car, a Refuse Truck, and a Fire Tender to ensure the vehicles can safely manoeuvre around the site. The swept paths are shown on the engineering Auto tracking drawings that accompany this report as separate documents.

Vehicular access is proposed from an existing roundabout on the Western Distributor Road, off the southern arm junction. Due to the large scale of the Masterplan development, upgrade works to the southern arm junction have been permitted by Galway City Council (Planning Reference 24/60370). Currently the junction services Altan, an existing residential development, and Knocknacarra National School. The permitted road layout, (Planning Reference 24/60370), amends the alignment of this road to have the access to the proposed development as the major road, with the school access being the minor road. Discussions have been held with Galway City Council to include arrangements to tie in with the Active Travel Scheme proposed for the area.

Discussions have been held with Galway City Council regarding the proposed southern arm junction upgrade works and to include arrangements to tie in with the Active Travel Scheme proposed for the area. There are additional pedestrian and cyclist linkages proposed around the development which encourages permeability and promotes sustainable modes of transport.

Additional pedestrian and cyclist connections are proposed throughout the development to enhance permeability and promote sustainable modes of transport. Notably, Millers Lane will be extended at the northeast corner of the site, as per the permitted road layout, (Planning Reference 24/60370), introducing a 4-metre-wide shared pedestrian and cycleway. This route will traverse from Millers Lane southwards and tie into the proposed segregated pedestrian footpath and cycle lanes, ensuring connectivity to all key areas.

The proposed maximum speed limit within the development is to be 30km/h, with appropriate traffic control measures where required. Road widths within the development are generally 5.5m wide and 4.8m wide where 'Homezone' areas are proposed. Footpaths are 2m wide in general and are delineated where they are needed in the 'Homezone' areas. Pedestrian paths will be provided throughout the site adjacent to the roads, behind parking where feasible and throughout the green open spaces.

Road levels for the site have been derived taking cognisance of the existing topography and ground conditions. Road build-up shall be in accordance with Galway City Council Taking In-Charge requirements and as per the engineering Typical Site Works Details drawing. The use of raised junctions/crossings and pedestrian crossing points along with strategically positioned drop kerbs and tactile paving will allow for full linkage for visually impaired and less-able pedestrians. Refer to the DMURS 2019 Statement of Consistency report, which accompanies this document, for further details on the road's layout. The 'Homezone' areas, shall be finished in a distinct surface material to differentiate them from vehicle priority roads. Roads will include a 1:40 camber from the centre of the road or a 1:40 crossfall from one side to the other and longitudinal gradients of road sections lie between 1:21 and 1:200 to ensure adequate surface water drainage is achieved.

Lockable gullies are to be located, at a minimum, every 200m^2 with local low points allowing for double gullies as per Recommendations for Site Development Works for Housing Areas to ensure surface water drainage will not be blocked.

A Traffic and Transport Assessment, (TTA), has also been conducted on the proposed development and accompanies this report as a separate document. An independent Road Safety Audit will be carried out on the site and the Auditor's report will be included in the final stage of the planning submission for this proposed development as a separate document. The Auditor's report is included as an appendix of the TTA Report. The items raised by the Road Safety Audit have been addressed in detail within a section of the TTA.

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6. RETAINING AND SUBSURFACE STRUCTURES

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Proposed road and finished floor levels have been designed to keep any retaining structures at an absolute minimum, whether they are retaining the proposed development or the neighbouring ground. However, due to the large scale of the development and constraints such as road-tie in points, allowable road gradients and surrounding sites, some retaining is required. All required retained heights have been kept to a minimum.

The construction of subsurface structures such as attenuation tanks and structural elements such as building foundations are necessary for the proposed development. It is envisaged that buildings will be founded upon either raft or strip foundations. The possibility of piling also remains. The type of foundation to be employed will be confirmed through detailed design considering the ground conditions.

All structures will be required to be founded upon firm subgrade or bedrock to be confirmed by onsite testing prior to the construction of any structure or foundation.

7. CONCLUSION

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The report should be read in conjunction with the associated drawings, layouts, and specifications. We trust that adequate detail has been provided for the wastewater drainage layout and the surface water drainage layout, watermain design layout, SuDS design layout and road layouts. Should any further detail be required, we will be happy to meet and supply same, as may be deemed appropriate.

8. REFERENCES

RECEIVED: 05/08/2026

Uisce Éireann Code of Practice for Wastewater Infrastructure IW-CDS-5030-03, Revision 3, August 2025

Uisce Éireann Code of Practice for Water Infrastructure IW-CDS-5020-03, Revision 3, August 2025

Design Manual for Urban Roads and Streets, Department of Transport, Tourism and Sport / Department of Housing, Planning and Local Government

National Guidance Document on the Provision of Water for Fire Fighting, 3rd Edition, January 2007, Local Government Association / Water UK

Recommendations for Site Development Works for Housing Areas, October 1998, Government of Ireland

Public Health and Plumbing Engineering CIBSE Guide G: 2014, Chartered Institute of Building Services Engineers

Traffic Signs Manual, August 2019, Department of Transport, Tourism and Sport

The SuDS Manual C753, 2015, CIRIA

BRE Digest 365, Building Research Establishment

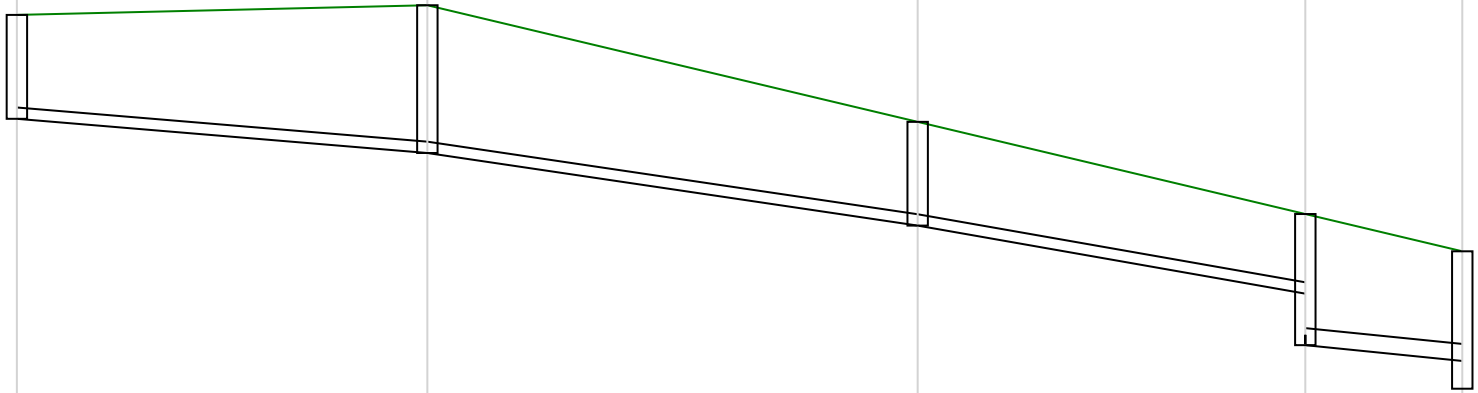
HR Wallingford, www.uksuds.com

Galway City Development Plan 2023–2029, Galway City Council, adopted 13 June 2023. Available at: www.galwaycity.ie/development-plan

Appendix A Foul Network Design

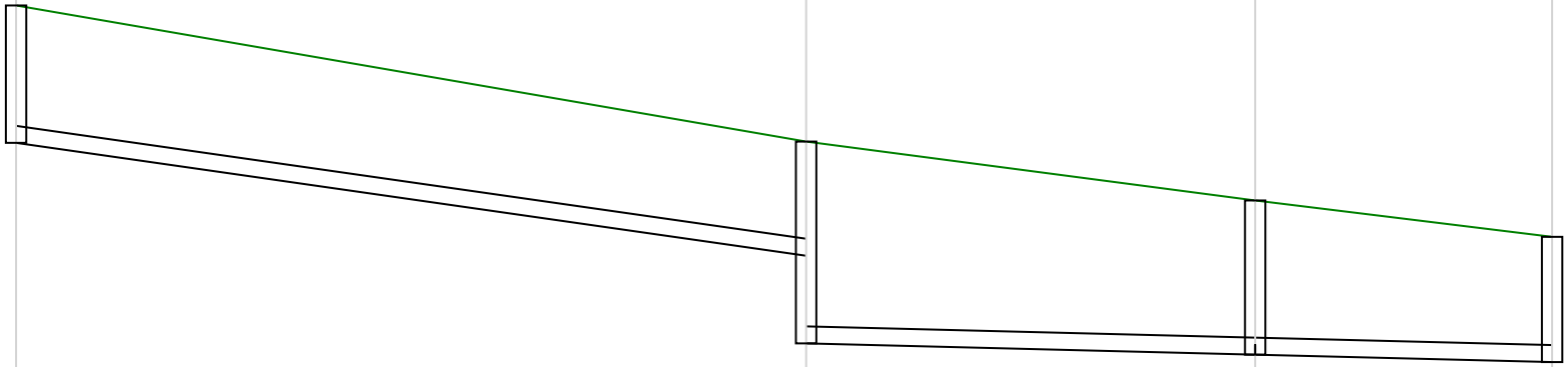
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Node Name	MQF 1	MQF 2	MQF 3	MQF 4	MQF 5
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 24.000					
Link Name	1.000	1.001	1.002	1.003	
Section Type	150mm	150mm	150mm	225mm	
Slope (1:X)	60.0	33.8	28.5	49.7	
Cover Level (m)	32.036	32.164	30.622	29.403	28.910
Invert Level (m)	30.662	30.210 / 30.210	29.250 / 29.250	28.350 / 27.669	27.460
Length (m)	27.139	32.418	25.631	10.378	

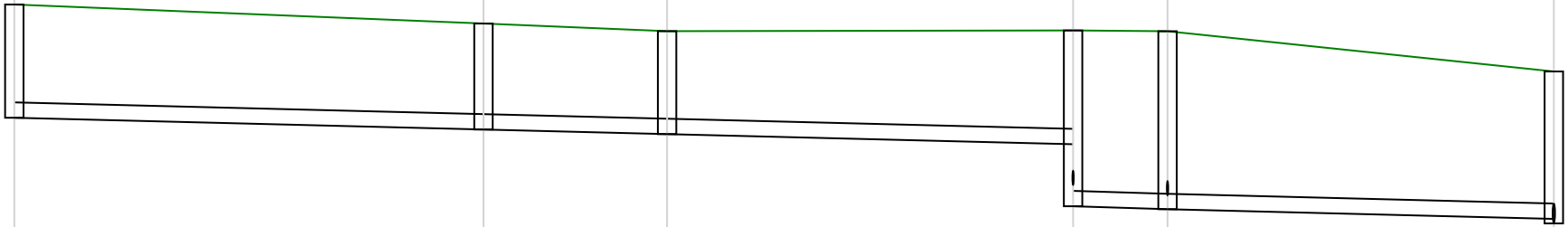
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A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 21.000				
Link Name	1.004	1.005	1.006	
Section Type	225mm	225mm	225mm	
Slope (1:X)	35.0	199.4	200.4	
Cover Level (m)	28.910	27.110	26.331	25.850
Invert Level (m)	27.093	25.600 / 24.441	24.292 / 24.292	24.194
Length (m)	52.271	29.709	19.644	

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Node Name	MQF 9		MQF 10		MQF 11		MQF 12	MQF 13		MQF 18
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000										
Link Name	1.007		1.008		1.009		1.010	1.011		
Section Type	225mm		225mm		225mm		225mm	225mm		
Slope (1:X)	199.6		200.5		200.7		160.7	199.0		
Cover Level (m)	25.850		25.572		25.460		25.471	25.459		24.871
Invert Level (m)	24.194	24.022	24.022	23.955	23.955	23.807	22.900	22.857	22.857	22.715
Length (m)	34.323		13.433		29.702		6.911	28.261		

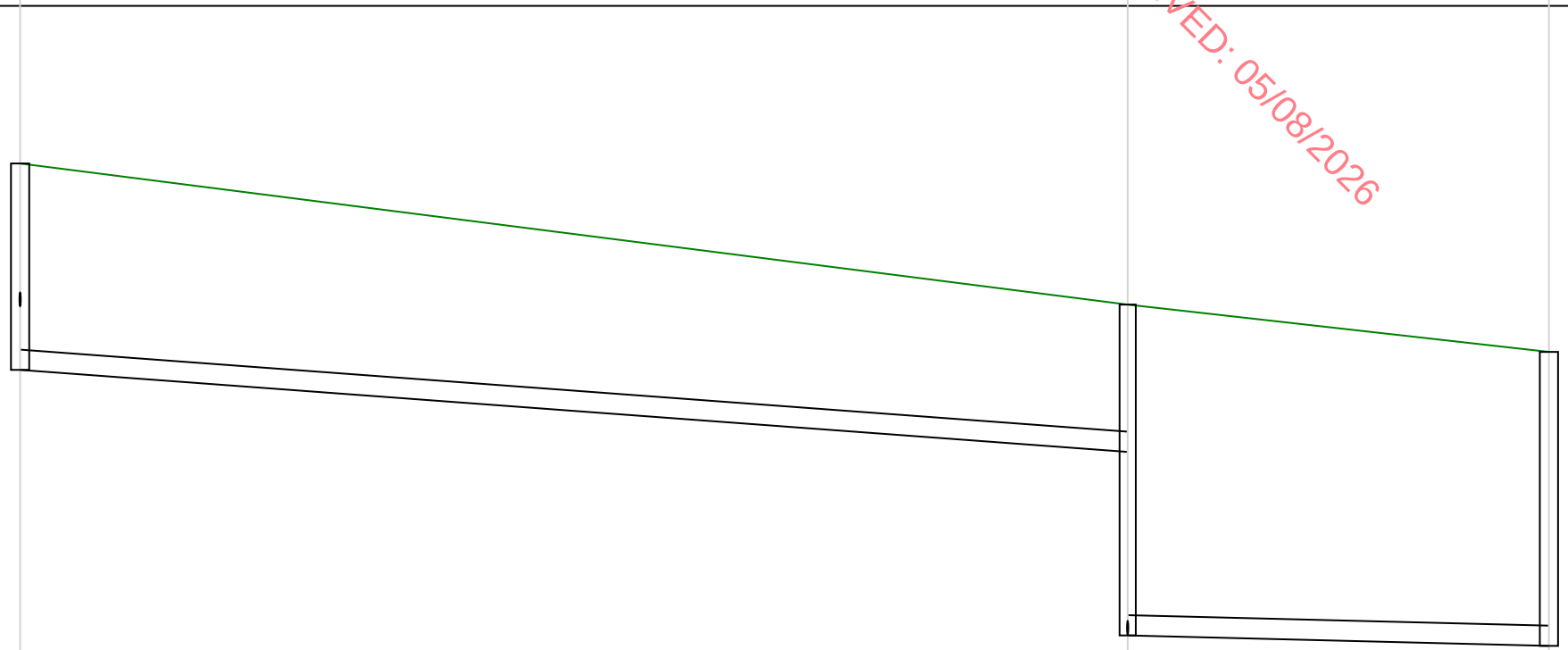
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Node Name	MQF 18	MQF 19	MQF 23	FR 1	FR 2
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000					
Link Name	1.012	1.013	1.014	1.015	
Section Type	300mm	300mm	300mm	300mm	
Slope (1:X)	162.7	199.3	199.3	200.8	
Cover Level (m)	24.871	25.029	25.003	24.995	25.171
Invert Level (m)	22.649	22.454 / 22.454	22.245 / 22.245	22.211 / 22.211	22.114
Length (m)	31.723	41.659	6.775	19.481	

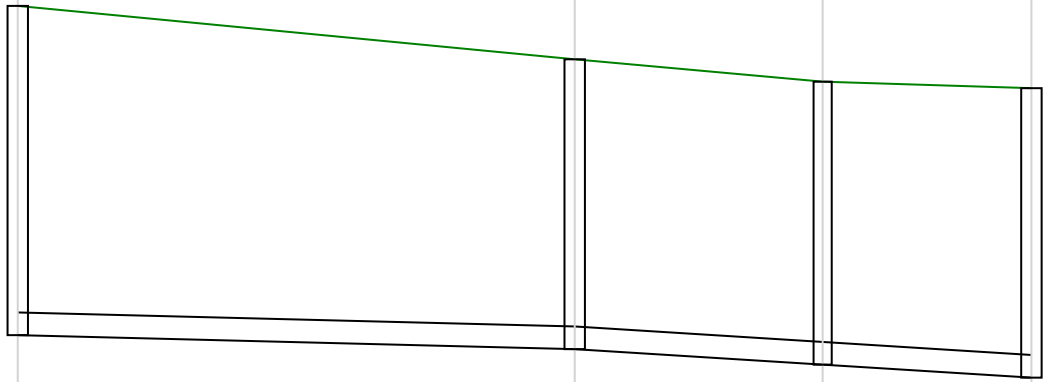
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A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 16.000			
Link Name	1.016		1.017
Section Type	300mm		300mm
Slope (1:X)	67.5		201.2
Cover Level (m)	25.171	23.081	22.380
Invert Level (m)	22.114	20.899 18.181	18.026
Length (m)	82.010		31.193

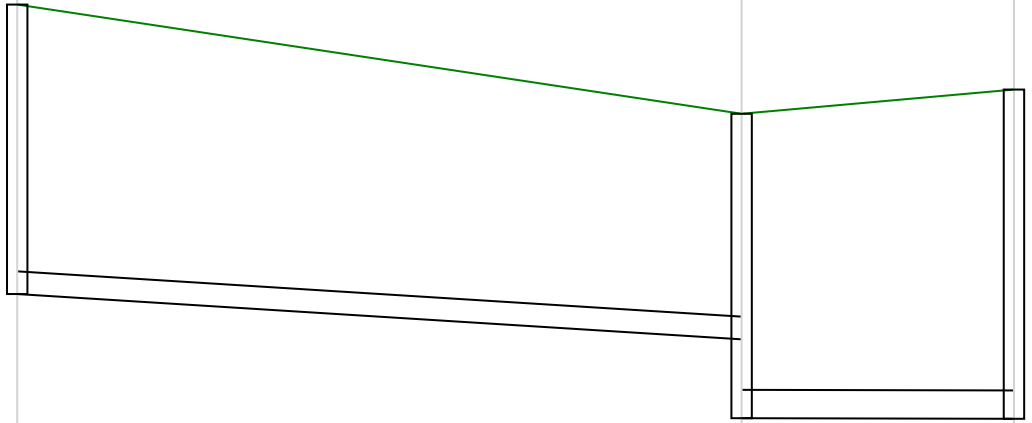
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Node Name	FR 4	FR 5	FR 6	FR 7
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 14.000				
Link Name	1.018	1.019	1.020	
Section Type	300mm	300mm	300mm	
Slope (1:X)	199.0	80.0	80.3	
Cover Level (m)	22.380	21.674	21.378	21.292
Invert Level (m)	18.026 / 17.841	17.841 / 17.636	17.636 / 17.464	
Length (m)	36.824	16.394	13.803	

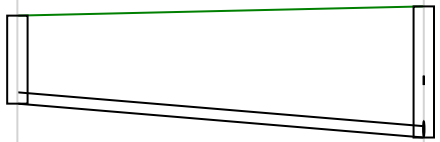
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Node Name	FR 7	FR 8	Ex.F 7
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 13.000			
Link Name	1.021	1.022	
Section Type	300mm	375mm	
Slope (1:X)	80.0	2250.9	
Cover Level (m)	21.292	19.848	20.168
Invert Level (m)	17.464	16.865 15.822	15.814
Length (m)	47.895	18.007	

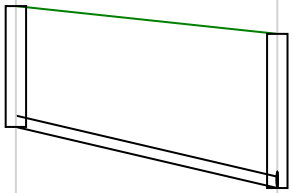
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Node Name		MQF 4.1	MQF 4
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 23.000			
Link Name		2.000	
Section Type		150mm	
Slope (1:X)		60.0	
Cover Level (m)		29.281	29.403
Invert Level (m)		28.117	27.669
Length (m)		26.870	

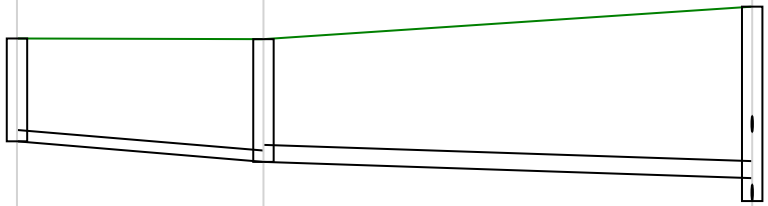
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Node Name		MQF 8.1	MQF 8
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 20.000			
Link Name		3.000	
Section Type		150mm	
Slope (1:X)		21.4	
Cover Level (m)		26.698	26.331
Invert Level (m)		25.100	24.292
Length (m)		17.285	

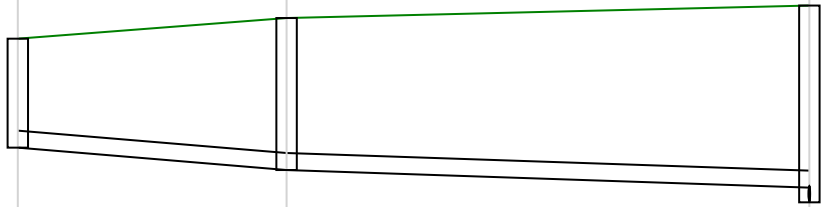
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Node Name		MQF 12.2	MQF 12.1	MQF J2
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000				
Link Name		4.000	4.001	
Section Type		150mm	225mm	
Slope (1:X)		59.9	150.3	
Cover Level (m)		25.050	25.041	25.471
Invert Level (m)		23.690 / 23.418	23.418	23.203
Length (m)		16.297	32.314	

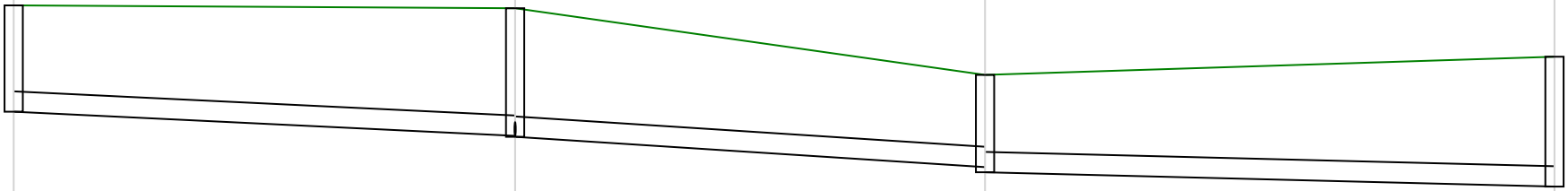
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Node Name		MQF 13.2	MQF 13.1	MQF 13
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000				
Link Name		5.000	5.001	
Section Type		225mm	225mm	
Slope (1:X)		60.0	148.3	
Cover Level (m)		25.021	25.294	25.459
Invert Level (m)		23.580 / 23.284	23.284 / 23.051	
Length (m)		17.771	34.565	

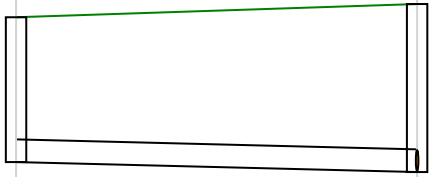
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Node Name	PF 1	MQF 15	MQF 16	MQF 17
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000				
Link Name	6.000	6.001	6.002	
Section Type	300mm	300mm	300mm	
Slope (1:X)	104.1	77.7	199.5	
Cover Level (m)	25.453	25.411	24.428	24.696
Invert Level (m)	23.885	23.529 / 23.515	23.068 / 22.992	22.781
Length (m)	37.066	34.735	42.092	

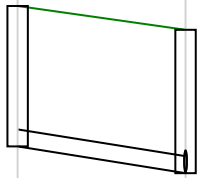
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Node Name		MQF 17	MQF 18
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000			
Link Name		6.003	
Section Type		300mm	
Slope (1:X)		200.9	
Cover Level (m)		24.696	24.871
Invert Level (m)		22.781	22.649
Length (m)		26.517	

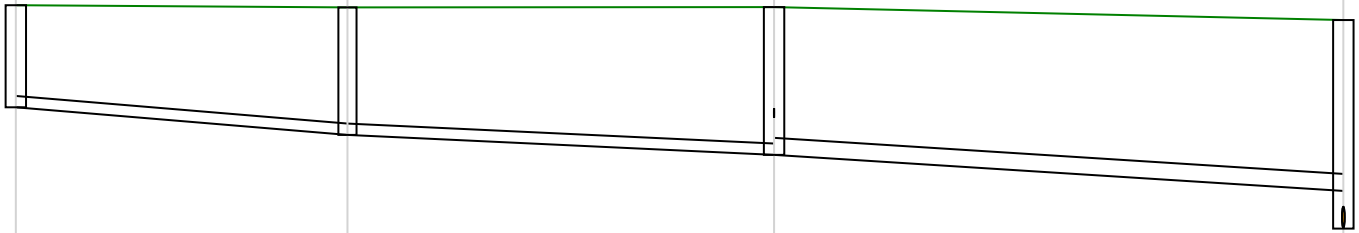
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Node Name		MQF 14	MQF 15
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 19.000			
Link Name		7.000	
Section Type		225mm	
Slope (1:X)		31.4	
Cover Level (m)		25.726	25.411
Invert Level (m)		23.869	23.515
Length (m)		11.102	

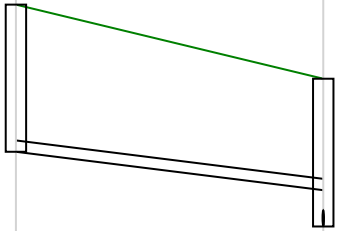
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Node Name	MQF 20	MQF 21	MQF 22	MQF 23
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000				
Link Name	8.000	8.001	8.002	
Section Type	150mm	150mm	225mm	
Slope (1:X)	60.1	106.8	78.9	
Cover Level (m)	25.199	25.170	25.174	25.003
Invert Level (m)	23.849	23.484 / 23.484	23.220 / 23.220	22.743
Length (m)	21.927	28.206	37.639	

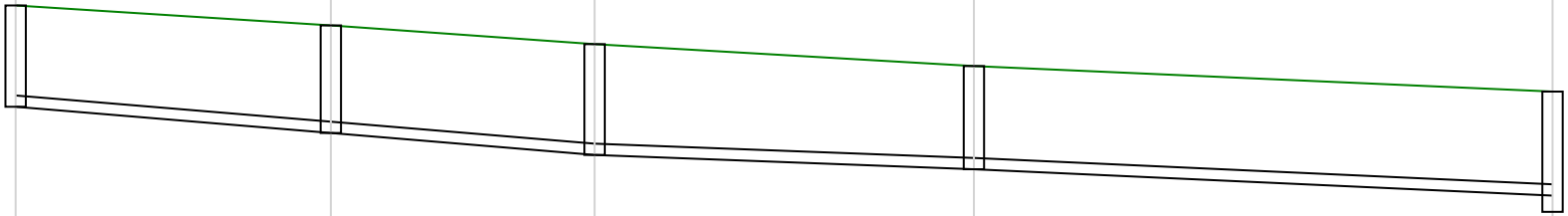
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Node Name		MQF 22.1	MQF 22
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 19.000			
Link Name		9.000	
Section Type		150mm	
Slope (1:X)		40.0	
Cover Level (m)		26.154	25.174
Invert Level (m)		24.208	23.700
Length (m)		20.320	

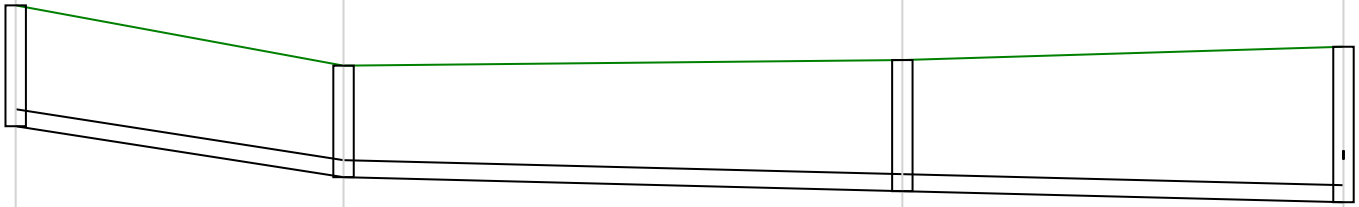
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Node Name	TF 1	TF 2	TF 3	TF 4	TF 5
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 20.000					
Link Name	10.000	10.001	10.002	10.003	
Section Type	150mm	150mm	150mm	150mm	
Slope (1:X)	60.1	59.9	132.4	109.7	
Cover Level (m)	27.526	27.261	27.012	26.721	26.382
Invert Level (m)	26.180	25.832 / 25.832	25.540 / 25.540	25.350 / 25.350	25.000
Length (m)	20.906	17.496	25.158	38.379	

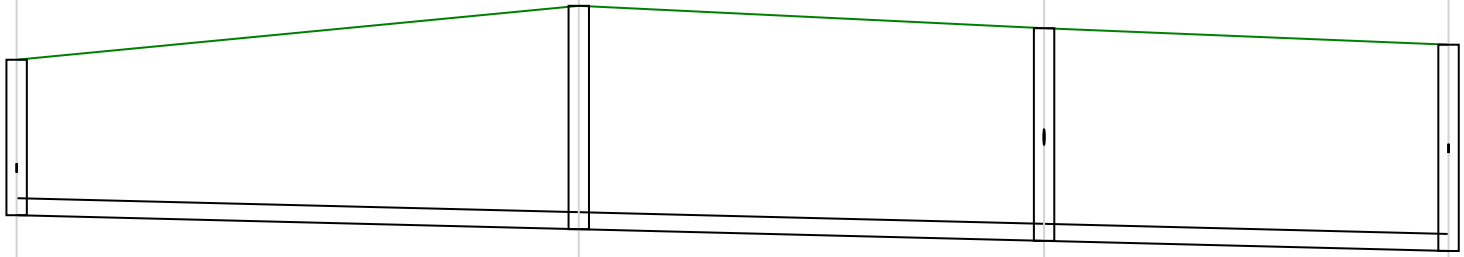
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Node Name	TF 5	TF 6	TF 7	TF 11
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 19.000				
Link Name	10.004	10.005	10.006	
Section Type	225mm	225mm	225mm	
Slope (1:X)	32.2	199.7	199.8	
Cover Level (m)	26.382	25.585	25.659	25.835
Invert Level (m)	24.784	24.110 / 24.110	23.925 / 23.925	23.779
Length (m)	21.676	36.947	29.167	

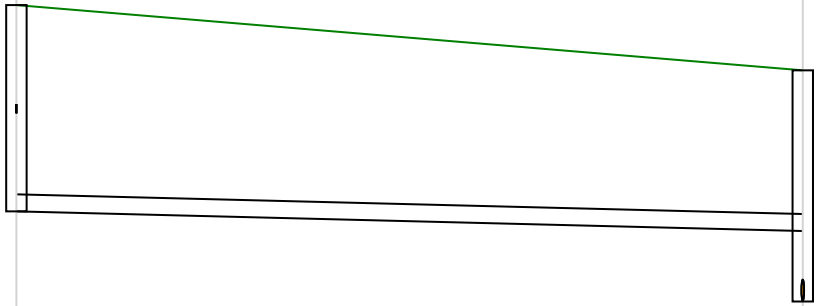
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Node Name	TF 11	TF 12	TF 27	AF 13
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 19.000				
Link Name	10.007	10.008	10.009	
Section Type	225mm	225mm	225mm	
Slope (1:X)	200.9	199.8	199.6	
Cover Level (m)	25.835	26.548	26.252	26.034
Invert Level (m)	23.779	23.594 / 23.594	23.440 / 23.440	23.306
Length (m)	37.167	30.766	26.742	

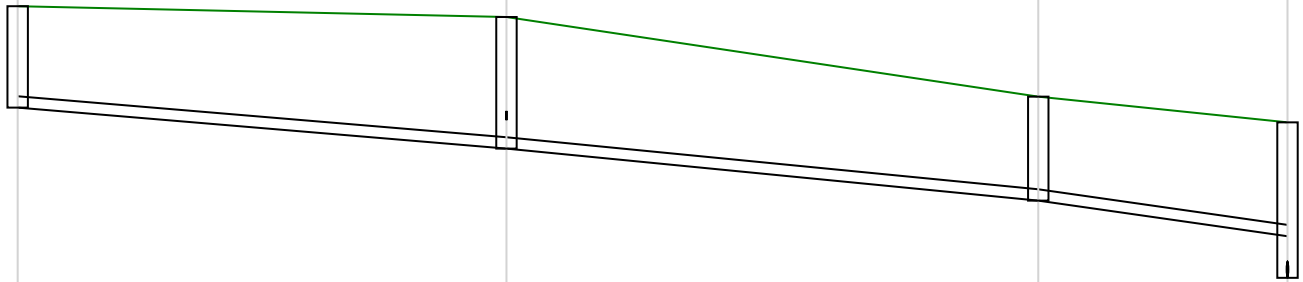
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Node Name	AF 13	FR 2
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 18.000		
Link Name	10.010	
Section Type	225mm	
Slope (1:X)	200.0	
Cover Level (m)	26.034	25.171
Invert Level (m)	23.306	23.046
Length (m)	51.992	

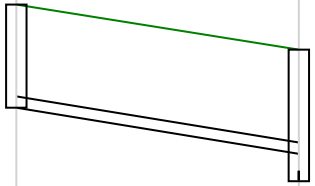
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Node Name	TF 9.1	TF 9	TF 10	TF 11
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 20.000				
Link Name	11.000	11.001	11.002	
Section Type	150mm	150mm	150mm	
Slope (1:X)	59.6	51.1	35.0	
Cover Level (m)	27.371	27.228	26.175	25.835
Invert Level (m)	26.030	25.488 / 25.488	24.800 / 24.800	24.329
Length (m)	32.318	35.162	16.478	

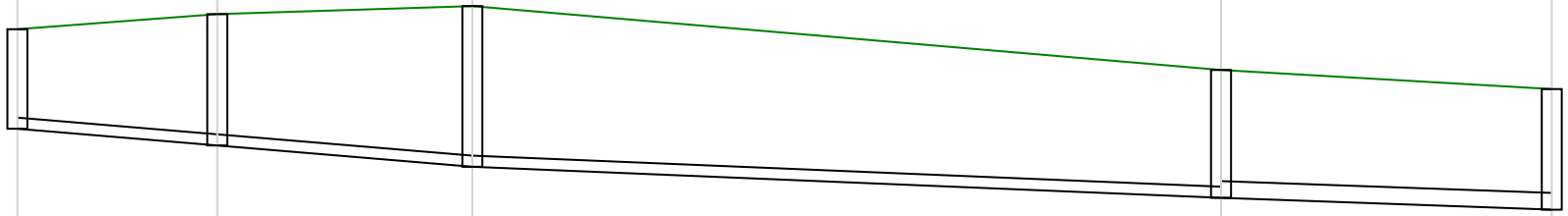
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Node Name		TF 8	TF 9
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 21.000			
Link Name		12.000	
Section Type		150mm	
Slope (1:X)		30.6	
Cover Level (m)		27.824	27.228
Invert Level (m)		26.460	25.850
Length (m)		18.680	

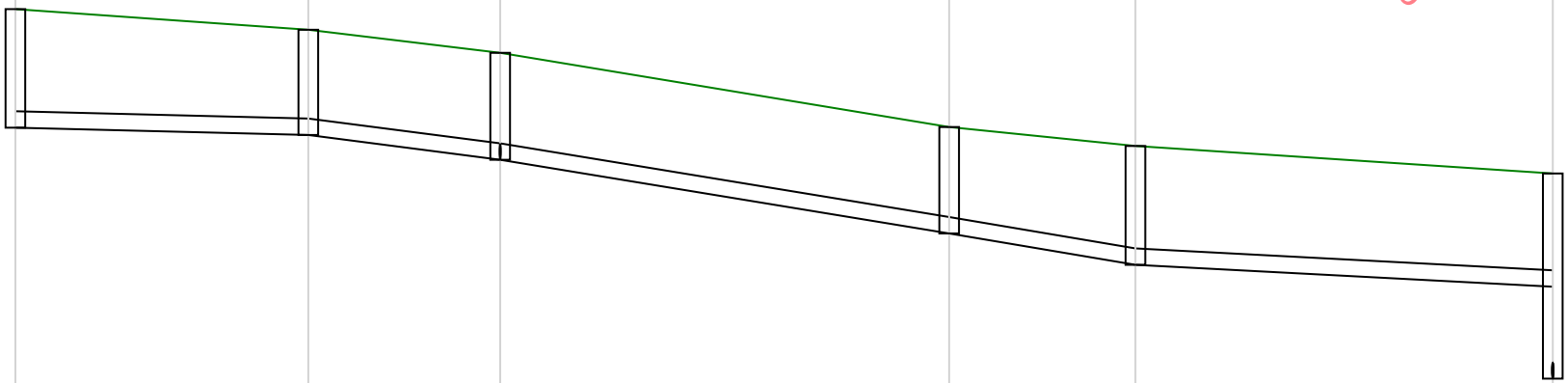
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Node Name	TF 13	TF 14	TF 15	TF 16	TF 17
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 22.000					
Link Name	13.000	13.001	13.002	13.003	
Section Type	150mm	150mm	150mm	225mm	
Slope (1:X)	59.9	60.0	120.8	140.3	
Cover Level (m)	29.311	29.514	29.622	28.762	28.505
Invert Level (m)	27.970	27.745 / 27.745	27.458 / 27.458	27.040 / 27.040	26.881
Length (m)	13.485	17.211	50.510	22.313	

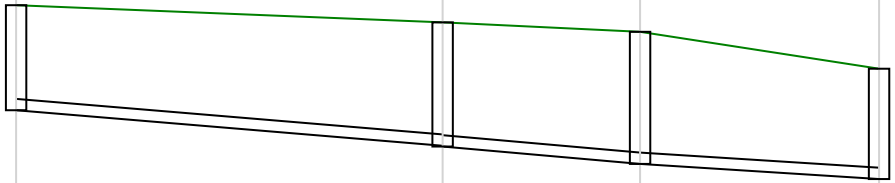
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Node Name	TF 17	TF 18	TF 24	TF 25	TF 26	TF 27
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 20.000						
Link Name	13.004	13.005	13.006	13.007	13.008	
Section Type	225mm	225mm	225mm	225mm	225mm	
Slope (1:X)	201.0	38.7	30.5	29.7	95.4	
Cover Level (m)	28.505	28.222	27.906	26.889	26.629	26.252
Invert Level (m)	26.880	26.780	26.780	26.440	26.440	25.430	25.430	25.000	25.000	24.700
Length (m)	20.096	13.163	30.803	12.779	28.632	

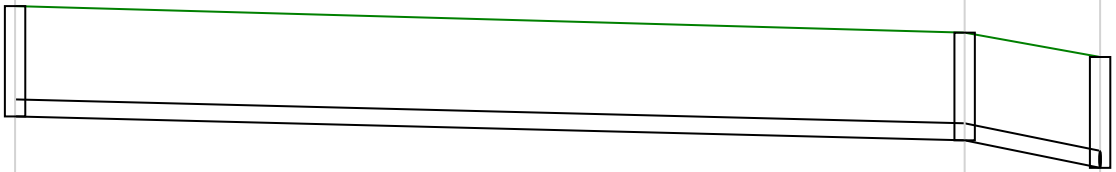
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Node Name	TF 19	TF 20	TF 21	TF 22
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 23.000				
Link Name	14.000	14.001	14.002	
Section Type	150mm	150mm	150mm	
Slope (1:X)	60.0	56.8	79.0	
Cover Level (m)	29.419	29.192	29.067	28.579
Invert Level (m)	28.030	27.560 / 27.550	27.320 / 27.320	27.120
Length (m)	28.200	13.055	15.802	

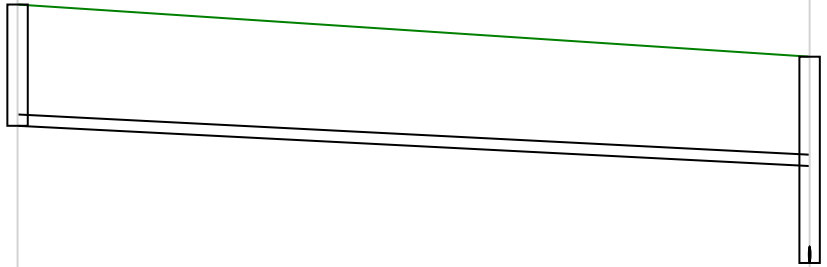
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Node Name	TF 22		TF 23	TF 24
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 22.000				
Link Name		14.003	14.004	
Section Type		225mm	225mm	
Slope (1:X)		198.7	24.6	
Cover Level (m)	28.579		28.228	27.906
Invert Level (m)	27.120		26.804 / 26.804	26.440
Length (m)		62.783	8.956	

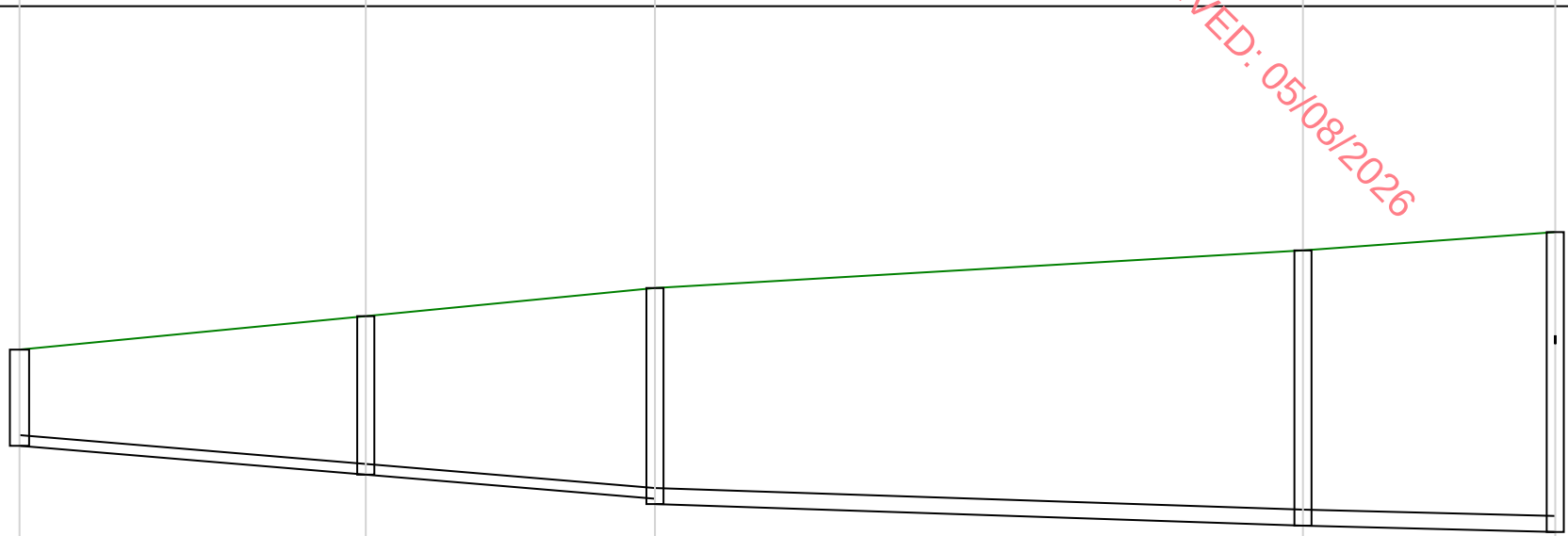
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Node Name	AF 12	AF 13
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 19.000		
Link Name	15.000	
Section Type	150mm	
Slope (1:X)	98.4	
Cover Level (m)	26.724	26.034
Invert Level (m)	25.120	24.588
Length (m)	52.369	

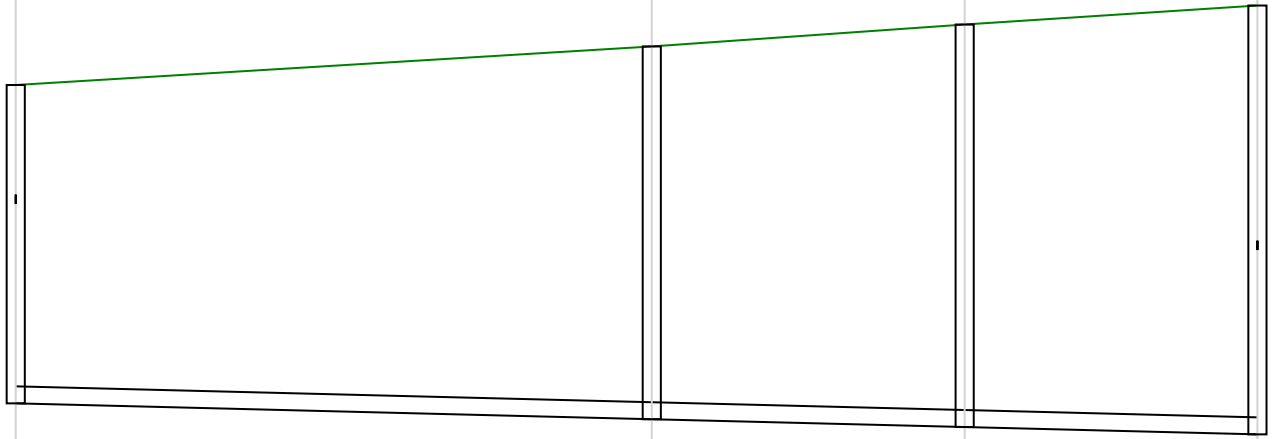
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Node Name	KF1	KF2	KF3	KF4	KF8
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 15.000					
Link Name	16.000	16.001	16.002	16.003	
Section Type	150mm	150mm	225mm	225mm	
Slope (1:X)	60.0	60.0	150.1	198.9	
Cover Level (m)	21.684	22.154	22.549	23.077	23.334
Invert Level (m)	20.334 / 19.929	19.929 / 19.591	19.516 / 19.213	19.213 / 19.124	
Length (m)	24.297	20.290	45.467	17.703	

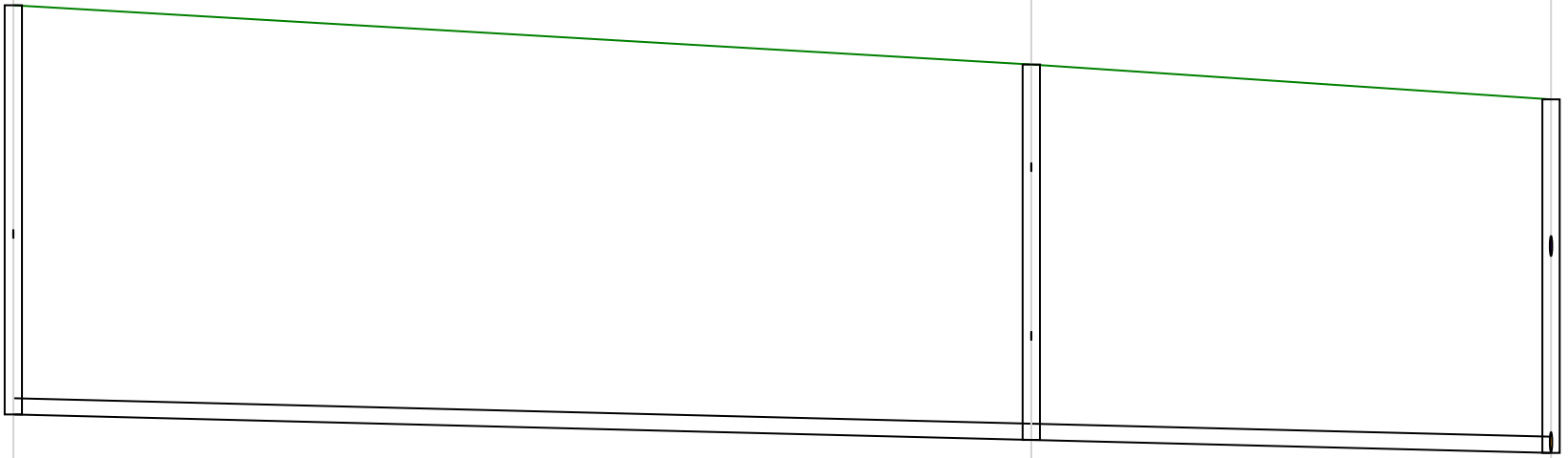
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Node Name	KF8	KF9	KF10	KF12
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 16.000				
Link Name	16.004	16.005	16.006	
Section Type	225mm	225mm	225mm	
Slope (1:X)	200.3	200.9	199.6	
Cover Level (m)	23.334	23.844	24.134	24.385
Invert Level (m)	19.124	18.914 / 18.914	18.811 / 18.811	18.714
Length (m)	42.053	20.688	19.357	

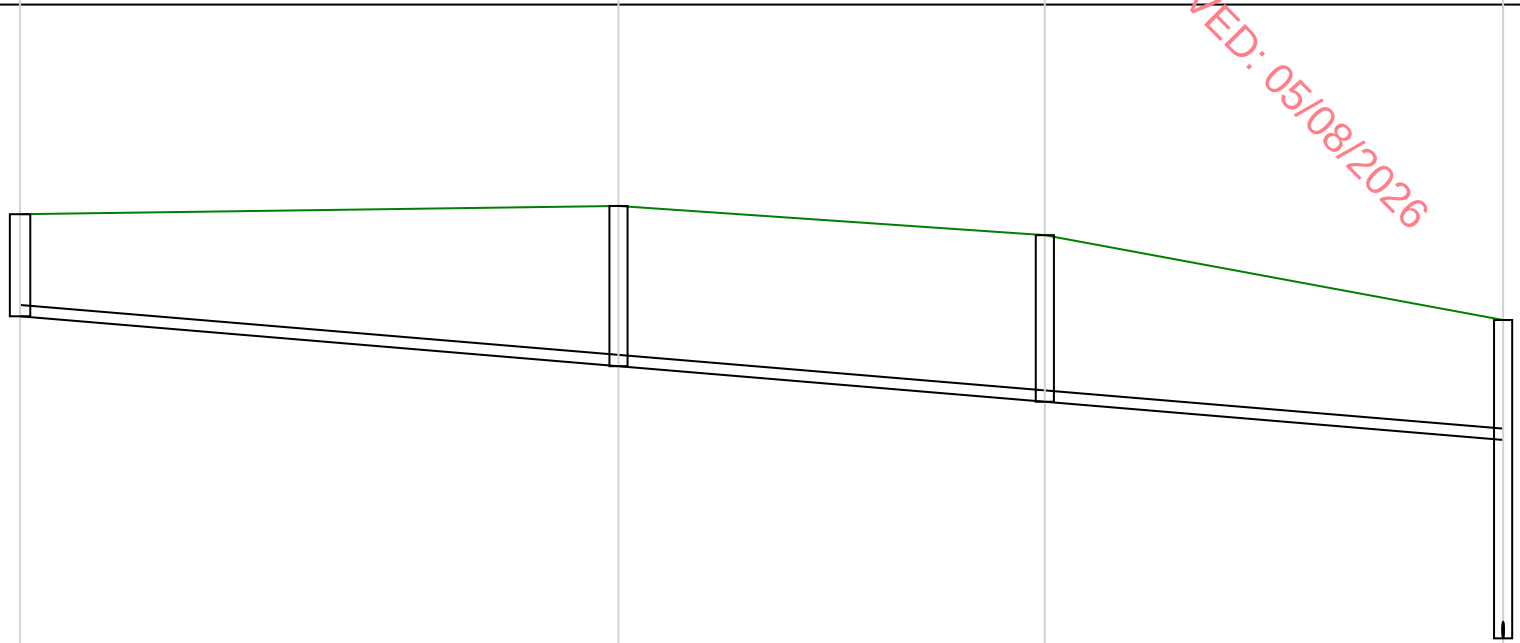
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Node Name	KF12	KF15	FR 3
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 16.000			
Link Name	16.007	16.008	
Section Type	225mm	225mm	
Slope (1:X)	200.0	200.3	
Cover Level (m)	24.385	23.564	23.081
Invert Level (m)	18.714	18.361 18.361	18.181
Length (m)	70.611	36.051	

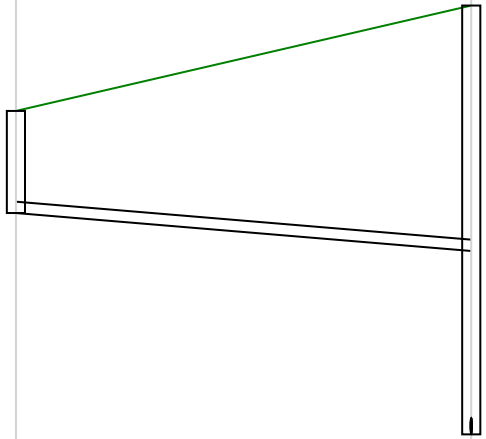
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Node Name	KF5	KF6	KF7	KF8
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 16.000				
Link Name	17.000	17.001	17.002	
Section Type	150mm	150mm	150mm	
Slope (1:X)	60.0	60.0	60.0	
Cover Level (m)	24.733	24.842	24.456	23.334
Invert Level (m)	23.383	22.723 / 22.723	22.253 / 22.253	21.748
Length (m)	39.568	28.188	30.300	

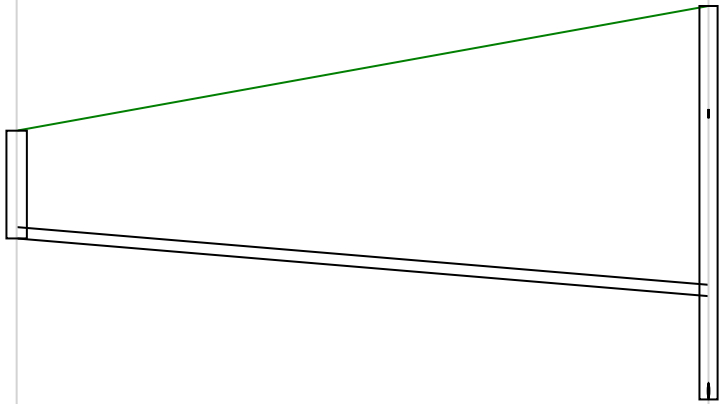
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Node Name	KF11	KF12
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 16.000		
Link Name	18.000	
Section Type	150mm	
Slope (1:X)	60.0	
Cover Level (m)	22.991	24.385
Invert Level (m)	21.641	21.139
Length (m)	30.105	

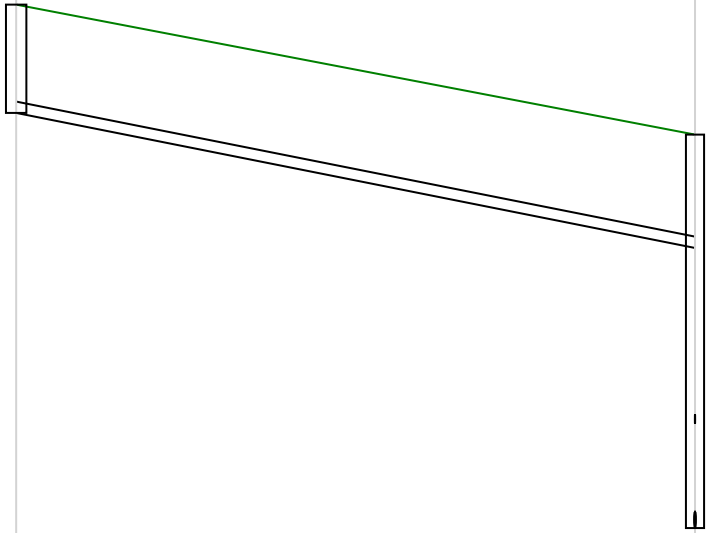
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Node Name	KF13	KF15
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 15.000		
Link Name	19.000	
Section Type	150mm	
Slope (1:X)	60.0	
Cover Level (m)	21.915	23.564
Invert Level (m)	20.490	19.727
Length (m)	45.745	

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Node Name	KF14	KF15
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 16.000		
Link Name	20.000	
Section Type	150mm	
Slope (1:X)	25.1	
Cover Level (m)	25.283	23.564
Invert Level (m)	23.851	22.065
Length (m)	44.884	

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Design Settings

Frequency of use (kDU)	0.50	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	450	Connection Type	Level Inverts
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.500
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	1.200
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Units	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
MQF 1	16.0	32.036	Adoptable	526938.359	724921.203	1.374
MQF 2		32.164	Adoptable	526930.300	724895.288	1.954
MQF 3	4.0	30.622	Adoptable	526899.285	724904.722	1.372
MQF 4.1	8.0	29.281	Adoptable	526882.671	724937.877	1.164
MQF 4		29.403	Adoptable	526874.768	724912.196	1.734
MQF 5	12.0	28.910	Adoptable	526864.393	724911.907	1.817
MQF 7	5.0	27.110	Adoptable	526825.334	724877.171	2.669
MQF 8.1	2.0	26.698	Adoptable	526815.876	724843.845	1.598
MQF 8		26.331	Adoptable	526804.046	724856.447	2.039
MQF 9		25.850	Adoptable	526793.326	724839.986	1.656
MQF 10		25.572	Adoptable	526778.314	724809.121	1.550
MQF 11		25.460	Adoptable	526772.316	724797.102	1.505
MQF 12.2	18.0	25.050	Adoptable	526747.053	724773.026	1.360
MQF 12.1	22.0	25.041	Adoptable	526732.124	724779.561	1.623
MQF 12		25.471	Adoptable	526745.158	724809.129	2.571
MQF 13.2	20.0	25.021	Adoptable	526769.768	724836.451	1.441
MQF 13.1	20.0	25.294	Adoptable	526753.504	724843.610	2.010
MQF 13	5.0	25.459	Adoptable	526738.988	724812.242	2.602
PF 1	80.0	25.453	Adoptable	526787.806	724905.442	1.568
MQF 14	5.0	25.726	Adoptable	526782.974	724866.719	1.857
MQF 15	15.0	25.411	Adoptable	526772.947	724871.485	1.896
MQF 16	15.0	24.428	Adoptable	526741.307	724885.820	1.436
MQF 17	5.0	24.696	Adoptable	526723.936	724847.480	1.915
MQF 18	10.0	24.871	Adoptable	526712.992	724823.327	2.222
MQF 19	20.0	25.029	Adoptable	526699.899	724794.432	2.575
MQF 20	5.0	25.199	Adoptable	526758.371	724753.103	1.350
MQF 21	5.0	25.170	Adoptable	526745.364	724735.451	1.686
MQF 22.1	4.0	26.154	Adoptable	526715.295	724721.052	1.946
MQF 22	10.0	25.174	Adoptable	526717.755	724741.222	1.954
MQF 23		25.003	Adoptable	526683.244	724756.246	2.758
FR 1	1.0	24.995	Adoptable	526677.847	724760.341	2.784
TF 1	5.0	27.526	Adoptable	526704.417	724603.093	1.346
TF 2	4.0	27.261	Adoptable	526708.077	724582.510	1.429
TF 3	6.0	27.012	Adoptable	526711.325	724565.318	1.472
TF 4	6.0	26.721	Adoptable	526687.114	724558.477	1.371
TF 5		26.382	Adoptable	526650.093	724548.359	1.598
TF 6	10.0	25.585	Adoptable	526628.798	724552.408	1.475
TF 7	6.0	25.659	Adoptable	526633.900	724589.000	1.734
TF 9.1	2.0	27.371	Adoptable	526686.583	724651.622	1.341
TF 8	3.0	27.824	Adoptable	526707.958	724621.075	1.364
TF 9	8.0	27.228	Adoptable	526689.352	724619.423	1.740
TF 10		26.175	Adoptable	526654.370	724615.859	1.375
TF 11	10.0	25.835	Adoptable	526638.017	724617.875	2.056
TF 12	8.0	26.548	Adoptable	526642.741	724654.741	2.954

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Nodes

Name	Units	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
TF 13	3.0	29.311	Adoptable	526796.036	724628.912	1.341
TF 14	6.0	29.514	Adoptable	526794.668	724642.327	1.769
TF 15	8.0	29.622	Adoptable	526787.059	724657.765	2.164
TF 16	4.0	28.762	Adoptable	526772.602	724706.162	1.722
TF 17	4.0	28.505	Adoptable	526750.499	724703.109	1.625
TF 18		28.222	Adoptable	526730.598	724700.316	1.442
TF 19	10.0	29.419	Adoptable	526785.454	724621.282	1.389
TF 20	1.0	29.192	Adoptable	526757.389	724618.525	1.642
TF 21	1.0	29.067	Adoptable	526744.396	724617.249	1.747
TF 22	18.0	28.579	Adoptable	526735.001	724629.955	1.459
TF 23		28.228	Adoptable	526728.981	724692.449	1.424
TF 24	3.0	27.906	Adoptable	526720.025	724692.475	1.466
TF 25	2.0	26.889	Adoptable	526689.692	724687.121	1.459
TF 26	1.0	26.629	Adoptable	526677.911	724682.169	1.629
TF 27	4.0	26.252	Adoptable	526649.398	724684.777	2.812
AF 12	14.0	26.724	Adoptable	526704.320	724705.527	1.604
AF 13	11.0	26.034	Adoptable	526652.278	724711.364	2.728
FR 2		25.171	Adoptable	526658.545	724762.977	3.057
KF1	5.0	21.684	Adoptable	526565.096	724487.223	1.350
KF2	4.0	22.154	Adoptable	526560.920	724511.158	2.225
KF3	11.0	22.549	Adoptable	526560.923	724531.448	3.033
KF4	3.0	23.077	Adoptable	526561.386	724576.913	3.864
KF5	7.0	24.733	Adoptable	526615.451	724551.994	1.350
KF6		24.842	Adoptable	526616.455	724591.549	2.119
KF7	10.0	24.456	Adoptable	526588.764	724596.817	2.203
KF8	8.0	23.334	Adoptable	526558.562	724594.389	4.210
KF9	5.0	23.844	Adoptable	526557.325	724636.424	4.930
KF10	3.0	24.134	Adoptable	526561.841	724656.613	5.323
KF11	5.0	22.991	Adoptable	526533.536	724678.458	1.350
KF12	2.0	24.385	Adoptable	526563.532	724675.896	5.671
KF13	12.0	21.915	Adoptable	526526.597	724755.990	1.425
KF14	12.0	25.283	Adoptable	526614.606	724734.450	1.432
KF15		23.564	Adoptable	526571.256	724746.083	5.203
FR 3		23.081	Adoptable	526578.624	724781.373	4.900
FR 4	8.0	22.380	Adoptable	526548.282	724788.609	4.354
FR 5		21.674	Adoptable	526513.065	724799.367	3.833
FR 6		21.378	Adoptable	526501.440	724810.927	3.742
FR 7		21.292	Adoptable	526490.875	724819.809	3.828
FR 8		19.848	Adoptable	526469.192	724862.515	4.026
Ex.F 7		20.168	Adoptable	526452.498	724855.767	4.354

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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)
1.000	MQF 1	MQF 2	27.139	1.500	30.662	30.210	0.452	60.0	150
1.001	MQF 2	MQF 3	32.418	1.500	30.210	29.250	0.960	33.8	150
1.002	MQF 3	MQF 4	25.631	1.500	29.250	28.350	0.900	28.5	150
2.000	MQF 4.1	MQF 4	26.870	1.500	28.117	27.669	0.448	60.0	150
1.003	MQF 4	MQF 5	10.378	1.500	27.669	27.460	0.209	49.7	225
1.004	MQF 5	MQF 7	52.271	1.500	27.093	25.600	1.493	35.0	225
1.005	MQF 7	MQF 8	29.709	1.500	24.441	24.292	0.149	199.4	225
3.000	MQF 8.1	MQF 8	17.285	1.500	25.100	24.292	0.808	21.4	150
1.006	MQF 8	MQF 9	19.644	1.500	24.292	24.194	0.098	200.4	225
1.007	MQF 9	MQF 10	34.323	1.500	24.194	24.022	0.172	199.6	225
1.008	MQF 10	MQF 11	13.433	1.500	24.022	23.955	0.067	200.5	225
1.009	MQF 11	MQF 12	29.702	1.500	23.955	23.807	0.148	200.7	225
4.000	MQF 12.2	MQF 12.1	16.297	1.500	23.690	23.418	0.272	59.9	150
4.001	MQF 12.1	MQF 12	32.314	1.500	23.418	23.203	0.215	150.3	225
1.010	MQF 12	MQF 13	6.911	1.500	22.900	22.857	0.043	160.7	225
5.000	MQF 13.2	MQF 13.1	17.771	1.500	23.580	23.284	0.296	60.0	225
5.001	MQF 13.1	MQF 13	34.565	1.500	23.284	23.051	0.233	148.3	225
1.011	MQF 13	MQF 18	28.261	1.500	22.857	22.715	0.142	199.0	225
6.000	PF 1	MQF 15	37.066	1.500	23.885	23.529	0.356	104.1	300
7.000	MQF 14	MQF 15	11.102	1.500	23.869	23.515	0.354	31.4	225
6.001	MQF 15	MQF 16	34.735	1.500	23.515	23.068	0.447	77.7	300
6.002	MQF 16	MQF 17	42.092	1.500	22.992	22.781	0.211	199.5	300
6.003	MQF 17	MQF 18	26.517	1.500	22.781	22.649	0.132	200.9	300
1.012	MQF 18	MQF 19	31.723	1.500	22.649	22.454	0.195	162.7	300

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.512	1.132	20.0	2.0	1.224	1.804	0.000	0	16.0	0.0	32	0.714
1.001	0.626	1.511	26.7	2.0	1.804	1.222	0.000	0	16.0	0.0	28	0.876
1.002	0.682	1.646	29.1	2.2	1.222	0.903	0.000	0	20.0	0.0	28	0.967
2.000	0.457	1.132	20.0	1.4	1.014	1.584	0.000	0	8.0	0.0	27	0.647
1.003	0.569	1.631	64.8	2.6	1.509	1.225	0.000	0	28.0	0.0	31	0.795
1.004	0.679	1.943	77.3	3.2	1.592	1.285	0.000	0	40.0	0.0	31	0.947
1.005	0.372	0.811	32.3	3.4	2.444	1.814	0.000	0	45.0	0.0	49	0.521
3.000	0.513	1.899	33.6	0.7	1.448	1.889	0.000	0	2.0	0.0	16	0.750
1.006	0.378	0.809	32.2	3.4	1.814	1.431	0.000	0	47.0	0.0	50	0.526
1.007	0.379	0.811	32.2	3.4	1.431	1.325	0.000	0	47.0	0.0	50	0.527
1.008	0.378	0.809	32.2	3.4	1.325	1.280	0.000	0	47.0	0.0	50	0.525
1.009	0.378	0.809	32.2	3.4	1.280	1.439	0.000	0	47.0	0.0	50	0.525
4.000	0.523	1.133	20.0	2.1	1.210	1.473	0.000	0	18.0	0.0	33	0.731
4.001	0.403	0.935	37.2	3.2	1.398	2.043	0.000	0	40.0	0.0	44	0.568
1.010	0.447	0.904	36.0	4.7	2.346	2.377	0.000	0	87.0	0.0	55	0.624
5.000	0.500	1.483	59.0	2.2	1.216	1.785	0.000	0	20.0	0.0	30	0.709
5.001	0.405	0.941	37.4	3.2	1.785	2.183	0.000	0	40.0	0.0	44	0.572
1.011	0.443	0.812	32.3	5.7	2.377	1.931	0.000	0	132.0	0.0	65	0.615
6.000	0.492	1.359	96.1	4.5	1.268	1.582	0.000	0	80.0	0.0	44	0.694
7.000	0.489	2.054	81.6	1.1	1.632	1.671	0.000	0	5.0	0.0	19	0.717
6.001	0.570	1.574	111.2	5.0	1.596	1.060	0.000	0	100.0	0.0	43	0.791
6.002	0.415	0.980	69.3	5.4	1.136	1.615	0.000	0	115.0	0.0	57	0.582
6.003	0.418	0.977	69.0	5.5	1.615	1.922	0.000	0	120.0	0.0	57	0.584
1.012	0.506	1.086	76.8	8.1	1.922	2.275	0.000	0	262.0	0.0	66	0.708

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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)
1.013	MQF 19	MQF 23	41.659	1.500	22.454	22.245	0.209	199.3	300
8.000	MQF 20	MQF 21	21.927	1.500	23.849	23.484	0.365	60.1	150
8.001	MQF 21	MQF 22	28.206	1.500	23.484	23.220	0.264	106.8	150
9.000	MQF 22.1	MQF 22	20.320	1.500	24.208	23.700	0.508	40.0	150
8.002	MQF 22	MQF 23	37.639	1.500	23.220	22.743	0.477	78.9	225
1.014	MQF 23	FR 1	6.775	1.500	22.245	22.211	0.034	199.3	300
1.015	FR 1	FR 2	19.481	1.500	22.211	22.114	0.097	200.8	300
10.000	TF 1	TF 2	20.906	1.500	26.180	25.832	0.348	60.1	150
10.001	TF 2	TF 3	17.496	1.500	25.832	25.540	0.292	59.9	150
10.002	TF 3	TF 4	25.158	1.500	25.540	25.350	0.190	132.4	150
10.003	TF 4	TF 5	38.379	1.500	25.350	25.000	0.350	109.7	150
10.004	TF 5	TF 6	21.676	1.500	24.784	24.110	0.674	32.2	225
10.005	TF 6	TF 7	36.947	1.500	24.110	23.925	0.185	199.7	225
10.006	TF 7	TF 11	29.167	1.500	23.925	23.779	0.146	199.8	225
11.000	TF 9.1	TF 9	32.318	1.500	26.030	25.488	0.542	59.6	150
12.000	TF 8	TF 9	18.680	1.500	26.460	25.850	0.610	30.6	150
11.001	TF 9	TF 10	35.162	1.500	25.488	24.800	0.688	51.1	150
11.002	TF 10	TF 11	16.478	1.500	24.800	24.329	0.471	35.0	150
10.007	TF 11	TF 12	37.167	1.500	23.779	23.594	0.185	200.9	225
10.008	TF 12	TF 27	30.766	1.500	23.594	23.440	0.154	199.8	225
13.000	TF 13	TF 14	13.485	1.500	27.970	27.745	0.225	59.9	150
13.001	TF 14	TF 15	17.211	1.500	27.745	27.458	0.287	60.0	150
13.002	TF 15	TF 16	50.510	1.500	27.458	27.040	0.418	120.8	150
13.003	TF 16	TF 17	22.313	1.500	27.040	26.881	0.159	140.3	225

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.013	0.479	0.981	69.3	8.4	2.275	2.458	0.000	0	282.0	0.0	71	0.665
8.000	0.422	1.131	20.0	1.1	1.200	1.536	0.000	0	5.0	0.0	24	0.601
8.001	0.390	0.847	15.0	1.6	1.536	1.804	0.000	0	10.0	0.0	33	0.546
9.000	0.473	1.388	24.5	1.0	1.796	1.324	0.000	0	4.0	0.0	21	0.666
8.002	0.465	1.293	51.4	2.4	1.729	2.035	0.000	0	24.0	0.0	34	0.663
1.014	0.483	0.981	69.3	8.7	2.458	2.484	0.000	0	306.0	0.0	72	0.672
1.015	0.481	0.977	69.1	8.8	2.484	2.757	0.000	0	307.0	0.0	72	0.672
10.000	0.422	1.131	20.0	1.1	1.196	1.279	0.000	0	5.0	0.0	24	0.601
10.001	0.469	1.133	20.0	1.5	1.279	1.322	0.000	0	9.0	0.0	28	0.656
10.002	0.384	0.760	13.4	1.9	1.322	1.221	0.000	0	15.0	0.0	38	0.535
10.003	0.430	0.836	14.8	2.3	1.221	1.232	0.000	0	21.0	0.0	40	0.605
10.004	0.614	2.028	80.6	2.3	1.373	1.250	0.000	0	21.0	0.0	26	0.876
10.005	0.356	0.811	32.2	2.8	1.250	1.509	0.000	0	31.0	0.0	44	0.492
10.006	0.364	0.810	32.2	3.0	1.509	1.831	0.000	0	37.0	0.0	47	0.509
11.000	0.374	1.136	20.1	0.7	1.191	1.590	0.000	0	2.0	0.0	20	0.524
12.000	0.486	1.587	28.0	0.9	1.214	1.228	0.000	0	3.0	0.0	18	0.704
11.001	0.520	1.227	21.7	1.8	1.590	1.225	0.000	0	13.0	0.0	30	0.739
11.002	0.600	1.484	26.2	1.8	1.225	1.356	0.000	0	13.0	0.0	27	0.837
10.007	0.392	0.808	32.1	3.9	1.831	2.729	0.000	0	60.0	0.0	53	0.547
10.008	0.401	0.810	32.2	4.1	2.729	2.587	0.000	0	68.0	0.0	54	0.554
13.000	0.398	1.133	20.0	0.9	1.191	1.619	0.000	0	3.0	0.0	21	0.553
13.001	0.469	1.132	20.0	1.5	1.619	2.014	0.000	0	9.0	0.0	28	0.656
13.002	0.402	0.796	14.1	2.1	2.014	1.572	0.000	0	17.0	0.0	39	0.566
13.003	0.378	0.968	38.5	2.3	1.497	1.399	0.000	0	21.0	0.0	37	0.528

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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)
13.004	TF 17	TF 18	20.096	1.500	26.880	26.780	0.100	201.0	225
13.005	TF 18	TF 24	13.163	1.500	26.780	26.440	0.340	38.7	225
14.000	TF 19	TF 20	28.200	1.500	28.030	27.560	0.470	60.0	150
14.001	TF 20	TF 21	13.055	1.500	27.550	27.320	0.230	56.8	150
14.002	TF 21	TF 22	15.802	1.500	27.320	27.120	0.200	79.0	150
14.003	TF 22	TF 23	62.783	1.500	27.120	26.804	0.316	198.7	225
14.004	TF 23	TF 24	8.956	1.500	26.804	26.440	0.364	24.6	225
13.006	TF 24	TF 25	30.803	1.500	26.440	25.430	1.010	30.5	225
13.007	TF 25	TF 26	12.779	1.500	25.430	25.000	0.430	29.7	225
13.008	TF 26	TF 27	28.632	1.500	25.000	24.700	0.300	95.4	225
10.009	TF 27	AF 13	26.742	1.500	23.440	23.306	0.134	199.6	225
15.000	AF 12	AF 13	52.369	1.500	25.120	24.588	0.532	98.4	150
10.010	AF 13	FR 2	51.992	1.500	23.306	23.046	0.260	200.0	225
1.016	FR 2	FR 3	82.010	1.500	22.114	20.899	1.215	67.5	300
16.000	KF1	KF2	24.297	1.500	20.334	19.929	0.405	60.0	150
16.001	KF2	KF3	20.290	1.500	19.929	19.591	0.338	60.0	150
16.002	KF3	KF4	45.467	1.500	19.516	19.213	0.303	150.1	225
16.003	KF4	KF8	17.703	1.500	19.213	19.124	0.089	198.9	225
17.000	KF5	KF6	39.568	1.500	23.383	22.723	0.660	60.0	150
17.001	KF6	KF7	28.188	1.500	22.723	22.253	0.470	60.0	150
17.002	KF7	KF8	30.300	1.500	22.253	21.748	0.505	60.0	150
16.004	KF8	KF9	42.053	1.500	19.124	18.914	0.210	200.3	225
16.005	KF9	KF10	20.688	1.500	18.914	18.811	0.103	200.9	225
16.006	KF10	KF12	19.357	1.500	18.811	18.714	0.097	199.6	225

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
13.004	0.340	0.808	32.1	2.5	1.400	1.217	0.000	0	25.0	0.0	43	0.478
13.005	0.603	1.848	73.5	2.5	1.217	1.241	0.000	0	25.0	0.0	29	0.851
14.000	0.480	1.132	20.0	1.6	1.239	1.482	0.000	0	10.0	0.0	29	0.673
14.001	0.493	1.164	20.6	1.7	1.492	1.597	0.000	0	11.0	0.0	29	0.692
14.002	0.446	0.986	17.4	1.7	1.597	1.309	0.000	0	12.0	0.0	32	0.622
14.003	0.349	0.813	32.3	2.7	1.234	1.199	0.000	0	30.0	0.0	44	0.493
14.004	0.731	2.319	92.2	2.7	1.199	1.241	0.000	0	30.0	0.0	27	1.025
13.006	0.750	2.082	82.8	3.8	1.241	1.234	0.000	0	58.0	0.0	33	1.052
13.007	0.760	2.110	83.9	3.9	1.234	1.404	0.000	0	60.0	0.0	33	1.066
13.008	0.506	1.175	46.7	3.9	1.404	1.327	0.000	0	61.0	0.0	44	0.714
10.009	0.442	0.811	32.2	5.8	2.587	2.503	0.000	0	133.0	0.0	65	0.614
15.000	0.423	0.883	15.6	1.9	1.454	1.296	0.000	0	14.0	0.0	35	0.593
10.010	0.454	0.810	32.2	6.3	2.503	1.900	0.000	0	158.0	0.0	67	0.627
1.016	0.757	1.689	119.4	10.8	2.757	1.882	0.000	0	465.0	0.0	61	1.048
16.000	0.422	1.132	20.0	1.1	1.200	2.075	0.000	0	5.0	0.0	24	0.602
16.001	0.468	1.132	20.0	1.5	2.075	2.808	0.000	0	9.0	0.0	28	0.656
16.002	0.365	0.936	37.2	2.2	2.808	3.639	0.000	0	20.0	0.0	37	0.510
16.003	0.341	0.812	32.3	2.4	3.639	3.985	0.000	0	23.0	0.0	42	0.475
17.000	0.446	1.133	20.0	1.3	1.200	1.969	0.000	0	7.0	0.0	26	0.629
17.001	0.446	1.132	20.0	1.3	1.969	2.053	0.000	0	7.0	0.0	26	0.629
17.002	0.512	1.132	20.0	2.1	2.053	1.436	0.000	0	17.0	0.0	33	0.722
16.004	0.379	0.809	32.2	3.5	3.985	4.705	0.000	0	48.0	0.0	50	0.526
16.005	0.385	0.808	32.1	3.6	4.705	5.098	0.000	0	53.0	0.0	51	0.536
16.006	0.387	0.811	32.2	3.7	5.098	5.446	0.000	0	56.0	0.0	51	0.538

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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)
18.000	KF11	KF12	30.105	1.500	21.641	21.139	0.502	60.0	150
16.007	KF12	KF15	70.611	1.500	18.714	18.361	0.353	200.0	225
19.000	KF13	KF15	45.745	1.500	20.490	19.727	0.763	60.0	150
20.000	KF14	KF15	44.884	1.500	23.851	22.065	1.786	25.1	150
16.008	KF15	FR 3	36.051	1.500	18.361	18.181	0.180	200.3	225
1.017	FR 3	FR 4	31.193	1.500	18.181	18.026	0.155	201.2	300
1.018	FR 4	FR 5	36.824	1.500	18.026	17.841	0.185	199.0	300
1.019	FR 5	FR 6	16.394	1.500	17.841	17.636	0.205	80.0	300
1.020	FR 6	FR 7	13.803	1.500	17.636	17.464	0.172	80.3	300
1.021	FR 7	FR 8	47.895	1.500	17.464	16.865	0.599	80.0	300
1.022	FR 8	Ex.F 7	18.007	1.500	15.822	15.814	0.008	2250.9	375

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
18.000	0.422	1.132	20.0	1.1	1.200	3.096	0.000	0	5.0	0.0	24	0.602
16.007	0.393	0.810	32.2	4.0	5.446	4.978	0.000	0	63.0	0.0	53	0.548
19.000	0.491	1.132	20.0	1.7	1.275	3.687	0.000	0	12.0	0.0	30	0.690
20.000	0.655	1.752	31.0	1.7	1.282	1.349	0.000	0	12.0	0.0	24	0.932
16.008	0.414	0.809	32.2	4.7	4.978	4.675	0.000	0	87.0	0.0	58	0.574
1.017	0.526	0.976	69.0	11.7	4.600	4.054	0.000	0	552.0	0.0	83	0.729
1.018	0.529	0.981	69.4	11.8	4.054	3.533	0.000	0	560.0	0.0	83	0.733
1.019	0.731	1.551	109.6	11.8	3.533	3.442	0.000	0	560.0	0.0	67	1.017
1.020	0.730	1.549	109.5	11.8	3.442	3.528	0.000	0	560.0	0.0	67	1.015
1.021	0.731	1.551	109.7	11.8	3.528	2.683	0.000	0	560.0	0.0	67	1.017
1.022	0.218	0.334	36.9	11.8	3.651	3.979	0.000	0	560.0	0.0	146	0.298

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)
1.000	27.139	60.0	150	Circular	32.036	30.662	1.224	32.164	30.210	1.804
1.001	32.418	33.8	150	Circular	32.164	30.210	1.804	30.622	29.250	1.222
1.002	25.631	28.5	150	Circular	30.622	29.250	1.222	29.403	28.350	0.903
2.000	26.870	60.0	150	Circular	29.281	28.117	1.014	29.403	27.669	1.584
1.003	10.378	49.7	225	Circular	29.403	27.669	1.509	28.910	27.460	1.225
1.004	52.271	35.0	225	Circular	28.910	27.093	1.592	27.110	25.600	1.285
1.005	29.709	199.4	225	Circular	27.110	24.441	2.444	26.331	24.292	1.814
3.000	17.285	21.4	150	Circular	26.698	25.100	1.448	26.331	24.292	1.889

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	MQF 1	1350	Manhole	Adoptable	MQF 2	1350	Manhole	Adoptable
1.001	MQF 2	1350	Manhole	Adoptable	MQF 3	1350	Manhole	Adoptable
1.002	MQF 3	1350	Manhole	Adoptable	MQF 4	1350	Manhole	Adoptable
2.000	MQF 4.1	1350	Manhole	Adoptable	MQF 4	1350	Manhole	Adoptable
1.003	MQF 4	1350	Manhole	Adoptable	MQF 5	1350	Manhole	Adoptable
1.004	MQF 5	1350	Manhole	Adoptable	MQF 7	1350	Manhole	Adoptable
1.005	MQF 7	1350	Manhole	Adoptable	MQF 8	1350	Manhole	Adoptable
3.000	MQF 8.1	1350	Manhole	Adoptable	MQF 8	1350	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)
1.006	19.644	200.4	225	Circular	26.331	24.292	1.814	25.850	24.194	1.431
1.007	34.323	199.6	225	Circular	25.850	24.194	1.431	25.572	24.022	1.325
1.008	13.433	200.5	225	Circular	25.572	24.022	1.325	25.460	23.955	1.280
1.009	29.702	200.7	225	Circular	25.460	23.955	1.280	25.471	23.807	1.439
4.000	16.297	59.9	150	Circular	25.050	23.690	1.210	25.041	23.418	1.473
4.001	32.314	150.3	225	Circular	25.041	23.418	1.398	25.471	23.203	2.043
1.010	6.911	160.7	225	Circular	25.471	22.900	2.346	25.459	22.857	2.377
5.000	17.771	60.0	225	Circular	25.021	23.580	1.216	25.294	23.284	1.785
5.001	34.565	148.3	225	Circular	25.294	23.284	1.785	25.459	23.051	2.183
1.011	28.261	199.0	225	Circular	25.459	22.857	2.377	24.871	22.715	1.931
6.000	37.066	104.1	300	Circular	25.453	23.885	1.268	25.411	23.529	1.582
7.000	11.102	31.4	225	Circular	25.726	23.869	1.632	25.411	23.515	1.671
6.001	34.735	77.7	300	Circular	25.411	23.515	1.596	24.428	23.068	1.060
6.002	42.092	199.5	300	Circular	24.428	22.992	1.136	24.696	22.781	1.615
6.003	26.517	200.9	300	Circular	24.696	22.781	1.615	24.871	22.649	1.922
1.012	31.723	162.7	300	Circular	24.871	22.649	1.922	25.029	22.454	2.275
1.013	41.659	199.3	300	Circular	25.029	22.454	2.275	25.003	22.245	2.458
8.000	21.927	60.1	150	Circular	25.199	23.849	1.200	25.170	23.484	1.536
8.001	28.206	106.8	150	Circular	25.170	23.484	1.536	25.174	23.220	1.804
9.000	20.320	40.0	150	Circular	26.154	24.208	1.796	25.174	23.700	1.324
8.002	37.639	78.9	225	Circular	25.174	23.220	1.729	25.003	22.743	2.035
1.014	6.775	199.3	300	Circular	25.003	22.245	2.458	24.995	22.211	2.484
1.015	19.481	200.8	300	Circular	24.995	22.211	2.484	25.171	22.114	2.757
10.000	20.906	60.1	150	Circular	27.526	26.180	1.196	27.261	25.832	1.279
10.001	17.496	59.9	150	Circular	27.261	25.832	1.279	27.012	25.540	1.322

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.006	MQF 8	1350	Manhole	Adoptable	MQF 9	1350	Manhole	Adoptable
1.007	MQF 9	1350	Manhole	Adoptable	MQF 10	1350	Manhole	Adoptable
1.008	MQF 10	1350	Manhole	Adoptable	MQF 11	1350	Manhole	Adoptable
1.009	MQF 11	1350	Manhole	Adoptable	MQF 12	1350	Manhole	Adoptable
4.000	MQF 12.2	1350	Manhole	Adoptable	MQF 12.1	1350	Manhole	Adoptable
4.001	MQF 12.1	1350	Manhole	Adoptable	MQF 12	1350	Manhole	Adoptable
1.010	MQF 12	1350	Manhole	Adoptable	MQF 13	1350	Manhole	Adoptable
5.000	MQF 13.2	1350	Manhole	Adoptable	MQF 13.1	1350	Manhole	Adoptable
5.001	MQF 13.1	1350	Manhole	Adoptable	MQF 13	1350	Manhole	Adoptable
1.011	MQF 13	1350	Manhole	Adoptable	MQF 18	1350	Manhole	Adoptable
6.000	PF 1	1350	Manhole	Adoptable	MQF 15	1350	Manhole	Adoptable
7.000	MQF 14	1350	Manhole	Adoptable	MQF 15	1350	Manhole	Adoptable
6.001	MQF 15	1350	Manhole	Adoptable	MQF 16	1350	Manhole	Adoptable
6.002	MQF 16	1350	Manhole	Adoptable	MQF 17	1350	Manhole	Adoptable
6.003	MQF 17	1350	Manhole	Adoptable	MQF 18	1350	Manhole	Adoptable
1.012	MQF 18	1350	Manhole	Adoptable	MQF 19	1350	Manhole	Adoptable
1.013	MQF 19	1350	Manhole	Adoptable	MQF 23	1350	Manhole	Adoptable
8.000	MQF 20	1350	Manhole	Adoptable	MQF 21	1200	Manhole	Adoptable
8.001	MQF 21	1200	Manhole	Adoptable	MQF 22	1350	Manhole	Adoptable
9.000	MQF 22.1	1350	Manhole	Adoptable	MQF 22	1350	Manhole	Adoptable
8.002	MQF 22	1350	Manhole	Adoptable	MQF 23	1350	Manhole	Adoptable
1.014	MQF 23	1350	Manhole	Adoptable	FR 1	1350	Manhole	Adoptable
1.015	FR 1	1350	Manhole	Adoptable	FR 2	1350	Manhole	Adoptable
10.000	TF 1	1350	Manhole	Adoptable	TF 2	1350	Manhole	Adoptable
10.001	TF 2	1350	Manhole	Adoptable	TF 3	1350	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)
10.002	25.158	132.4	150	Circular	27.012	25.540	1.322	26.721	25.350	1.221
10.003	38.379	109.7	150	Circular	26.721	25.350	1.221	26.382	25.000	1.232
10.004	21.676	32.2	225	Circular	26.382	24.784	1.373	25.585	24.110	1.250
10.005	36.947	199.7	225	Circular	25.585	24.110	1.250	25.659	23.925	1.509
10.006	29.167	199.8	225	Circular	25.659	23.925	1.509	25.835	23.779	1.831
11.000	32.318	59.6	150	Circular	27.371	26.030	1.191	27.228	25.488	1.590
12.000	18.680	30.6	150	Circular	27.824	26.460	1.214	27.228	25.850	1.228
11.001	35.162	51.1	150	Circular	27.228	25.488	1.590	26.175	24.800	1.225
11.002	16.478	35.0	150	Circular	26.175	24.800	1.225	25.835	24.329	1.356
10.007	37.167	200.9	225	Circular	25.835	23.779	1.831	26.548	23.594	2.729
10.008	30.766	199.8	225	Circular	26.548	23.594	2.729	26.252	23.440	2.587
13.000	13.485	59.9	150	Circular	29.311	27.970	1.191	29.514	27.745	1.619
13.001	17.211	60.0	150	Circular	29.514	27.745	1.619	29.622	27.458	2.014
13.002	50.510	120.8	150	Circular	29.622	27.458	2.014	28.762	27.040	1.572
13.003	22.313	140.3	225	Circular	28.762	27.040	1.497	28.505	26.881	1.399
13.004	20.096	201.0	225	Circular	28.505	26.880	1.400	28.222	26.780	1.217
13.005	13.163	38.7	225	Circular	28.222	26.780	1.217	27.906	26.440	1.241
14.000	28.200	60.0	150	Circular	29.419	28.030	1.239	29.192	27.560	1.482
14.001	13.055	56.8	150	Circular	29.192	27.550	1.492	29.067	27.320	1.597
14.002	15.802	79.0	150	Circular	29.067	27.320	1.597	28.579	27.120	1.309
14.003	62.783	198.7	225	Circular	28.579	27.120	1.234	28.228	26.804	1.199
14.004	8.956	24.6	225	Circular	28.228	26.804	1.199	27.906	26.440	1.241
13.006	30.803	30.5	225	Circular	27.906	26.440	1.241	26.889	25.430	1.234
13.007	12.779	29.7	225	Circular	26.889	25.430	1.234	26.629	25.000	1.404
13.008	28.632	95.4	225	Circular	26.629	25.000	1.404	26.252	24.700	1.327

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
10.002	TF 3	1350	Manhole	Adoptable	TF 4	1350	Manhole	Adoptable
10.003	TF 4	1350	Manhole	Adoptable	TF 5	1350	Manhole	Adoptable
10.004	TF 5	1350	Manhole	Adoptable	TF 6	1350	Manhole	Adoptable
10.005	TF 6	1350	Manhole	Adoptable	TF 7	1350	Manhole	Adoptable
10.006	TF 7	1350	Manhole	Adoptable	TF 11	1350	Manhole	Adoptable
11.000	TF 9.1	1350	Manhole	Adoptable	TF 9	1350	Manhole	Adoptable
12.000	TF 8	1350	Manhole	Adoptable	TF 9	1350	Manhole	Adoptable
11.001	TF 9	1350	Manhole	Adoptable	TF 10	1350	Manhole	Adoptable
11.002	TF 10	1350	Manhole	Adoptable	TF 11	1350	Manhole	Adoptable
10.007	TF 11	1350	Manhole	Adoptable	TF 12	1350	Manhole	Adoptable
10.008	TF 12	1350	Manhole	Adoptable	TF 27	1350	Manhole	Adoptable
13.000	TF 13	1350	Manhole	Adoptable	TF 14	1350	Manhole	Adoptable
13.001	TF 14	1350	Manhole	Adoptable	TF 15	1350	Manhole	Adoptable
13.002	TF 15	1350	Manhole	Adoptable	TF 16	1350	Manhole	Adoptable
13.003	TF 16	1350	Manhole	Adoptable	TF 17	1350	Manhole	Adoptable
13.004	TF 17	1350	Manhole	Adoptable	TF 18	1350	Manhole	Adoptable
13.005	TF 18	1350	Manhole	Adoptable	TF 24	1350	Manhole	Adoptable
14.000	TF 19	1350	Manhole	Adoptable	TF 20	1350	Manhole	Adoptable
14.001	TF 20	1350	Manhole	Adoptable	TF 21	1350	Manhole	Adoptable
14.002	TF 21	1350	Manhole	Adoptable	TF 22	1350	Manhole	Adoptable
14.003	TF 22	1350	Manhole	Adoptable	TF 23	1350	Manhole	Adoptable
14.004	TF 23	1350	Manhole	Adoptable	TF 24	1350	Manhole	Adoptable
13.006	TF 24	1350	Manhole	Adoptable	TF 25	1350	Manhole	Adoptable
13.007	TF 25	1350	Manhole	Adoptable	TF 26	1350	Manhole	Adoptable
13.008	TF 26	1350	Manhole	Adoptable	TF 27	1350	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)
10.009	26.742	199.6	225	Circular	26.252	23.440	2.587	26.034	23.306	2.503
15.000	52.369	98.4	150	Circular	26.724	25.120	1.454	26.034	24.588	1.296
10.010	51.992	200.0	225	Circular	26.034	23.306	2.503	25.171	23.046	1.900
1.016	82.010	67.5	300	Circular	25.171	22.114	2.757	23.081	20.899	1.882
16.000	24.297	60.0	150	Circular	21.684	20.334	1.200	22.154	19.929	2.075
16.001	20.290	60.0	150	Circular	22.154	19.929	2.075	22.549	19.591	2.808
16.002	45.467	150.1	225	Circular	22.549	19.516	2.808	23.077	19.213	3.639
16.003	17.703	198.9	225	Circular	23.077	19.213	3.639	23.334	19.124	3.985
17.000	39.568	60.0	150	Circular	24.733	23.383	1.200	24.842	22.723	1.969
17.001	28.188	60.0	150	Circular	24.842	22.723	1.969	24.456	22.253	2.053
17.002	30.300	60.0	150	Circular	24.456	22.253	2.053	23.334	21.748	1.436
16.004	42.053	200.3	225	Circular	23.334	19.124	3.985	23.844	18.914	4.705
16.005	20.688	200.9	225	Circular	23.844	18.914	4.705	24.134	18.811	5.098
16.006	19.357	199.6	225	Circular	24.134	18.811	5.098	24.385	18.714	5.446
18.000	30.105	60.0	150	Circular	22.991	21.641	1.200	24.385	21.139	3.096
16.007	70.611	200.0	225	Circular	24.385	18.714	5.446	23.564	18.361	4.978
19.000	45.745	60.0	150	Circular	21.915	20.490	1.275	23.564	19.727	3.687
20.000	44.884	25.1	150	Circular	25.283	23.851	1.282	23.564	22.065	1.349
16.008	36.051	200.3	225	Circular	23.564	18.361	4.978	23.081	18.181	4.675
1.017	31.193	201.2	300	Circular	23.081	18.181	4.600	22.380	18.026	4.054
1.018	36.824	199.0	300	Circular	22.380	18.026	4.054	21.674	17.841	3.533
1.019	16.394	80.0	300	Circular	21.674	17.841	3.533	21.378	17.636	3.442
1.020	13.803	80.3	300	Circular	21.378	17.636	3.442	21.292	17.464	3.528
1.021	47.895	80.0	300	Circular	21.292	17.464	3.528	19.848	16.865	2.683

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
10.009	TF 27	1350	Manhole	Adoptable	AF 13	1350	Manhole	Adoptable
15.000	AF 12	1350	Manhole	Adoptable	AF 13	1350	Manhole	Adoptable
10.010	AF 13	1350	Manhole	Adoptable	FR 2	1350	Manhole	Adoptable
1.016	FR 2	1350	Manhole	Adoptable	FR 3	1200	Manhole	Adoptable
16.000	KF1	1350	Manhole	Adoptable	KF2	1200	Manhole	Adoptable
16.001	KF2	1200	Manhole	Adoptable	KF3	1200	Manhole	Adoptable
16.002	KF3	1200	Manhole	Adoptable	KF4	1200	Manhole	Adoptable
16.003	KF4	1200	Manhole	Adoptable	KF8	1200	Manhole	Adoptable
17.000	KF5	1350	Manhole	Adoptable	KF6	1200	Manhole	Adoptable
17.001	KF6	1200	Manhole	Adoptable	KF7	1200	Manhole	Adoptable
17.002	KF7	1200	Manhole	Adoptable	KF8	1200	Manhole	Adoptable
16.004	KF8	1200	Manhole	Adoptable	KF9	1200	Manhole	Adoptable
16.005	KF9	1200	Manhole	Adoptable	KF10	1200	Manhole	Adoptable
16.006	KF10	1200	Manhole	Adoptable	KF12	1200	Manhole	Adoptable
18.000	KF11	1200	Manhole	Adoptable	KF12	1200	Manhole	Adoptable
16.007	KF12	1200	Manhole	Adoptable	KF15	1200	Manhole	Adoptable
19.000	KF13	1350	Manhole	Adoptable	KF15	1200	Manhole	Adoptable
20.000	KF14	1350	Manhole	Adoptable	KF15	1200	Manhole	Adoptable
16.008	KF15	1200	Manhole	Adoptable	FR 3	1200	Manhole	Adoptable
1.017	FR 3	1200	Manhole	Adoptable	FR 4	1350	Manhole	Adoptable
1.018	FR 4	1350	Manhole	Adoptable	FR 5	1350	Manhole	Adoptable
1.019	FR 5	1350	Manhole	Adoptable	FR 6	1200	Manhole	Adoptable
1.020	FR 6	1200	Manhole	Adoptable	FR 7	1350	Manhole	Adoptable
1.021	FR 7	1350	Manhole	Adoptable	FR 8	1350	Manhole	Adoptable

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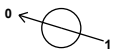
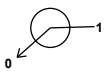
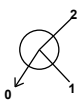
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Pipeline Schedule

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)
1.022	18.007	2250.9	375	Circular	19.848	15.822	3.651	20.168	15.814	3.979

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.022	FR 8	1350	Manhole	Adoptable	Ex.F 7	1350	Manhole	Adoptable

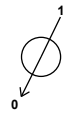
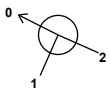
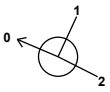
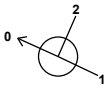
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MQF 1	526938.359	724921.203	32.036	1.374	1350		0	1.000	30.662	150
MQF 2	526930.300	724895.288	32.164	1.954	1350		1 0	1.000 1.001	30.210 30.210	150 150
MQF 3	526899.285	724904.722	30.622	1.372	1350		1 0	1.001 1.002	29.250 29.250	150 150
MQF 4.1	526882.671	724937.877	29.281	1.164	1350		0	2.000	28.117	150
MQF 4	526874.768	724912.196	29.403	1.734	1350		1 2 0	2.000 1.002 1.003	27.669 28.350 27.669	150 150 225
MQF 5	526864.393	724911.907	28.910	1.817	1350		1 0	1.003 1.004	27.460 27.093	225 225
MQF 7	526825.334	724877.171	27.110	2.669	1350		1 0	1.004 1.005	25.600 24.441	225 225
MQF 8.1	526815.876	724843.845	26.698	1.598	1350		0	3.000	25.100	150
MQF 8	526804.046	724856.447	26.331	2.039	1350		1 2 0	3.000 1.005 1.006	24.292 24.292 24.292	150 225 225
MQF 9	526793.326	724839.986	25.850	1.656	1350		1 0	1.006 1.007	24.194 24.194	225 225

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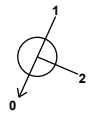
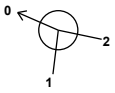
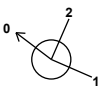
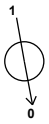
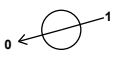
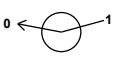
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MQF 10	526778.314	724809.121	25.572	1.550	1350	 1	1.007	24.022	225
						0	1.008	24.022	225
MQF 11	526772.316	724797.102	25.460	1.505	1350	 1	1.008	23.955	225
						0	1.009	23.955	225
MQF 12.2	526747.053	724773.026	25.050	1.360	1350				
						0	4.000	23.690	150
MQF 12.1	526732.124	724779.561	25.041	1.623	1350	 1	4.000	23.418	150
						0	4.001	23.418	225
MQF 12	526745.158	724809.129	25.471	2.571	1350	 1	4.001	23.203	225
						2	1.009	23.807	225
						0	1.010	22.900	225
MQF 13.2	526769.768	724836.451	25.021	1.441	1350				
						0	5.000	23.580	225
MQF 13.1	526753.504	724843.610	25.294	2.010	1350	 1	5.000	23.284	225
						0	5.001	23.284	225
MQF 13	526738.988	724812.242	25.459	2.602	1350	 1	5.001	23.051	225
						2	1.010	22.857	225
						0	1.011	22.857	225
PF 1	526787.806	724905.442	25.453	1.568	1350				
						0	6.000	23.885	300
MQF 14	526782.974	724866.719	25.726	1.857	1350				
						0	7.000	23.869	225
MQF 15	526772.947	724871.485	25.411	1.896	1350	 2	7.000	23.515	225
						2	6.000	23.529	300
						0	6.001	23.515	300
MQF 16	526741.307	724885.820	24.428	1.436	1350	1	6.001	23.068	300
						0	6.002	22.992	300
MQF 17	526723.936	724847.480	24.696	1.915	1350	 1	6.002	22.781	300
						0	6.003	22.781	300

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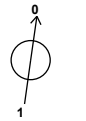
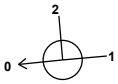
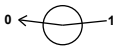
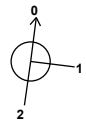
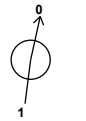
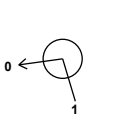
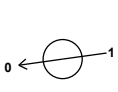
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MQF 18	526712.992	724823.327	24.871	2.222	1350		1	6.003	22.649	300
							2	1.011	22.715	225
							0	1.012	22.649	300
MQF 19	526699.899	724794.432	25.029	2.575	1350		1	1.012	22.454	300
							0	1.013	22.454	300
MQF 20	526758.371	724753.103	25.199	1.350	1350		0	8.000	23.849	150
MQF 21	526745.364	724735.451	25.170	1.686	1200		1	8.000	23.484	150
							0	8.001	23.484	150
MQF 22.1	526715.295	724721.052	26.154	1.946	1350		0	9.000	24.208	150
MQF 22	526717.755	724741.222	25.174	1.954	1350		1	9.000	23.700	150
							2	8.001	23.220	150
							0	8.002	23.220	225
MQF 23	526683.244	724756.246	25.003	2.758	1350		1	8.002	22.743	225
							2	1.013	22.245	300
							0	1.014	22.245	300
FR 1	526677.847	724760.341	24.995	2.784	1350		1	1.014	22.211	300
							0	1.015	22.211	300
TF 1	526704.417	724603.093	27.526	1.346	1350		0	10.000	26.180	150
TF 2	526708.077	724582.510	27.261	1.429	1350		1	10.000	25.832	150
							0	10.001	25.832	150
TF 3	526711.325	724565.318	27.012	1.472	1350		1	10.001	25.540	150
							0	10.002	25.540	150
TF 4	526687.114	724558.477	26.721	1.371	1350		1	10.002	25.350	150
							0	10.003	25.350	150
TF 5	526650.093	724548.359	26.382	1.598	1350		1	10.003	25.000	150
							0	10.004	24.784	225

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
TF 6	526628.798	724552.408	25.585	1.475	1350		1	10.004	24.110	225
							0	10.005	24.110	225
TF 7	526633.900	724589.000	25.659	1.734	1350		1	10.005	23.925	225
							0	10.006	23.925	225
TF 9.1	526686.583	724651.622	27.371	1.341	1350		0	11.000	26.030	150
TF 8	526707.958	724621.075	27.824	1.364	1350		0	12.000	26.460	150
TF 9	526689.352	724619.423	27.228	1.740	1350		1	12.000	25.850	150
							2	11.000	25.488	150
							0	11.001	25.488	150
TF 10	526654.370	724615.859	26.175	1.375	1350		1	11.001	24.800	150
							0	11.002	24.800	150
TF 11	526638.017	724617.875	25.835	2.056	1350		1	11.002	24.329	150
							2	10.006	23.779	225
							0	10.007	23.779	225
TF 12	526642.741	724654.741	26.548	2.954	1350		1	10.007	23.594	225
							0	10.008	23.594	225
TF 13	526796.036	724628.912	29.311	1.341	1350		0	13.000	27.970	150
TF 14	526794.668	724642.327	29.514	1.769	1350		1	13.000	27.745	150
							0	13.001	27.745	150
TF 15	526787.059	724657.765	29.622	2.164	1350		1	13.001	27.458	150
							0	13.002	27.458	150
TF 16	526772.602	724706.162	28.762	1.722	1350		1	13.002	27.040	150
							0	13.003	27.040	225
TF 17	526750.499	724703.109	28.505	1.625	1350		1	13.003	26.881	225
							0	13.004	26.880	225

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
TF 18	526730.598	724700.316	28.222	1.442	1350	1	13.004	26.780	225
						0	13.005	26.780	225
TF 19	526785.454	724621.282	29.419	1.389	1350	0	14.000	28.030	150
TF 20	526757.389	724618.525	29.192	1.642	1350	1	14.000	27.560	150
						0	14.001	27.550	150
TF 21	526744.396	724617.249	29.067	1.747	1350	1	14.001	27.320	150
						0	14.002	27.320	150
TF 22	526735.001	724629.955	28.579	1.459	1350	1	14.002	27.120	150
						0	14.003	27.120	225
TF 23	526728.981	724692.449	28.228	1.424	1350	1	14.003	26.804	225
						0	14.004	26.804	225
TF 24	526720.025	724692.475	27.906	1.466	1350	1	14.004	26.440	225
						2	13.005	26.440	225
						0	13.006	26.440	225
TF 25	526689.692	724687.121	26.889	1.459	1350	1	13.006	25.430	225
						0	13.007	25.430	225
TF 26	526677.911	724682.169	26.629	1.629	1350	1	13.007	25.000	225
						0	13.008	25.000	225
TF 27	526649.398	724684.777	26.252	2.812	1350	1	13.008	24.700	225
						2	10.008	23.440	225
						0	10.009	23.440	225
AF 12	526704.320	724705.527	26.724	1.604	1350	0	15.000	25.120	150
AF 13	526652.278	724711.364	26.034	2.728	1350	1	15.000	24.588	150
						2	10.009	23.306	225
						0	10.010	23.306	225
FR 2	526658.545	724762.977	25.171	3.057	1350	1	10.010	23.046	225
						2	1.015	22.114	300
						0	1.016	22.114	300

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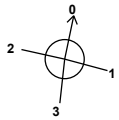
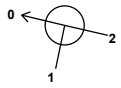
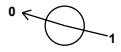
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
KF1	526565.096	724487.223	21.684	1.350	1350	0			
						0	16.000	20.334	150
KF2	526560.920	724511.158	22.154	2.225	1200	1	16.000	19.929	150
						0	16.001	19.929	150
KF3	526560.923	724531.448	22.549	3.033	1200	1	16.001	19.591	150
						0	16.002	19.516	225
KF4	526561.386	724576.913	23.077	3.864	1200	1	16.002	19.213	225
						0	16.003	19.213	225
KF5	526615.451	724551.994	24.733	1.350	1350	0			
						0	17.000	23.383	150
KF6	526616.455	724591.549	24.842	2.119	1200	1	17.000	22.723	150
						0	17.001	22.723	150
KF7	526588.764	724596.817	24.456	2.203	1200	1	17.001	22.253	150
						0	17.002	22.253	150
KF8	526558.562	724594.389	23.334	4.210	1200	1	17.002	21.748	150
						2	16.003	19.124	225
						0	16.004	19.124	225
KF9	526557.325	724636.424	23.844	4.930	1200	1	16.004	18.914	225
						0	16.005	18.914	225
KF10	526561.841	724656.613	24.134	5.323	1200	1	16.005	18.811	225
						0	16.006	18.811	225
KF11	526533.536	724678.458	22.991	1.350	1200	0			
						0	18.000	21.641	150
KF12	526563.532	724675.896	24.385	5.671	1200	1	18.000	21.139	150
						2	16.006	18.714	225
						0	16.007	18.714	225
KF13	526526.597	724755.990	21.915	1.425	1350	0			
						0	19.000	20.490	150

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
KF14	526614.606	724734.450	25.283	1.432	1350		0	20.000	23.851	150
KF15	526571.256	724746.083	23.564	5.203	1200		1	20.000	22.065	150
							2	19.000	19.727	150
							3	16.007	18.361	225
							0	16.008	18.361	225
FR 3	526578.624	724781.373	23.081	4.900	1200		1	16.008	18.181	225
							2	1.016	20.899	300
							0	1.017	18.181	300
FR 4	526548.282	724788.609	22.380	4.354	1350		1	1.017	18.026	300
							0	1.018	18.026	300
FR 5	526513.065	724799.367	21.674	3.833	1350		1	1.018	17.841	300
							0	1.019	17.841	300
FR 6	526501.440	724810.927	21.378	3.742	1200		1	1.019	17.636	300
							0	1.020	17.636	300
FR 7	526490.875	724819.809	21.292	3.828	1350		1	1.020	17.464	300
							0	1.021	17.464	300
FR 8	526469.192	724862.515	19.848	4.026	1350		1	1.021	16.865	300
							0	1.022	15.822	375
Ex.F 7	526452.498	724855.767	20.168	4.354	1350		1	1.022	15.814	375

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Appendix B Storm Network Design

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	15.400	Minimum Backdrop Height (m)	0.200
Ratio-R	0.314	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	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)
MQS 1	0.166	5.00	32.064	1350	526940.117	724922.095	1.448
MQS 2	0.014	5.00	32.402	1350	526929.699	724889.332	1.967
MQS 3	0.035	5.00	31.887	1200	526920.314	724892.216	2.620
MQS 4	0.057	5.00	30.589	1200	526896.401	724899.565	2.379
MQS 5.1	0.047	5.00	29.307	1350	526884.457	724938.587	1.237
MQS 5	0.010	5.00	29.404	1200	526874.563	724906.276	2.374
MQS 6	0.042	5.00	28.820	1200	526863.730	724909.605	2.185
MQS 7	0.083	5.00	28.020	1200	526851.181	724898.332	2.054
MQS 8	0.054	5.00	27.099	1200	526825.514	724874.882	3.109
MQS 9.3	0.059	5.00	29.617	1200	526871.810	724859.107	2.037
MQS 9.2	0.060	5.00	28.341	1200	526859.496	724826.038	1.962
MQS 9.1	0.012	5.00	26.732	1350	526815.588	724841.948	1.688
MQS 9	0.010	5.00	26.239	1200	526804.288	724852.628	2.494
MQS 10	0.055	5.00	25.894	1200	526795.087	724840.358	2.226
MQS 11	0.058	5.00	25.611	1200	526779.892	724809.550	2.094
MQS 12.1		5.00	25.461	1350	526783.259	724790.611	2.808
MQS 12	0.035	5.00	25.486	1200	526772.990	724795.181	3.133
MQS 13.2	0.069	5.00	25.062	1350	526746.327	724774.776	1.396
MQS 13.1	0.094	5.00	25.088	1350	526733.862	724780.477	1.498
MQS 13			25.435	1200	526745.746	724807.407	2.987
MQS 14.2	0.085	5.00	24.979	1350	526770.160	724834.761	1.419
MQS 14.1	0.088	5.00	25.255	1350	526754.188	724841.990	2.498
MQS 14	0.044	5.00	25.434	1200	526739.372	724810.041	3.029
PS 1	0.217	5.00	25.450	1200	526855.290	724937.094	1.914
PS 2	0.076	5.00	25.400	1200	526781.245	724969.274	2.095
PS 3	0.113	5.00	24.810	1200	526757.183	724917.227	1.969
PS 4	0.259	5.00	25.392	1350	526785.711	724904.550	2.340
PS 5.1		5.00	25.514	1350	526779.175	724881.181	2.537
PS 5.2		5.00	25.342	1350	526772.972	724883.956	2.365
PS 5			25.455	1200	526775.622	724882.229	2.779
MQS 15	0.031	5.00	25.749	1350	526783.348	724865.256	1.943
MQS 16	0.035	5.00	25.363	1200	526770.898	724870.933	2.463
MQS 17	0.038	5.00	24.472	1200	526742.179	724884.048	1.965
MQS 18	0.028	5.00	24.728	1200	526725.790	724847.878	2.420
MQS 19	0.021	5.00	24.908	1200	526713.892	724821.619	2.749
MQS 20	0.035	5.00	25.041	1350	526701.775	724794.877	3.028
MQS 21			25.104	1200	526688.760	724765.164	3.404
MQS 22	0.031	5.00	25.355	1200	526767.366	724778.071	2.822
MQS 23	0.040	5.00	25.229	1200	526758.324	724755.205	2.860
MQS 24	0.067	5.00	25.206	1200	526744.910	724736.809	2.989
MQS 25.1	0.039	5.00	26.233	1200	526716.396	724719.208	2.021

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Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
MQS 25	0.073	5.00	25.213	1200	526719.492	724742.019	3.185
MQS 26.1	0.019	5.00	25.299	1200	526689.702	724735.233	1.706
MQS 26	0.023	5.00	25.018	1200	526692.366	724753.706	3.268
SR 1			24.997	1500	526679.344	724761.441	3.348
TS 1	0.089	5.00	27.514	1350	526705.451	724604.310	1.664
TS 2	0.071	5.00	26.967	1350	526712.783	724564.380	1.522
TS 3	0.071	5.00	26.755	1350	526688.909	724557.716	1.557
TS 4	0.026	5.00	26.405	1350	526649.887	724547.018	2.268
TS 5.1		5.00	25.638	1350	526625.740	724549.343	1.552
TS 5	0.133	5.00	25.514	1350	526626.649	724551.510	1.914
TS 28	0.057	5.00	27.422	1350	526687.757	724653.511	1.693
TS 9	0.062	5.00	28.107	1200	526714.700	724619.967	1.813
TS 10	0.091	5.00	27.312	1200	526691.121	724618.270	2.219
TS 12	0.030	5.00	26.232	1200	526655.224	724614.516	1.838
TS 13			25.844	1200	526636.526	724616.756	2.274
TS 14	0.147	5.00	26.546	1200	526641.254	724653.932	3.163
TS 15	0.109	5.00	29.339	1350	526797.014	724630.595	2.024
TS 16	0.062	5.00	29.561	1350	526795.746	724643.868	2.313
TS 17	0.106	5.00	29.660	1350	526787.961	724659.238	2.498
TS 18			28.724	1200	526773.501	724708.184	1.817
TS 19	0.084	5.00	28.173	1350	526729.322	724701.526	1.556
TS 20		5.00	29.428	1350	526787.260	724620.199	1.632
TS 21	0.015	5.00	29.047	1350	526743.042	724615.832	1.858
TS 22.1		5.00	28.529	1200	526731.672	724629.251	2.110
TS 22	0.132	5.00	28.525	1200	526733.036	724630.805	2.407
TS 23.1	0.045	5.00	29.293	1200	526763.113	724672.140	2.626
TS 23	0.032	5.00	28.481	1200	526729.921	724669.407	2.250
TS 24	0.011	5.00	28.215	1200	526727.798	724690.572	2.124
TS 25	0.047	5.00	27.960	1200	526721.490	724695.402	2.443
TS 26.1		5.00	26.987	1350	526686.659	724693.562	1.889
TS 26	0.021	5.00	26.817	1350	526688.649	724689.219	2.019
TS 31	0.032	5.00	26.585	1200	526678.808	724684.312	1.567
TS 32	0.044	5.00	26.284	1200	526648.479	724688.035	3.076
AS 13.1	0.041	5.00	26.733	1200	526705.656	724703.981	1.683
AS 13	0.167	5.00	26.102	1200	526650.646	724709.747	3.003
SR 2	0.064	5.00	25.228	1500	526657.470	724765.138	3.690
SR 3			23.993	1500	526611.596	724775.223	4.560
KS1	0.076	5.00	21.746	1350	526566.022	724488.980	1.950
KS2	0.209	5.00	22.212	1200	526562.168	724512.538	2.195
KS3	0.056	5.00	23.122	1200	526562.528	724578.255	3.324
KS4	0.071	5.00	24.734	1350	526616.708	724553.497	1.525
KS5	0.024	5.00	24.866	1200	526617.687	724592.655	1.853
KS6	0.099	5.00	24.551	1350	526592.549	724598.033	1.667
KS7	0.111	5.00	23.405	1200	526559.809	724596.909	3.670
KS8	0.066	5.00	23.897	1200	526558.873	724637.500	4.298
KS9	0.047	5.00	24.190	1200	526563.358	724657.993	4.661
KS10	0.064	5.00	23.049	1350	526534.275	724679.556	1.425
KS11	0.068	5.00	24.400	1350	526564.886	724677.130	4.954
KS12		5.00	23.978	1350	526559.340	724709.133	4.618
KS13		5.00	24.309	1350	526574.971	724707.374	4.949
KS14	0.035	5.00	24.025	1500	526568.436	724708.280	4.964
KS15	0.169	5.00	21.868	1350	526524.990	724757.438	2.443

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Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
KS16	0.155	5.00	25.259	1200	526613.742	724735.846	3.622
KS17	0.027	5.00	23.575	1500	526572.902	724747.469	4.345
SR 4	0.179	5.00	23.150	1500	526580.180	724782.517	4.040
SR 5.1		5.00	22.478	1350	526552.611	724790.316	3.598
SR 5	0.089	5.00	22.436	1500	526549.766	724789.579	3.856
SR 6			21.738	1800	526514.900	724800.369	3.041
SR 7	0.032	5.00	21.734	1800	526512.464	724809.040	3.382
Ex.S 6			21.385	1350	526501.274	724809.544	3.655
Ex.S 7			21.290	1350	526489.319	724819.743	3.682
KS18			23.181	1350	526577.922	724771.641	4.334

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)
1.000	MQS 1	MQS 2	34.380	0.600	30.616	30.435	0.181	189.9	225	5.61	38.7
1.001	MQS 2	MQS 3	9.818	0.600	30.435	30.383	0.052	188.8	225	5.78	38.3
1.002	MQS 3	MQS 4	25.017	0.600	29.567	29.400	0.167	149.8	225	6.17	37.3
1.003	MQS 4	MQS 5	22.846	0.600	28.510	28.396	0.114	200.4	225	6.58	36.3
2.000	MQS 5.1	MQS 5	33.791	0.600	28.070	27.700	0.370	91.3	225	5.41	39.3
1.004	MQS 5	MQS 6	11.333	0.600	27.330	27.230	0.100	113.3	225	6.74	35.9
1.005	MQS 6	MQS 7	16.870	0.600	26.635	26.470	0.165	102.2	225	6.96	35.4
1.006	MQS 7	MQS 8	34.766	0.600	25.966	25.619	0.347	100.2	225	7.40	34.5
1.007	MQS 8	MQS 9	30.753	0.600	23.990	23.745	0.245	125.5	300	7.76	33.8
3.000	MQS 9.3	MQS 9.2	35.287	0.600	27.580	26.950	0.630	56.0	225	5.34	39.5
3.001	MQS 9.2	MQS 9.1	46.701	0.600	26.379	25.044	1.335	35.0	225	5.69	38.5
3.002	MQS 9.1	MQS 9	15.549	0.600	25.044	24.600	0.444	35.0	225	5.80	38.2
1.008	MQS 9	MQS 10	15.337	0.600	23.745	23.668	0.077	199.2	300	8.00	33.3
1.009	MQS 10	MQS 11	34.351	0.600	23.668	23.517	0.151	227.5	300	8.55	32.3
1.010	MQS 11	MQS 12	15.941	0.600	23.517	23.400	0.117	136.2	300	8.74	32.0
4.000	MQS 12.1	MQS 12	11.240	0.600	22.653	22.653	0.000	0.0	300	5.25	39.8

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)
1.000	0.945	37.6	17.4	1.223	1.742	0.166	0.0	108	0.928
1.001	0.948	37.7	18.7	1.742	1.279	0.180	0.0	112	0.946
1.002	1.066	42.4	21.8	2.095	0.964	0.215	0.0	115	1.074
1.003	0.920	36.6	26.7	1.854	0.783	0.272	0.0	143	1.001
2.000	1.368	54.4	5.0	1.012	1.479	0.047	0.0	46	0.863
1.004	1.227	48.8	32.1	1.849	1.365	0.329	0.0	133	1.307
1.005	1.293	51.4	35.6	1.960	1.325	0.371	0.0	138	1.394
1.006	1.306	51.9	42.4	1.829	1.255	0.454	0.0	155	1.452
1.007	1.402	99.1	46.5	2.809	2.194	0.508	0.0	144	1.380
3.000	1.751	69.6	6.3	1.812	1.166	0.059	0.0	45	1.092
3.001	2.219	88.2	12.4	1.737	1.463	0.119	0.0	57	1.577
3.002	2.218	88.2	13.6	1.463	1.414	0.131	0.0	59	1.617
1.008	1.110	78.5	58.7	2.194	1.926	0.650	0.0	194	1.213
1.009	1.038	73.4	61.7	1.926	1.794	0.705	0.0	212	1.159
1.010	1.345	95.1	66.1	1.794	1.786	0.763	0.0	184	1.449
4.000	0.750	53.0	0.0	2.508	2.533	0.000	0.0	0	0.000

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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)
1.011	MQS 12	MQS 13	29.862	0.600	22.653	22.523	0.130	229.7	300	9.23	31.2
5.000	MQS 13.2	MQS 13.1	13.707	0.600	23.666	23.590	0.076	180.4	225	5.24	39.8
5.001	MQS 13.1	MQS 13	29.436	0.600	23.590	23.430	0.160	184.0	225	5.75	38.4
1.012	MQS 13	MQS 14	6.897	0.600	22.448	22.405	0.043	160.4	300	9.32	31.0
6.000	MQS 14.2	MQS 14.1	17.532	0.600	23.560	23.400	0.160	109.6	225	5.23	39.8
6.001	MQS 14.1	MQS 14	35.217	0.600	22.757	22.405	0.352	100.0	225	5.68	38.5
1.013	MQS 14	MQS 19	27.987	0.600	22.405	22.159	0.246	113.8	300	9.64	30.5
7.000	PS 1	PS 2	80.736	0.600	23.536	23.305	0.231	349.5	300	6.61	36.2
7.001	PS 2	PS 3	57.340	0.600	23.305	23.141	0.164	349.6	300	7.76	33.8
7.002	PS 3	PS 4	31.218	0.600	23.141	23.052	0.089	350.8	300	8.38	32.6
7.003	PS 4	PS 5	24.495	0.600	23.052	22.976	0.076	322.3	300	8.85	31.8
8.000	PS 5.1	PS 5	3.704	0.600	22.977	22.976	0.001	3704.0	300	5.25	39.8
9.000	PS 5.2	PS 5	3.163	0.600	22.977	22.976	0.001	3163.0	300	5.20	39.9
7.004	PS 5	MQS 16	12.244	0.600	22.976	22.900	0.076	161.1	300	9.01	31.5
10.000	MQS 15	MQS 16	13.683	0.600	23.806	23.680	0.126	108.6	225	5.18	40.0
7.005	MQS 16	MQS 17	31.572	0.600	22.900	22.507	0.393	80.3	300	9.31	31.0
7.006	MQS 17	MQS 18	39.709	0.600	22.507	22.308	0.199	199.5	300	9.91	30.1
7.007	MQS 18	MQS 19	28.829	0.600	22.308	22.164	0.144	200.2	300	10.34	29.5
1.014	MQS 19	MQS 20	29.359	0.600	22.159	22.013	0.146	201.1	300	10.79	28.9
1.015	MQS 20	MQS 21	32.439	0.600	22.013	21.700	0.313	103.6	300	11.14	28.4
1.016	MQS 21	SR 1	10.125	0.600	21.700	21.649	0.051	198.5	300	11.29	28.2
11.000	MQS 12	MQS 22	18.011	0.600	22.653	22.533	0.120	150.1	300	5.23	39.8
11.001	MQS 22	MQS 23	24.589	0.600	22.533	22.369	0.164	149.9	300	5.55	38.9
11.002	MQS 23	MQS 24	22.768	0.600	22.369	22.217	0.152	149.8	300	5.85	38.1

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)
1.011	1.033	73.0	67.4	2.533	2.612	0.798	0.0	229	1.167
5.000	0.970	38.6	7.4	1.171	1.273	0.069	0.0	66	0.750
5.001	0.960	38.2	16.9	1.273	1.780	0.163	0.0	105	0.933
1.012	1.239	87.5	80.8	2.687	2.729	0.961	0.0	228	1.399
6.000	1.248	49.6	9.2	1.194	1.630	0.085	0.0	65	0.959
6.001	1.307	52.0	18.1	2.273	2.804	0.173	0.0	92	1.194
1.013	1.473	104.1	97.4	2.729	2.449	1.178	0.0	231	1.665
7.000	0.835	59.0	21.3	1.614	1.795	0.217	0.0	125	0.769
7.001	0.835	59.0	26.9	1.795	1.369	0.294	0.0	142	0.816
7.002	0.834	58.9	36.0	1.369	2.040	0.407	0.0	170	0.874
7.003	0.870	61.5	57.4	2.040	2.179	0.666	0.0	231	0.984
8.000	0.249	17.6	0.0	2.237	2.179	0.000	0.0	0	0.000
9.000	0.270	19.1	0.0	2.065	2.179	0.000	0.0	0	0.000
7.004	1.236	87.4	56.9	2.179	2.163	0.666	0.0	177	1.313
10.000	1.254	49.9	3.3	1.718	1.458	0.031	0.0	39	0.716
7.005	1.755	124.1	61.5	2.163	1.665	0.732	0.0	149	1.751
7.006	1.109	78.4	62.9	1.665	2.120	0.770	0.0	204	1.228
7.007	1.107	78.3	63.8	2.120	2.444	0.798	0.0	207	1.230
1.014	1.105	78.1	156.3	2.449	2.728	1.997	0.0	300	1.119
1.015	1.544	109.1	156.6	2.728	3.104	2.032	0.0	300	1.564
1.016	1.112	78.6	155.5	3.104	3.048	2.032	0.0	300	1.126
11.000	1.281	90.5	0.0	2.533	2.522	0.000	0.0	0	0.000
11.001	1.281	90.6	3.3	2.522	2.560	0.031	0.0	38	0.609
11.002	1.282	90.6	7.3	2.560	2.689	0.071	0.0	57	0.777

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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)
11.003	MQS 24	MQS 25	25.947	0.600	22.217	22.028	0.189	137.3	300	6.57	37.3
12.000	MQS 25.1	MQS 25	23.021	0.600	24.212	23.700	0.512	45.0	225	5.20	39.9
11.004	MQS 25	MQS 26	29.536	0.600	22.028	21.847	0.181	163.2	300	6.57	36.3
13.000	MQS 26.1	MQS 26	18.664	0.600	23.593	23.500	0.093	200.7	225	5.34	39.5
11.005	MQS 26	SR 1	15.147	0.600	21.750	21.649	0.101	150.0	300	6.77	35.8
1.017	SR 1	SR 2	22.184	0.600	21.649	21.538	0.111	199.9	450	11.55	27.9
14.000	TS 1	TS 2	40.597	0.600	25.850	25.445	0.405	100.2	225	5.52	39.0
14.001	TS 2	TS 3	24.787	0.600	25.445	25.198	0.247	100.4	225	5.83	38.1
14.002	TS 3	TS 4	40.462	0.600	25.198	24.920	0.278	145.5	225	6.46	36.6
14.003	TS 4	TS 5	23.668	0.600	24.137	23.900	0.237	99.9	300	6.71	36.0
15.000	TS 5.1	TS 5	2.350	0.600	24.086	24.085	0.001	2350.0	300	5.12	40.1
14.004	TS 5	TS 13	65.990	0.600	23.900	23.570	0.330	200.0	300	7.70	33.9
16.000	TS 28	TS 10	35.401	0.600	25.729	25.325	0.404	87.6	225	5.42	39.3
17.000	TS 9	TS 10	23.640	0.600	26.294	25.900	0.394	60.0	225	5.23	39.8
16.001	TS 10	TS 12	36.093	0.600	25.093	24.800	0.293	123.2	225	5.93	37.9
16.002	TS 12	TS 13	18.831	0.600	24.394	24.300	0.094	200.3	225	6.27	37.0
14.005	TS 13	TS 14	37.475	0.600	23.570	23.383	0.187	200.4	300	8.27	32.8
14.006	TS 14	TS 32	34.861	0.600	23.383	23.208	0.175	199.2	300	8.79	31.9
18.000	TS 15	TS 16	13.333	0.600	27.315	27.248	0.067	199.0	300	5.20	39.9
18.001	TS 16	TS 17	17.229	0.600	27.248	27.162	0.086	200.3	300	5.46	39.2
18.002	TS 17	TS 18	51.037	0.600	27.162	26.907	0.255	200.1	300	6.23	37.1
18.003	TS 18	TS 19	44.678	0.600	26.907	26.617	0.290	154.1	300	6.82	35.7
18.004	TS 19	TS 25	9.943	0.600	26.617	26.425	0.192	51.8	300	6.89	35.6
19.000	TS 20	TS 21	44.433	0.600	27.796	27.500	0.296	150.1	225	5.70	38.5

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)
11.003	1.340	94.7	13.9	2.689	2.885	0.138	0.0	78	0.968
12.000	1.956	77.8	4.2	1.796	1.288	0.039	0.0	36	1.057
11.004	1.228	86.8	24.6	2.885	2.871	0.250	0.0	109	1.060
13.000	0.919	36.5	2.0	1.481	1.293	0.019	0.0	36	0.494
11.005	1.281	90.6	28.3	2.968	3.048	0.291	0.0	115	1.138
1.017	1.434	228.1	175.8	2.898	3.240	2.324	0.0	298	1.575
14.000	1.306	51.9	9.4	1.439	1.297	0.089	0.0	65	0.996
14.001	1.305	51.9	16.6	1.297	1.332	0.160	0.0	87	1.165
14.002	1.081	43.0	22.9	1.332	1.260	0.231	0.0	116	1.097
14.003	1.573	111.2	25.0	1.968	1.314	0.257	0.0	96	1.278
15.000	0.315	22.3	0.0	1.252	1.129	0.000	0.0	0	0.000
14.004	1.108	78.3	35.8	1.314	1.974	0.390	0.0	142	1.083
16.000	1.397	55.6	6.0	1.468	1.762	0.057	0.0	50	0.919
17.000	1.691	67.2	6.7	1.588	1.187	0.062	0.0	48	1.091
16.001	1.177	46.8	21.6	1.994	1.207	0.210	0.0	107	1.151
16.002	0.920	36.6	24.1	1.613	1.319	0.240	0.0	133	0.980
14.005	1.107	78.2	56.0	1.974	2.863	0.630	0.0	188	1.200
14.006	1.110	78.5	67.1	2.863	2.776	0.777	0.0	214	1.242
18.000	1.111	78.5	11.8	1.724	2.013	0.109	0.0	78	0.805
18.001	1.107	78.2	18.2	2.013	2.198	0.171	0.0	98	0.907
18.002	1.107	78.3	27.9	2.198	1.517	0.278	0.0	123	1.016
18.003	1.264	89.3	26.9	1.517	1.256	0.278	0.0	113	1.111
18.004	2.189	154.8	34.9	1.256	1.235	0.362	0.0	96	1.779
19.000	1.065	42.3	0.0	1.407	1.322	0.000	0.0	0	0.000

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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)
19.001	TS 21	TS 22	18.009	0.600	27.189	27.100	0.089	202.3	225	6.02	37.6
20.000	TS 22.1	TS 22	2.068	0.600	26.419	26.418	0.001	2068.0	300	5.10	40.2
19.002	TS 22	TS 23	38.727	0.600	26.418	26.231	0.187	207.1	225	6.74	35.9
21.000	TS 23.1	TS 23	33.305	0.600	26.667	26.231	0.436	76.4	225	5.37	39.4
19.003	TS 23	TS 24	21.272	0.600	26.231	26.091	0.140	151.9	225	7.07	35.2
19.004	TS 24	TS 25	7.945	0.600	26.091	26.030	0.061	130.2	225	7.19	34.9
18.005	TS 25	TS 26	33.418	0.600	25.517	25.300	0.217	154.0	300	7.63	34.0
22.000	TS 26.1	TS 26	4.778	0.600	25.098	25.098	0.000	0.0	300	5.11	40.2
18.006	TS 26	TS 31	10.996	0.600	25.098	25.018	0.080	137.5	225	7.79	33.7
18.007	TS 31	TS 32	30.557	0.600	25.018	24.690	0.328	93.2	225	8.17	33.0
14.007	TS 32	AS 13	21.820	0.600	23.208	23.099	0.109	200.2	300	9.12	31.3
23.000	AS 13.1	AS 13	55.311	0.600	25.050	24.475	0.575	96.2	225	5.69	38.5
14.008	AS 13	SR 2	55.810	0.600	23.099	22.820	0.279	200.0	300	9.96	30.0
1.018	SR 2	SR 3	46.969	0.600	21.538	21.385	0.153	307.0	450	12.23	27.1
1.019	SR 3	SR 4	32.252	0.600	19.433	19.110	0.323	99.9	450	12.49	26.8
24.000	KS1	KS2	23.871	0.600	20.096	20.017	0.079	302.2	375	5.38	39.4
24.001	KS2	KS3	65.719	0.600	20.017	19.798	0.219	300.1	375	6.44	36.6
24.002	KS3	KS7	18.851	0.600	19.798	19.735	0.063	299.2	375	6.74	35.9
25.000	KS4	KS5	39.171	0.600	23.209	23.013	0.196	199.9	225	5.71	38.5
25.001	KS5	KS6	25.707	0.600	23.013	22.884	0.129	199.3	225	6.17	37.3
25.002	KS6	KS7	32.759	0.600	22.885	21.800	1.085	30.2	225	6.40	36.7
24.003	KS7	KS8	40.602	0.600	19.735	19.599	0.136	298.5	375	7.39	34.5
24.004	KS8	KS9	20.978	0.600	19.599	19.529	0.070	299.7	375	7.72	33.8
24.005	KS9	KS11	19.197	0.600	19.529	19.446	0.083	231.3	375	7.99	33.3

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)
19.001	0.915	36.4	1.5	1.633	1.200	0.015	0.0	31	0.453
20.000	0.337	23.8	0.0	1.810	1.807	0.000	0.0	0	0.000
19.002	0.905	36.0	14.3	1.882	2.025	0.147	0.0	99	0.855
21.000	1.497	59.5	4.8	2.401	2.025	0.045	0.0	44	0.912
19.003	1.058	42.1	21.4	2.025	1.899	0.224	0.0	114	1.063
19.004	1.144	45.5	22.3	1.899	1.705	0.235	0.0	111	1.138
18.005	1.264	89.4	59.4	2.143	1.217	0.645	0.0	179	1.349
22.000	0.750	53.0	0.0	1.589	1.419	0.000	0.0	0	0.000
18.006	1.113	44.3	60.8	1.494	1.342	0.666	0.0	225	1.134
18.007	1.355	53.9	62.4	1.342	1.369	0.697	0.0	225	1.380
14.007	1.107	78.3	129.0	2.776	2.703	1.518	0.0	300	1.122
23.000	1.333	53.0	4.2	1.458	1.402	0.041	0.0	43	0.802
14.008	1.108	78.3	140.5	2.703	2.108	1.725	0.0	300	1.122
1.018	1.155	183.7	302.3	3.240	2.158	4.113	0.0	450	1.169
1.019	2.034	323.5	298.9	4.110	3.590	4.113	0.0	343	2.294
24.000	1.037	114.5	8.1	1.275	1.820	0.076	0.0	67	0.606
24.001	1.040	114.9	28.3	1.820	2.949	0.285	0.0	126	0.866
24.002	1.042	115.1	33.2	2.949	3.295	0.341	0.0	137	0.905
25.000	0.921	36.6	7.4	1.300	1.628	0.071	0.0	68	0.722
25.001	0.922	36.7	9.5	1.628	1.442	0.095	0.0	78	0.776
25.002	2.389	95.0	19.2	1.441	1.380	0.193	0.0	68	1.878
24.003	1.043	115.2	60.3	3.295	3.923	0.645	0.0	193	1.055
24.004	1.041	115.0	65.3	3.923	4.286	0.712	0.0	203	1.073
24.005	1.187	131.1	68.5	4.286	4.579	0.759	0.0	192	1.199

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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)
26.000	KS10	KS11	30.707	0.600	21.624	21.470	0.154	199.4	225	5.56	38.9
24.006	KS11	KS14	31.352	0.600	19.466	19.361	0.105	298.6	450	8.44	32.5
27.000	KS12	KS14	9.136	0.600	19.360	19.361	-0.001	-9136.0	450	5.20	39.9
28.000	KS13	KS14	6.598	0.600	19.360	19.361	-0.001	-6598.0	450	5.15	40.1
24.007	KS14	KS17	39.443	0.600	19.361	19.230	0.131	301.1	450	9.00	31.5
29.000	KS15	KS17	48.939	0.600	19.425	19.230	0.195	251.0	450	5.64	38.7
30.000	KS16	KS17	42.462	0.600	21.637	21.425	0.212	200.3	450	5.49	39.1
1.020	SR 4	SR 5	31.224	0.600	19.110	18.880	0.230	135.8	450	12.79	26.5
31.000	SR 5.1	SR 5	2.940	0.600	18.880	18.880	0.000	0.0	450	5.07	40.3
1.021	SR 5	SR 6	36.497	0.600	18.880	18.697	0.183	199.4	450	13.21	26.0
1.022	SR 6	SR 7	9.007	0.600	18.697	18.652	0.045	200.2	450	13.32	25.9
1.023	SR 7	Ex.S 6	11.201	0.600	18.652	18.596	0.056	200.0	450	13.45	25.8
1.024	Ex.S 6	Ex.S 7	15.714	0.600	17.730	17.608	0.122	128.8	450	13.59	25.7
24.008	KS17	KS18	24.688	0.600	19.230	19.147	0.083	297.4	450	9.35	31.0
24.009	KS18	SR 4	11.108	0.600	19.147	19.110	0.037	300.2	450	9.51	30.7

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)
26.000	0.922	36.7	6.7	1.200	2.705	0.064	0.0	65	0.708
24.006	1.171	186.2	78.4	4.484	4.214	0.890	0.0	203	1.123
27.000	0.750	119.3	0.0	4.168	4.214	0.000	0.0	0	0.000
28.000	0.750	119.3	0.0	4.499	4.214	0.000	0.0	0	0.000
24.007	1.166	185.5	79.1	4.214	3.895	0.925	0.0	205	1.122
29.000	1.278	203.3	17.7	1.993	3.895	0.169	0.0	89	0.798
30.000	1.433	227.8	16.4	3.172	1.700	0.155	0.0	81	0.847
1.020	1.743	277.2	399.8	3.590	3.106	5.569	0.0	450	1.765
31.000	0.750	119.3	0.0	3.148	3.106	0.000	0.0	0	0.000
1.021	1.436	228.3	399.4	3.106	2.591	5.658	0.0	450	1.454
1.022	1.433	227.9	397.7	2.591	2.632	5.658	0.0	450	1.451
1.023	1.434	228.0	398.0	2.632	2.339	5.691	0.0	450	1.452
1.024	1.790	284.6	395.7	3.205	3.232	5.691	0.0	450	1.812
24.008	1.173	186.6	107.1	3.895	3.584	1.277	0.0	245	1.212
24.009	1.168	185.7	106.3	3.584	3.590	1.277	0.0	244	1.205

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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)
1.000	34.380	189.9	225	Circular	32.064	30.616	1.223	32.402	30.435	1.742
1.001	9.818	188.8	225	Circular	32.402	30.435	1.742	31.887	30.383	1.279
1.002	25.017	149.8	225	Circular	31.887	29.567	2.095	30.589	29.400	0.964
1.003	22.846	200.4	225	Circular	30.589	28.510	1.854	29.404	28.396	0.783
2.000	33.791	91.3	225	Circular	29.307	28.070	1.012	29.404	27.700	1.479
1.004	11.333	113.3	225	Circular	29.404	27.330	1.849	28.820	27.230	1.365
1.005	16.870	102.2	225	Circular	28.820	26.635	1.960	28.020	26.470	1.325
1.006	34.766	100.2	225	Circular	28.020	25.966	1.829	27.099	25.619	1.255
1.007	30.753	125.5	300	Circular	27.099	23.990	2.809	26.239	23.745	2.194
3.000	35.287	56.0	225	Circular	29.617	27.580	1.812	28.341	26.950	1.166
3.001	46.701	35.0	225	Circular	28.341	26.379	1.737	26.732	25.044	1.463
3.002	15.549	35.0	225	Circular	26.732	25.044	1.463	26.239	24.600	1.414
1.008	15.337	199.2	300	Circular	26.239	23.745	2.194	25.894	23.668	1.926
1.009	34.351	227.5	300	Circular	25.894	23.668	1.926	25.611	23.517	1.794
1.010	15.941	136.2	300	Circular	25.611	23.517	1.794	25.486	23.400	1.786
4.000	11.240	0.0	300	Circular	25.461	22.653	2.508	25.486	22.653	2.533
1.011	29.862	229.7	300	Circular	25.486	22.653	2.533	25.435	22.523	2.612
5.000	13.707	180.4	225	Circular	25.062	23.666	1.171	25.088	23.590	1.273
5.001	29.436	184.0	225	Circular	25.088	23.590	1.273	25.435	23.430	1.780
1.012	6.897	160.4	300	Circular	25.435	22.448	2.687	25.434	22.405	2.729
6.000	17.532	109.6	225	Circular	24.979	23.560	1.194	25.255	23.400	1.630
6.001	35.217	100.0	225	Circular	25.255	22.757	2.273	25.434	22.405	2.804
1.013	27.987	113.8	300	Circular	25.434	22.405	2.729	24.908	22.159	2.449
7.000	80.736	349.5	300	Circular	25.450	23.536	1.614	25.400	23.305	1.795
7.001	57.340	349.6	300	Circular	25.400	23.305	1.795	24.810	23.141	1.369

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	MQS 1	1350	Manhole	Adoptable	MQS 2	1350	Manhole	Adoptable
1.001	MQS 2	1350	Manhole	Adoptable	MQS 3	1200	Manhole	Adoptable
1.002	MQS 3	1200	Manhole	Adoptable	MQS 4	1200	Manhole	Adoptable
1.003	MQS 4	1200	Manhole	Adoptable	MQS 5	1200	Manhole	Adoptable
2.000	MQS 5.1	1350	Manhole	Adoptable	MQS 5	1200	Manhole	Adoptable
1.004	MQS 5	1200	Manhole	Adoptable	MQS 6	1200	Manhole	Adoptable
1.005	MQS 6	1200	Manhole	Adoptable	MQS 7	1200	Manhole	Adoptable
1.006	MQS 7	1200	Manhole	Adoptable	MQS 8	1200	Manhole	Adoptable
1.007	MQS 8	1200	Manhole	Adoptable	MQS 9	1200	Manhole	Adoptable
3.000	MQS 9.3	1200	Manhole	Adoptable	MQS 9.2	1200	Manhole	Adoptable
3.001	MQS 9.2	1200	Manhole	Adoptable	MQS 9.1	1350	Manhole	Adoptable
3.002	MQS 9.1	1350	Manhole	Adoptable	MQS 9	1200	Manhole	Adoptable
1.008	MQS 9	1200	Manhole	Adoptable	MQS 10	1200	Manhole	Adoptable
1.009	MQS 10	1200	Manhole	Adoptable	MQS 11	1200	Manhole	Adoptable
1.010	MQS 11	1200	Manhole	Adoptable	MQS 12	1200	Manhole	Adoptable
4.000	MQS 12.1	1350	Manhole	Adoptable	MQS 12	1200	Manhole	Adoptable
1.011	MQS 12	1200	Manhole	Adoptable	MQS 13	1200	Manhole	Adoptable
5.000	MQS 13.2	1350	Manhole	Adoptable	MQS 13.1	1350	Manhole	Adoptable
5.001	MQS 13.1	1350	Manhole	Adoptable	MQS 13	1200	Manhole	Adoptable
1.012	MQS 13	1200	Manhole	Adoptable	MQS 14	1200	Manhole	Adoptable
6.000	MQS 14.2	1350	Manhole	Adoptable	MQS 14.1	1350	Manhole	Adoptable
6.001	MQS 14.1	1350	Manhole	Adoptable	MQS 14	1200	Manhole	Adoptable
1.013	MQS 14	1200	Manhole	Adoptable	MQS 19	1200	Manhole	Adoptable
7.000	PS 1	1200	Manhole	Adoptable	PS 2	1200	Manhole	Adoptable
7.001	PS 2	1200	Manhole	Adoptable	PS 3	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)
7.002	31.218	350.8	300	Circular	24.810	23.141	1.369	25.392	23.052	2.040
7.003	24.495	322.3	300	Circular	25.392	23.052	2.040	25.455	22.976	2.179
8.000	3.704	3704.0	300	Circular	25.514	22.977	2.237	25.455	22.976	2.179
9.000	3.163	3163.0	300	Circular	25.342	22.977	2.065	25.455	22.976	2.179
7.004	12.244	161.1	300	Circular	25.455	22.976	2.179	25.363	22.900	2.163
10.000	13.683	108.6	225	Circular	25.749	23.806	1.718	25.363	23.680	1.458
7.005	31.572	80.3	300	Circular	25.363	22.900	2.163	24.472	22.507	1.665
7.006	39.709	199.5	300	Circular	24.472	22.507	1.665	24.728	22.308	2.120
7.007	28.829	200.2	300	Circular	24.728	22.308	2.120	24.908	22.164	2.444
1.014	29.359	201.1	300	Circular	24.908	22.159	2.449	25.041	22.013	2.728
1.015	32.439	103.6	300	Circular	25.041	22.013	2.728	25.104	21.700	3.104
1.016	10.125	198.5	300	Circular	25.104	21.700	3.104	24.997	21.649	3.048
11.000	18.011	150.1	300	Circular	25.486	22.653	2.533	25.355	22.533	2.522
11.001	24.589	149.9	300	Circular	25.355	22.533	2.522	25.229	22.369	2.560
11.002	22.768	149.8	300	Circular	25.229	22.369	2.560	25.206	22.217	2.689
11.003	25.947	137.3	300	Circular	25.206	22.217	2.689	25.213	22.028	2.885
12.000	23.021	45.0	225	Circular	26.233	24.212	1.796	25.213	23.700	1.288
11.004	29.536	163.2	300	Circular	25.213	22.028	2.885	25.018	21.847	2.871
13.000	18.664	200.7	225	Circular	25.299	23.593	1.481	25.018	23.500	1.293
11.005	15.147	150.0	300	Circular	25.018	21.750	2.968	24.997	21.649	3.048
1.017	22.184	199.9	450	Circular	24.997	21.649	2.898	25.228	21.538	3.240
14.000	40.597	100.2	225	Circular	27.514	25.850	1.439	26.967	25.445	1.297
14.001	24.787	100.4	225	Circular	26.967	25.445	1.297	26.755	25.198	1.332
14.002	40.462	145.5	225	Circular	26.755	25.198	1.332	26.405	24.920	1.260
14.003	23.668	99.9	300	Circular	26.405	24.137	1.968	25.514	23.900	1.314

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
7.002	PS 3	1200	Manhole	Adoptable	PS 4	1350	Manhole	Adoptable
7.003	PS 4	1350	Manhole	Adoptable	PS 5	1200	Manhole	Adoptable
8.000	PS 5.1	1350	Manhole	Adoptable	PS 5	1200	Manhole	Adoptable
9.000	PS 5.2	1350	Manhole	Adoptable	PS 5	1200	Manhole	Adoptable
7.004	PS 5	1200	Manhole	Adoptable	MQS 16	1200	Manhole	Adoptable
10.000	MQS 15	1350	Manhole	Adoptable	MQS 16	1200	Manhole	Adoptable
7.005	MQS 16	1200	Manhole	Adoptable	MQS 17	1200	Manhole	Adoptable
7.006	MQS 17	1200	Manhole	Adoptable	MQS 18	1200	Manhole	Adoptable
7.007	MQS 18	1200	Manhole	Adoptable	MQS 19	1200	Manhole	Adoptable
1.014	MQS 19	1200	Manhole	Adoptable	MQS 20	1350	Manhole	Adoptable
1.015	MQS 20	1350	Manhole	Adoptable	MQS 21	1200	Manhole	Adoptable
1.016	MQS 21	1200	Manhole	Adoptable	SR 1	1500	Manhole	Adoptable
11.000	MQS 12	1200	Manhole	Adoptable	MQS 22	1200	Manhole	Adoptable
11.001	MQS 22	1200	Manhole	Adoptable	MQS 23	1200	Manhole	Adoptable
11.002	MQS 23	1200	Manhole	Adoptable	MQS 24	1200	Manhole	Adoptable
11.003	MQS 24	1200	Manhole	Adoptable	MQS 25	1200	Manhole	Adoptable
12.000	MQS 25.1	1200	Manhole	Adoptable	MQS 25	1200	Manhole	Adoptable
11.004	MQS 25	1200	Manhole	Adoptable	MQS 26	1200	Manhole	Adoptable
13.000	MQS 26.1	1200	Manhole	Adoptable	MQS 26	1200	Manhole	Adoptable
11.005	MQS 26	1200	Manhole	Adoptable	SR 1	1500	Manhole	Adoptable
1.017	SR 1	1500	Manhole	Adoptable	SR 2	1500	Manhole	Adoptable
14.000	TS 1	1350	Manhole	Adoptable	TS 2	1350	Manhole	Adoptable
14.001	TS 2	1350	Manhole	Adoptable	TS 3	1350	Manhole	Adoptable
14.002	TS 3	1350	Manhole	Adoptable	TS 4	1350	Manhole	Adoptable
14.003	TS 4	1350	Manhole	Adoptable	TS 5	1350	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)
15.000	2.350	2350.0	300	Circular	25.638	24.086	1.252	25.514	24.085	1.129
14.004	65.990	200.0	300	Circular	25.514	23.900	1.314	25.844	23.570	1.974
16.000	35.401	87.6	225	Circular	27.422	25.729	1.468	27.312	25.325	1.762
17.000	23.640	60.0	225	Circular	28.107	26.294	1.588	27.312	25.900	1.187
16.001	36.093	123.2	225	Circular	27.312	25.093	1.994	26.232	24.800	1.207
16.002	18.831	200.3	225	Circular	26.232	24.394	1.613	25.844	24.300	1.319
14.005	37.475	200.4	300	Circular	25.844	23.570	1.974	26.546	23.383	2.863
14.006	34.861	199.2	300	Circular	26.546	23.383	2.863	26.284	23.208	2.776
18.000	13.333	199.0	300	Circular	29.339	27.315	1.724	29.561	27.248	2.013
18.001	17.229	200.3	300	Circular	29.561	27.248	2.013	29.660	27.162	2.198
18.002	51.037	200.1	300	Circular	29.660	27.162	2.198	28.724	26.907	1.517
18.003	44.678	154.1	300	Circular	28.724	26.907	1.517	28.173	26.617	1.256
18.004	9.943	51.8	300	Circular	28.173	26.617	1.256	27.960	26.425	1.235
19.000	44.433	150.1	225	Circular	29.428	27.796	1.407	29.047	27.500	1.322
19.001	18.009	202.3	225	Circular	29.047	27.189	1.633	28.525	27.100	1.200
20.000	2.068	2068.0	300	Circular	28.529	26.419	1.810	28.525	26.418	1.807
19.002	38.727	207.1	225	Circular	28.525	26.418	1.882	28.481	26.231	2.025
21.000	33.305	76.4	225	Circular	29.293	26.667	2.401	28.481	26.231	2.025
19.003	21.272	151.9	225	Circular	28.481	26.231	2.025	28.215	26.091	1.899
19.004	7.945	130.2	225	Circular	28.215	26.091	1.899	27.960	26.030	1.705
18.005	33.418	154.0	300	Circular	27.960	25.517	2.143	26.817	25.300	1.217
22.000	4.778	0.0	300	Circular	26.987	25.098	1.589	26.817	25.098	1.419
18.006	10.996	137.5	225	Circular	26.817	25.098	1.494	26.585	25.018	1.342
18.007	30.557	93.2	225	Circular	26.585	25.018	1.342	26.284	24.690	1.369
14.007	21.820	200.2	300	Circular	26.284	23.208	2.776	26.102	23.099	2.703

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
15.000	TS 5.1	1350	Manhole	Adoptable	TS 5	1350	Manhole	Adoptable
14.004	TS 5	1350	Manhole	Adoptable	TS 13	1200	Manhole	Adoptable
16.000	TS 28	1350	Manhole	Adoptable	TS 10	1200	Manhole	Adoptable
17.000	TS 9	1200	Manhole	Adoptable	TS 10	1200	Manhole	Adoptable
16.001	TS 10	1200	Manhole	Adoptable	TS 12	1200	Manhole	Adoptable
16.002	TS 12	1200	Manhole	Adoptable	TS 13	1200	Manhole	Adoptable
14.005	TS 13	1200	Manhole	Adoptable	TS 14	1200	Manhole	Adoptable
14.006	TS 14	1200	Manhole	Adoptable	TS 32	1200	Manhole	Adoptable
18.000	TS 15	1350	Manhole	Adoptable	TS 16	1350	Manhole	Adoptable
18.001	TS 16	1350	Manhole	Adoptable	TS 17	1350	Manhole	Adoptable
18.002	TS 17	1350	Manhole	Adoptable	TS 18	1200	Manhole	Adoptable
18.003	TS 18	1200	Manhole	Adoptable	TS 19	1350	Manhole	Adoptable
18.004	TS 19	1350	Manhole	Adoptable	TS 25	1200	Manhole	Adoptable
19.000	TS 20	1350	Manhole	Adoptable	TS 21	1350	Manhole	Adoptable
19.001	TS 21	1350	Manhole	Adoptable	TS 22	1200	Manhole	Adoptable
20.000	TS 22.1	1200	Manhole	Adoptable	TS 22	1200	Manhole	Adoptable
19.002	TS 22	1200	Manhole	Adoptable	TS 23	1200	Manhole	Adoptable
21.000	TS 23.1	1200	Manhole	Adoptable	TS 23	1200	Manhole	Adoptable
19.003	TS 23	1200	Manhole	Adoptable	TS 24	1200	Manhole	Adoptable
19.004	TS 24	1200	Manhole	Adoptable	TS 25	1200	Manhole	Adoptable
18.005	TS 25	1200	Manhole	Adoptable	TS 26	1350	Manhole	Adoptable
22.000	TS 26.1	1350	Manhole	Adoptable	TS 26	1350	Manhole	Adoptable
18.006	TS 26	1350	Manhole	Adoptable	TS 31	1200	Manhole	Adoptable
18.007	TS 31	1200	Manhole	Adoptable	TS 32	1200	Manhole	Adoptable
14.007	TS 32	1200	Manhole	Adoptable	AS 13	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)
23.000	55.311	96.2	225	Circular	26.733	25.050	1.458	26.102	24.475	1.402
14.008	55.810	200.0	300	Circular	26.102	23.099	2.703	25.228	22.820	2.108
1.018	46.969	307.0	450	Circular	25.228	21.538	3.240	23.993	21.385	2.158
1.019	32.252	99.9	450	Circular	23.993	19.433	4.110	23.150	19.110	3.590
24.000	23.871	302.2	375	Circular	21.746	20.096	1.275	22.212	20.017	1.820
24.001	65.719	300.1	375	Circular	22.212	20.017	1.820	23.122	19.798	2.949
24.002	18.851	299.2	375	Circular	23.122	19.798	2.949	23.405	19.735	3.295
25.000	39.171	199.9	225	Circular	24.734	23.209	1.300	24.866	23.013	1.628
25.001	25.707	199.3	225	Circular	24.866	23.013	1.628	24.551	22.884	1.442
25.002	32.759	30.2	225	Circular	24.551	22.885	1.441	23.405	21.800	1.380
24.003	40.602	298.5	375	Circular	23.405	19.735	3.295	23.897	19.599	3.923
24.004	20.978	299.7	375	Circular	23.897	19.599	3.923	24.190	19.529	4.286
24.005	19.197	231.3	375	Circular	24.190	19.529	4.286	24.400	19.446	4.579
26.000	30.707	199.4	225	Circular	23.049	21.624	1.200	24.400	21.470	2.705
24.006	31.352	298.6	450	Circular	24.400	19.466	4.484	24.025	19.361	4.214
27.000	9.136	-9136.0	450	Circular	23.978	19.360	4.168	24.025	19.361	4.214
28.000	6.598	-6598.0	450	Circular	24.309	19.360	4.499	24.025	19.361	4.214
24.007	39.443	301.1	450	Circular	24.025	19.361	4.214	23.575	19.230	3.895
29.000	48.939	251.0	450	Circular	21.868	19.425	1.993	23.575	19.230	3.895
30.000	42.462	200.3	450	Circular	25.259	21.637	3.172	23.575	21.425	1.700
1.020	31.224	135.8	450	Circular	23.150	19.110	3.590	22.436	18.880	3.106
31.000	2.940	0.0	450	Circular	22.478	18.880	3.148	22.436	18.880	3.106
1.021	36.497	199.4	450	Circular	22.436	18.880	3.106	21.738	18.697	2.591
1.022	9.007	200.2	450	Circular	21.738	18.697	2.591	21.734	18.652	2.632

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
23.000	AS 13.1	1200	Manhole	Adoptable	AS 13	1200	Manhole	Adoptable
14.008	AS 13	1200	Manhole	Adoptable	SR 2	1500	Manhole	Adoptable
1.018	SR 2	1500	Manhole	Adoptable	SR 3	1500	Manhole	Adoptable
1.019	SR 3	1500	Manhole	Adoptable	SR 4	1500	Manhole	Adoptable
24.000	KS1	1350	Manhole	Adoptable	KS2	1200	Manhole	Adoptable
24.001	KS2	1200	Manhole	Adoptable	KS3	1200	Manhole	Adoptable
24.002	KS3	1200	Manhole	Adoptable	KS7	1200	Manhole	Adoptable
25.000	KS4	1350	Manhole	Adoptable	KS5	1200	Manhole	Adoptable
25.001	KS5	1200	Manhole	Adoptable	KS6	1350	Manhole	Adoptable
25.002	KS6	1350	Manhole	Adoptable	KS7	1200	Manhole	Adoptable
24.003	KS7	1200	Manhole	Adoptable	KS8	1200	Manhole	Adoptable
24.004	KS8	1200	Manhole	Adoptable	KS9	1200	Manhole	Adoptable
24.005	KS9	1200	Manhole	Adoptable	KS11	1350	Manhole	Adoptable
26.000	KS10	1350	Manhole	Adoptable	KS11	1350	Manhole	Adoptable
24.006	KS11	1350	Manhole	Adoptable	KS14	1500	Manhole	Adoptable
27.000	KS12	1350	Manhole	Adoptable	KS14	1500	Manhole	Adoptable
28.000	KS13	1350	Manhole	Adoptable	KS14	1500	Manhole	Adoptable
24.007	KS14	1500	Manhole	Adoptable	KS17	1500	Manhole	Adoptable
29.000	KS15	1350	Manhole	Adoptable	KS17	1500	Manhole	Adoptable
30.000	KS16	1200	Manhole	Adoptable	KS17	1500	Manhole	Adoptable
1.020	SR 4	1500	Manhole	Adoptable	SR 5	1500	Manhole	Adoptable
31.000	SR 5.1	1350	Manhole	Adoptable	SR 5	1500	Manhole	Adoptable
1.021	SR 5	1500	Manhole	Adoptable	SR 6	1800	Manhole	Adoptable
1.022	SR 6	1800	Manhole	Adoptable	SR 7	1800	Manhole	Adoptable

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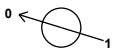
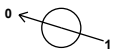
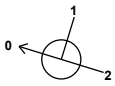
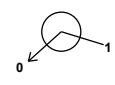
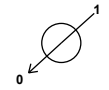
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Pipeline Schedule

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)
1.023	11.201	200.0	450	Circular	21.734	18.652	2.632	21.385	18.596	2.339
1.024	15.714	128.8	450	Circular	21.385	17.730	3.205	21.290	17.608	3.232
24.008	24.688	297.4	450	Circular	23.575	19.230	3.895	23.181	19.147	3.584
24.009	11.108	300.2	450	Circular	23.181	19.147	3.584	23.150	19.110	3.590

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.023	SR 7	1800	Manhole	Adoptable	Ex.S 6	1350	Manhole	Adoptable
1.024	Ex.S 6	1350	Manhole	Adoptable	Ex.S 7	1350	Manhole	Adoptable
24.008	KS17	1500	Manhole	Adoptable	KS18	1350	Manhole	Adoptable
24.009	KS18	1350	Manhole	Adoptable	SR 4	1500	Manhole	Adoptable

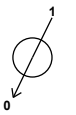
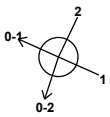
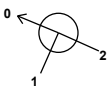
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MQS 1	526940.117	724922.095	32.064	1.448	1350		0	1.000	30.616	225
MQS 2	526929.699	724889.332	32.402	1.967	1350		1	1.000	30.435	225
							0	1.001	30.435	225
MQS 3	526920.314	724892.216	31.887	2.620	1200		1	1.001	30.383	225
							0	1.002	29.567	225
MQS 4	526896.401	724899.565	30.589	2.379	1200		1	1.002	29.400	225
							0	1.003	28.510	225
MQS 5.1	526884.457	724938.587	29.307	1.237	1350		0	2.000	28.070	225
MQS 5	526874.563	724906.276	29.404	2.374	1200		1	2.000	27.700	225
							2	1.003	28.396	225
							0	1.004	27.330	225
MQS 6	526863.730	724909.605	28.820	2.185	1200		1	1.004	27.230	225
							0	1.005	26.635	225
MQS 7	526851.181	724898.332	28.020	2.054	1200		1	1.005	26.470	225
							0	1.006	25.966	225

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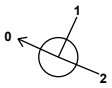
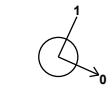
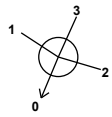
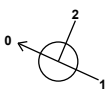
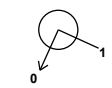
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MQS 8	526825.514	724874.882	27.099	3.109	1200		1	1.006	25.619	225
							0	1.007	23.990	300
MQS 9.3	526871.810	724859.107	29.617	2.037	1200		0	3.000	27.580	225
MQS 9.2	526859.496	724826.038	28.341	1.962	1200		1	3.000	26.950	225
							0	3.001	26.379	225
MQS 9.1	526815.588	724841.948	26.732	1.688	1350		1	3.001	25.044	225
							0	3.002	25.044	225
MQS 9	526804.288	724852.628	26.239	2.494	1200		1	3.002	24.600	225
							2	1.007	23.745	300
							0	1.008	23.745	300
MQS 10	526795.087	724840.358	25.894	2.226	1200		1	1.008	23.668	300
							0	1.009	23.668	300
MQS 11	526779.892	724809.550	25.611	2.094	1200		1	1.009	23.517	300
							0	1.010	23.517	300
MQS 12.1	526783.259	724790.611	25.461	2.808	1350		0	4.000	22.653	300
MQS 12	526772.990	724795.181	25.486	3.133	1200		1	4.000	22.653	300
							2	1.010	23.400	300
							0-1	1.011	22.653	300
							0-2	11.000	22.653	300
MQS 13.2	526746.327	724774.776	25.062	1.396	1350		0	5.000	23.666	225
MQS 13.1	526733.862	724780.477	25.088	1.498	1350		1	5.000	23.590	225
							0	5.001	23.590	225
MQS 13	526745.746	724807.407	25.435	2.987	1200		1	5.001	23.430	225
							2	1.011	22.523	300
							0	1.012	22.448	300
MQS 14.2	526770.160	724834.761	24.979	1.419	1350		0	6.000	23.560	225

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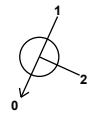
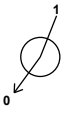
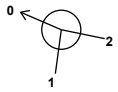
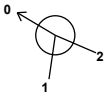
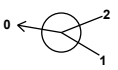
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MQS 14.1	526754.188	724841.990	25.255	2.498	1350		1	6.000	23.400	225
							0	6.001	22.757	225
MQS 14	526739.372	724810.041	25.434	3.029	1200		1	6.001	22.405	225
							2	1.012	22.405	300
							0	1.013	22.405	300
PS 1	526855.290	724937.094	25.450	1.914	1200		0	7.000	23.536	300
PS 2	526781.245	724969.274	25.400	2.095	1200		1	7.000	23.305	300
							0	7.001	23.305	300
PS 3	526757.183	724917.227	24.810	1.969	1200		1	7.001	23.141	300
							0	7.002	23.141	300
PS 4	526785.711	724904.550	25.392	2.340	1350		1	7.002	23.052	300
							0	7.003	23.052	300
PS 5.1	526779.175	724881.181	25.514	2.537	1350		0	8.000	22.977	300
PS 5.2	526772.972	724883.956	25.342	2.365	1350		0	9.000	22.977	300
PS 5	526775.622	724882.229	25.455	2.779	1200		1	9.000	22.976	300
							2	8.000	22.976	300
							3	7.003	22.976	300
							0	7.004	22.976	300
MQS 15	526783.348	724865.256	25.749	1.943	1350		0	10.000	23.806	225
MQS 16	526770.898	724870.933	25.363	2.463	1200		1	10.000	23.680	225
							2	7.004	22.900	300
							0	7.005	22.900	300
MQS 17	526742.179	724884.048	24.472	1.965	1200		1	7.005	22.507	300
							0	7.006	22.507	300
MQS 18	526725.790	724847.878	24.728	2.420	1200		1	7.006	22.308	300
							0	7.007	22.308	300

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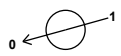
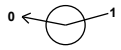
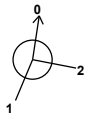
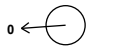
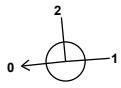
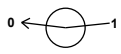
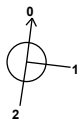
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MQS 19	526713.892	724821.619	24.908	2.749	1200		1	7.007	22.164	300
							2	1.013	22.159	300
							0	1.014	22.159	300
MQS 20	526701.775	724794.877	25.041	3.028	1350		1	1.014	22.013	300
							0	1.015	22.013	300
MQS 21	526688.760	724765.164	25.104	3.404	1200		1	1.015	21.700	300
							0	1.016	21.700	300
MQS 22	526767.366	724778.071	25.355	2.822	1200		1	11.000	22.533	300
							0	11.001	22.533	300
MQS 23	526758.324	724755.205	25.229	2.860	1200		1	11.001	22.369	300
							0	11.002	22.369	300
MQS 24	526744.910	724736.809	25.206	2.989	1200		1	11.002	22.217	300
							0	11.003	22.217	300
MQS 25.1	526716.396	724719.208	26.233	2.021	1200		0	12.000	24.212	225
MQS 25	526719.492	724742.019	25.213	3.185	1200		1	12.000	23.700	225
							2	11.003	22.028	300
							0	11.004	22.028	300
MQS 26.1	526689.702	724735.233	25.299	1.706	1200		0	13.000	23.593	225
MQS 26	526692.366	724753.706	25.018	3.268	1200		1	13.000	23.500	225
							2	11.004	21.847	300
							0	11.005	21.750	300
SR 1	526679.344	724761.441	24.997	3.348	1500		1	11.005	21.649	300
							2	1.016	21.649	300
							0	1.017	21.649	450
TS 1	526705.451	724604.310	27.514	1.664	1350		0	14.000	25.850	225
TS 2	526712.783	724564.380	26.967	1.522	1350		1	14.000	25.445	225
							0	14.001	25.445	225

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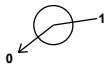
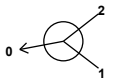
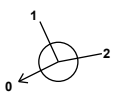
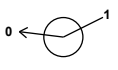
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
TS 3	526688.909	724557.716	26.755	1.557	1350		1	14.001	25.198	225
							0	14.002	25.198	225
TS 4	526649.887	724547.018	26.405	2.268	1350		1	14.002	24.920	225
							0	14.003	24.137	300
TS 5.1	526625.740	724549.343	25.638	1.552	1350		0	15.000	24.086	300
TS 5	526626.649	724551.510	25.514	1.914	1350		1	15.000	24.085	300
							2	14.003	23.900	300
							0	14.004	23.900	300
TS 28	526687.757	724653.511	27.422	1.693	1350		0	16.000	25.729	225
TS 9	526714.700	724619.967	28.107	1.813	1200		0	17.000	26.294	225
TS 10	526691.121	724618.270	27.312	2.219	1200		1	17.000	25.900	225
							2	16.000	25.325	225
							0	16.001	25.093	225
TS 12	526655.224	724614.516	26.232	1.838	1200		1	16.001	24.800	225
							0	16.002	24.394	225
TS 13	526636.526	724616.756	25.844	2.274	1200		1	16.002	24.300	225
							2	14.004	23.570	300
							0	14.005	23.570	300
TS 14	526641.254	724653.932	26.546	3.163	1200		1	14.005	23.383	300
							0	14.006	23.383	300
TS 15	526797.014	724630.595	29.339	2.024	1350		0	18.000	27.315	300
TS 16	526795.746	724643.868	29.561	2.313	1350		1	18.000	27.248	300
							0	18.001	27.248	300
TS 17	526787.961	724659.238	29.660	2.498	1350		1	18.001	27.162	300
							0	18.002	27.162	300

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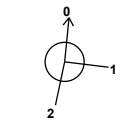
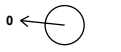
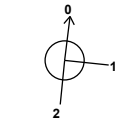
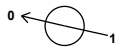
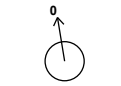
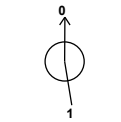
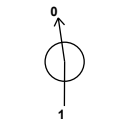
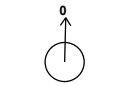
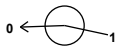
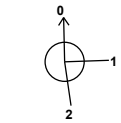
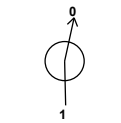
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
TS 18	526773.501	724708.184	28.724	1.817	1200		1	18.002	26.907	300
							0	18.003	26.907	300
TS 19	526729.322	724701.526	28.173	1.556	1350		1	18.003	26.617	300
							0	18.004	26.617	300
TS 20	526787.260	724620.199	29.428	1.632	1350		0	19.000	27.796	225
TS 21	526743.042	724615.832	29.047	1.858	1350		1	19.000	27.500	225
							0	19.001	27.189	225
TS 22.1	526731.672	724629.251	28.529	2.110	1200		0	20.000	26.419	300
TS 22	526733.036	724630.805	28.525	2.407	1200		1	20.000	26.418	300
							2	19.001	27.100	225
							0	19.002	26.418	225
TS 23.1	526763.113	724672.140	29.293	2.626	1200		0	21.000	26.667	225
TS 23	526729.921	724669.407	28.481	2.250	1200		1	21.000	26.231	225
							2	19.002	26.231	225
							0	19.003	26.231	225
TS 24	526727.798	724690.572	28.215	2.124	1200		1	19.003	26.091	225
							0	19.004	26.091	225
TS 25	526721.490	724695.402	27.960	2.443	1200		1	19.004	26.030	225
							2	18.004	26.425	300
							0	18.005	25.517	300
TS 26.1	526686.659	724693.562	26.987	1.889	1350		0	22.000	25.098	300
TS 26	526688.649	724689.219	26.817	2.019	1350		1	22.000	25.098	300
							2	18.005	25.300	300
							0	18.006	25.098	225
TS 31	526678.808	724684.312	26.585	1.567	1200		1	18.006	25.018	225
							0	18.007	25.018	225

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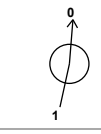
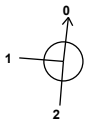
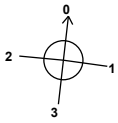
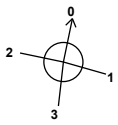
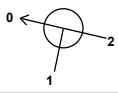
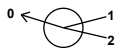
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
TS 32	526648.479	724688.035	26.284	3.076	1200		1	18.007	24.690	225
							2	14.006	23.208	300
							0	14.007	23.208	300
AS 13.1	526705.656	724703.981	26.733	1.683	1200		0	23.000	25.050	225
AS 13	526650.646	724709.747	26.102	3.003	1200		1	23.000	24.475	225
							2	14.007	23.099	300
							0	14.008	23.099	300
SR 2	526657.470	724765.138	25.228	3.690	1500		1	14.008	22.820	300
							2	1.017	21.538	450
							0	1.018	21.538	450
SR 3	526611.596	724775.223	23.993	4.560	1500		1	1.018	21.385	450
							0	1.019	19.433	450
KS1	526566.022	724488.980	21.746	1.950	1350		0	24.000	20.096	375
KS2	526562.168	724512.538	22.212	2.195	1200		1	24.000	20.017	375
							0	24.001	20.017	375
KS3	526562.528	724578.255	23.122	3.324	1200		1	24.001	19.798	375
							0	24.002	19.798	375
KS4	526616.708	724553.497	24.734	1.525	1350		0	25.000	23.209	225
KS5	526617.687	724592.655	24.866	1.853	1200		1	25.000	23.013	225
							0	25.001	23.013	225
KS6	526592.549	724598.033	24.551	1.667	1350		1	25.001	22.884	225
							0	25.002	22.885	225
KS7	526559.809	724596.909	23.405	3.670	1200		1	25.002	21.800	225
							2	24.002	19.735	375
							0	24.003	19.735	375
KS8	526558.873	724637.500	23.897	4.298	1200		1	24.003	19.599	375
							0	24.004	19.599	375

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
KS9	526563.358	724657.993	24.190	4.661	1200		1	24.004	19.529	375
							0	24.005	19.529	375
KS10	526534.275	724679.556	23.049	1.425	1350		0	26.000	21.624	225
KS11	526564.886	724677.130	24.400	4.954	1350		1	26.000	21.470	225
							2	24.005	19.446	375
							0	24.006	19.466	450
KS12	526559.340	724709.133	23.978	4.618	1350		0	27.000	19.360	450
KS13	526574.971	724707.374	24.309	4.949	1350		0	28.000	19.360	450
KS14	526568.436	724708.280	24.025	4.964	1500		1	28.000	19.361	450
							2	27.000	19.361	450
							3	24.006	19.361	450
							0	24.007	19.361	450
KS15	526524.990	724757.438	21.868	2.443	1350		0	29.000	19.425	450
KS16	526613.742	724735.846	25.259	3.622	1200		0	30.000	21.637	450
KS17	526572.902	724747.469	23.575	4.345	1500		1	30.000	21.425	450
							2	29.000	19.230	450
							3	24.007	19.230	450
							0	24.008	19.230	450
SR 4	526580.180	724782.517	23.150	4.040	1500		1	24.009	19.110	450
							2	1.019	19.110	450
							0	1.020	19.110	450
SR 5.1	526552.611	724790.316	22.478	3.598	1350		0	31.000	18.880	450
SR 5	526549.766	724789.579	22.436	3.856	1500		1	31.000	18.880	450
							2	1.020	18.880	450
							0	1.021	18.880	450
SR 6	526514.900	724800.369	21.738	3.041	1800		1	1.021	18.697	450
							0	1.022	18.697	450

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SR 7	526512.464	724809.040	21.734	3.382	1800	1	1.022	18.652	450
						0	1.023	18.652	450
Ex.S 6	526501.274	724809.544	21.385	3.655	1350	1	1.023	18.596	450
						0	1.024	17.730	450
Ex.S 7	526489.319	724819.743	21.290	3.682	1350	1	1.024	17.608	450
KS18	526577.922	724771.641	23.181	4.334	1350	1	24.008	19.147	450
						0	24.009	19.147	450

Node MQS 3 Online Orifice Control

Flap Valve	x	Invert Level (m)	29.567	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.100		

Node MQS 4 Online Orifice Control

Flap Valve	x	Invert Level (m)	28.510	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.100		

Node MQS 5 Online Orifice Control

Flap Valve	x	Invert Level (m)	27.330	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.100		

Node MQS 12 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	22.653	Product Number	CTL-SHE-0062-2000-1400-2000
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node PS 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	22.976	Product Number	CTL-SHE-0070-2000-0800-2000
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

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Node TS 24 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	26.091	Product Number	CTL-SHE-0061-1500-0800-1500
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.5	Min Node Diameter (mm)	1200

Node TS 26 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	25.098	Product Number	CTL-SHE-0092-3500-0800-3500
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

Node SR 7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	18.652	Product Number	CTL-SHE-0332-6500-0800-6500
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.375
Design Flow (l/s)	65.0	Min Node Diameter (mm)	1800

Node MQS 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	27.330
Side Inf Coefficient (m/hr)	0.30000	Porosity	0.43	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	49.6	0.0	1.000	50.1	0.0	1.600	50.1	0.0	1.601	0.0	0.0

Node MQS 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	28.510
Side Inf Coefficient (m/hr)	0.30000	Porosity	0.43	Time to half empty (mins)	10

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	49.5	0.0	1.000	50.0	0.0	1.600	50.0	0.0	1.601	0.0	0.0

Node MQS 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	28.567
Side Inf Coefficient (m/hr)	0.30000	Porosity	0.43	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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	49.4	0.0	1.200	49.9	0.0	1.900	49.9	0.0	1.901	0.0	0.0

Node MQS 12.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	22.653
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	0

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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	1.400	526.6	0.0	1.401	0.0	0.0

Node SR 5.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.880
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	187.8	0.0	2.000	189.7	0.0	2.001	0.0	0.0

Node TS 26.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	25.098
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	363.4	0.0	1.000	364.6	0.0	1.001	0.0	0.0

Node TS 5.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	24.086
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	2

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	142.1	0.0	1.000	142.6	0.0	1.001	0.0	0.0

Node TS 22.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	26.419
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	201.6	0.0	1.000	202.3	0.0	1.001	0.0	0.0

Node PS 5.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	22.977
Side Inf Coefficient (m/hr)	0.35000	Porosity	0.95	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	594.5	0.0	1.200	595.5	0.0	1.201	0.0	0.0

Node PS 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	23.141
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	0

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Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	722.6	0.0	1.200	723.7	0.0	1.201	0.0	0.0

Node KS13 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	19.361
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	326.5	0.0	1.000	326.5	0.0	1.400	326.5	0.0	1.401	0.0	0.0

Node KS12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	19.361
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	388.9	0.0	1.000	389.8	0.0	1.400	389.8	0.0	1.401	0.0	0.0

Node KS1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	20.096
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	6

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	23.0	0.0	0.600	23.0	0.0	0.601	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	86.031	24.344
1 year 15 minute winter	60.372	24.344
1 year 30 minute summer	57.849	16.369
1 year 30 minute winter	40.596	16.369
1 year 60 minute summer	40.255	10.638
1 year 60 minute winter	26.745	10.638
1 year 120 minute summer	25.681	6.787
1 year 120 minute winter	17.062	6.787
1 year 180 minute summer	20.185	5.194
1 year 180 minute winter	13.121	5.194
1 year 240 minute summer	16.242	4.292
1 year 240 minute winter	10.791	4.292
1 year 360 minute summer	12.738	3.278
1 year 360 minute winter	8.280	3.278
1 year 480 minute summer	10.241	2.706
1 year 480 minute winter	6.804	2.706
1 year 600 minute summer	8.517	2.330
1 year 600 minute winter	5.819	2.330
1 year 720 minute summer	7.690	2.061
1 year 720 minute winter	5.168	2.061
1 year 960 minute summer	6.452	1.699

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 960 minute winter	4.274	1.699
1 year 1440 minute summer	4.857	1.302
1 year 1440 minute winter	3.264	1.302
1 year 2160 minute summer	3.579	0.989
1 year 2160 minute winter	2.466	0.989
1 year 2880 minute summer	3.037	0.814
1 year 2880 minute winter	2.041	0.814
1 year 4320 minute summer	2.365	0.618
1 year 4320 minute winter	1.557	0.618
1 year 5760 minute summer	1.988	0.509
1 year 5760 minute winter	1.287	0.509
1 year 7200 minute summer	1.716	0.438
1 year 7200 minute winter	1.107	0.438
1 year 8640 minute summer	1.517	0.387
1 year 8640 minute winter	0.979	0.387
1 year 10080 minute summer	1.367	0.349
1 year 10080 minute winter	0.882	0.349
30 year +10% CC 15 minute summer	210.081	59.446
30 year +10% CC 15 minute winter	147.425	59.446
30 year +10% CC 30 minute summer	141.587	40.064
30 year +10% CC 30 minute winter	99.359	40.064
30 year +10% CC 60 minute summer	97.193	25.685
30 year +10% CC 60 minute winter	64.573	25.685
30 year +10% CC 120 minute summer	60.652	16.029
30 year +10% CC 120 minute winter	40.296	16.029
30 year +10% CC 180 minute summer	46.946	12.081
30 year +10% CC 180 minute winter	30.516	12.081
30 year +10% CC 240 minute summer	37.314	9.861
30 year +10% CC 240 minute winter	24.790	9.861
30 year +10% CC 360 minute summer	28.736	7.395
30 year +10% CC 360 minute winter	18.679	7.395
30 year +10% CC 480 minute summer	22.784	6.021
30 year +10% CC 480 minute winter	15.137	6.021
30 year +10% CC 600 minute summer	18.760	5.131
30 year +10% CC 600 minute winter	12.818	5.131
30 year +10% CC 720 minute summer	16.797	4.502
30 year +10% CC 720 minute winter	11.288	4.502
30 year +10% CC 960 minute summer	13.899	3.660
30 year +10% CC 960 minute winter	9.207	3.660
30 year +10% CC 1440 minute summer	10.194	2.732
30 year +10% CC 1440 minute winter	6.851	2.732
30 year +10% CC 2160 minute summer	7.377	2.039
30 year +10% CC 2160 minute winter	5.083	2.039
30 year +10% CC 2880 minute summer	6.180	1.656
30 year +10% CC 2880 minute winter	4.153	1.656
30 year +10% CC 4320 minute summer	4.724	1.235
30 year +10% CC 4320 minute winter	3.111	1.235
30 year +10% CC 5760 minute summer	3.916	1.003
30 year +10% CC 5760 minute winter	2.535	1.003
30 year +10% CC 7200 minute summer	3.342	0.853
30 year +10% CC 7200 minute winter	2.157	0.853
30 year +10% CC 8640 minute summer	2.927	0.747

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year +10% CC 8640 minute winter	1.889	0.747
30 year +10% CC 10080 minute summer	2.616	0.667
30 year +10% CC 10080 minute winter	1.688	0.667
100 year +20% CC 15 minute summer	296.897	84.012
100 year +20% CC 15 minute winter	208.349	84.012
100 year +20% CC 30 minute summer	201.507	57.019
100 year +20% CC 30 minute winter	141.408	57.019
100 year +20% CC 60 minute summer	138.007	36.471
100 year +20% CC 60 minute winter	91.688	36.471
100 year +20% CC 120 minute summer	85.551	22.609
100 year +20% CC 120 minute winter	56.838	22.609
100 year +20% CC 180 minute summer	65.898	16.958
100 year +20% CC 180 minute winter	42.835	16.958
100 year +20% CC 240 minute summer	52.169	13.787
100 year +20% CC 240 minute winter	34.660	13.787
100 year +20% CC 360 minute summer	39.949	10.280
100 year +20% CC 360 minute winter	25.968	10.280
100 year +20% CC 480 minute summer	31.537	8.334
100 year +20% CC 480 minute winter	20.953	8.334
100 year +20% CC 600 minute summer	25.877	7.078
100 year +20% CC 600 minute winter	17.681	7.078
100 year +20% CC 720 minute summer	23.101	6.191
100 year +20% CC 720 minute winter	15.525	6.191
100 year +20% CC 960 minute summer	19.026	5.010
100 year +20% CC 960 minute winter	12.603	5.010
100 year +20% CC 1440 minute summer	13.860	3.715
100 year +20% CC 1440 minute winter	9.315	3.715
100 year +20% CC 2160 minute summer	9.962	2.753
100 year +20% CC 2160 minute winter	6.864	2.753
100 year +20% CC 2880 minute summer	8.306	2.226
100 year +20% CC 2880 minute winter	5.582	2.226
100 year +20% CC 4320 minute summer	6.306	1.649
100 year +20% CC 4320 minute winter	4.152	1.649
100 year +20% CC 5760 minute summer	5.200	1.331
100 year +20% CC 5760 minute winter	3.366	1.331
100 year +20% CC 7200 minute summer	4.418	1.127
100 year +20% CC 7200 minute winter	2.852	1.127
100 year +20% CC 8640 minute summer	3.856	0.984
100 year +20% CC 8640 minute winter	2.489	0.984
100 year +20% CC 10080 minute summer	3.436	0.877
100 year +20% CC 10080 minute winter	2.218	0.877

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MQS 1	10	30.729	0.113	18.4	0.1612	0.0000	OK
15 minute winter	MQS 2	11	30.559	0.124	19.7	0.1778	0.0000	OK
360 minute winter	MQS 3	224	29.650	0.083	4.2	23.1998	0.0000	OK
360 minute winter	MQS 4	232	28.603	0.093	3.7	2.0755	0.0000	OK
15 minute winter	MQS 5.1	11	28.117	0.047	5.2	0.0666	0.0000	OK
30 minute winter	MQS 5	24	27.443	0.113	7.3	2.5330	0.0000	OK
30 minute winter	MQS 6	21	26.695	0.060	7.5	0.0676	0.0000	OK
15 minute winter	MQS 7	11	26.050	0.084	14.7	0.0946	0.0000	OK
15 minute winter	MQS 8	11	24.081	0.091	20.3	0.1031	0.0000	OK
15 minute winter	MQS 9.3	10	27.626	0.046	6.5	0.0525	0.0000	OK
15 minute winter	MQS 9.2	10	26.437	0.058	12.9	0.0652	0.0000	OK
15 minute winter	MQS 9.1	11	25.107	0.063	14.2	0.0907	0.0000	OK
15 minute winter	MQS 9	11	23.902	0.157	35.5	0.1780	0.0000	OK
15 minute winter	MQS 10	11	23.835	0.167	41.1	0.1890	0.0000	OK
15 minute winter	MQS 11	11	23.676	0.159	46.8	0.1803	0.0000	OK
1440 minute winter	MQS 12.1	930	22.694	0.041	1.2	20.6117	0.0000	OK
15 minute winter	MQS 12	12	22.817	0.164	49.5	0.1858	0.0000	OK
15 minute winter	MQS 13.2	10	23.733	0.067	7.6	0.0956	0.0000	OK
15 minute winter	MQS 13.1	11	23.700	0.110	17.9	0.1573	0.0000	OK
15 minute winter	MQS 13	11	22.563	0.115	19.0	0.1298	0.0000	OK
15 minute winter	MQS 14.2	10	23.628	0.068	9.4	0.0976	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 winter	MQS 1	1.000	MQS 2	18.1	0.864	0.482	0.7199	
15 minute winter	MQS 2	1.001	MQS 3	19.6	0.919	0.519	0.2092	
360 minute winter	MQS 3	1.002	MQS 4	3.0	0.616	0.070	0.1213	
360 minute winter	MQS 3	Infiltration		0.0				
360 minute winter	MQS 4	1.003	MQS 5	3.5	0.581	0.095	0.1373	
360 minute winter	MQS 4	Infiltration		0.0				
15 minute winter	MQS 5.1	2.000	MQS 5	5.0	0.857	0.092	0.1980	
30 minute winter	MQS 5	1.004	MQS 6	5.2	0.784	0.106	0.0747	
30 minute winter	MQS 5	Infiltration		0.0				
30 minute winter	MQS 6	1.005	MQS 7	7.4	0.906	0.145	0.1384	
15 minute winter	MQS 7	1.006	MQS 8	14.7	1.115	0.283	0.4576	
15 minute winter	MQS 8	1.007	MQS 9	20.3	0.741	0.205	0.8532	
15 minute winter	MQS 9.3	3.000	MQS 9.2	6.3	1.090	0.091	0.2053	
15 minute winter	MQS 9.2	3.001	MQS 9.1	12.8	1.502	0.145	0.4003	
15 minute winter	MQS 9.1	3.002	MQS 9	14.1	1.591	0.160	0.1382	
15 minute winter	MQS 9	1.008	MQS 10	35.4	0.911	0.451	0.5961	
15 minute winter	MQS 10	1.009	MQS 11	40.7	1.040	0.555	1.3456	
15 minute winter	MQS 11	1.010	MQS 12	46.2	1.286	0.486	0.5728	
1440 minute winter	MQS 12.1	4.000	MQS 12	-1.2	-0.258	-0.022	0.0652	
15 minute winter	MQS 12	1.011	MQS 13	1.5	0.422	0.020	0.1348	
15 minute winter	MQS 12	11.000	MQS 22	45.5	1.137	0.503	0.7211	
15 minute winter	MQS 13.2	5.000	MQS 13.1	7.5	0.522	0.195	0.1988	
15 minute winter	MQS 13.1	5.001	MQS 13	17.5	0.931	0.458	0.5533	
15 minute winter	MQS 13	1.012	MQS 14	19.1	0.701	0.218	0.1909	
15 minute winter	MQS 14.2	6.000	MQS 14.1	9.2	0.938	0.186	0.1725	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MQS 14.1	10	22.850	0.093	19.0	0.1327	0.0000	OK
15 minute winter	MQS 14	11	22.540	0.135	42.1	0.1522	0.0000	OK
15 minute winter	PS 1	11	23.664	0.128	24.1	0.1453	0.0000	OK
15 minute winter	PS 2	11	23.516	0.211	31.1	0.2383	0.0000	OK
360 minute winter	PS 3	240	23.195	0.054	7.9	37.1025	0.0000	OK
15 minute winter	PS 4	11	23.320	0.268	28.7	0.3836	0.0000	OK
1440 minute winter	PS 5.1	1110	23.125	0.148	3.3	83.8746	0.0000	OK
15 minute winter	PS 5.2	11	23.319	0.342	3.1	0.4897	0.0000	SURCHARGED
15 minute winter	PS 5	11	23.318	0.342	13.2	0.3871	0.0000	SURCHARGED
15 minute winter	MQS 15	10	23.846	0.040	3.4	0.0578	0.0000	OK
15 minute winter	MQS 16	10	22.955	0.055	9.2	0.0617	0.0000	OK
15 minute winter	MQS 17	11	22.591	0.084	13.4	0.0949	0.0000	OK
15 minute winter	MQS 18	11	22.399	0.091	16.2	0.1028	0.0000	OK
15 minute winter	MQS 19	11	22.362	0.203	60.7	0.2296	0.0000	OK
15 minute winter	MQS 20	12	22.175	0.162	63.3	0.2316	0.0000	OK
15 minute winter	MQS 21	13	22.088	0.388	63.2	0.4388	0.0000	SURCHARGED
15 minute winter	MQS 22	12	22.701	0.168	48.2	0.1900	0.0000	OK
15 minute winter	MQS 23	12	22.547	0.178	52.2	0.2011	0.0000	OK
15 minute winter	MQS 24	12	22.401	0.184	58.3	0.2083	0.0000	OK
15 minute winter	MQS 25.1	10	24.248	0.036	4.3	0.0409	0.0000	OK
15 minute winter	MQS 25	12	22.244	0.216	68.3	0.2443	0.0000	OK
15 minute winter	MQS 26.1	11	23.629	0.036	2.1	0.0412	0.0000	OK
15 minute winter	MQS 26	13	22.126	0.376	71.6	0.4257	0.0000	SURCHARGED
15 minute winter	SR 1	13	22.043	0.394	127.4	0.6966	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 winter	MQS 14.1	6.001	MQS 14	18.7	0.940	0.361	0.7047	
15 minute winter	MQS 14	1.013	MQS 19	42.6	1.043	0.409	1.1382	
15 minute winter	PS 1	7.000	PS 2	23.1	0.587	0.392	3.2967	
15 minute winter	PS 2	7.001	PS 3	33.9	1.507	0.575	1.5481	
360 minute winter	PS 3	7.002	PS 4	4.2	0.437	0.072	0.3267	
15 minute winter	PS 4	7.003	PS 5	13.2	0.549	0.214	1.6761	
1440 minute winter	PS 5.1	8.000	PS 5	-3.3	-0.342	-0.189	0.1289	
1440 minute winter	PS 5.1	Infiltration		0.0				
15 minute winter	PS 5.2	9.000	PS 5	-3.1	-0.335	-0.161	0.2227	
15 minute winter	PS 5	7.004	MQS 16	2.0	0.488	0.023	0.0769	
15 minute winter	MQS 15	10.000	MQS 16	3.3	0.704	0.067	0.0645	
15 minute winter	MQS 16	7.005	MQS 17	9.1	0.746	0.073	0.3914	
15 minute winter	MQS 17	7.006	MQS 18	13.3	0.779	0.169	0.6766	
15 minute winter	MQS 18	7.007	MQS 19	16.0	0.476	0.204	0.9703	
15 minute winter	MQS 19	1.014	MQS 20	59.6	1.338	0.764	1.3102	
15 minute winter	MQS 20	1.015	MQS 21	63.2	1.163	0.579	1.7707	
15 minute winter	MQS 21	1.016	SR 1	60.9	0.865	0.775	0.7130	
15 minute winter	MQS 22	11.001	MQS 23	48.7	1.159	0.538	1.0335	
15 minute winter	MQS 23	11.002	MQS 24	52.5	1.182	0.579	1.0111	
15 minute winter	MQS 24	11.003	MQS 25	58.4	1.170	0.616	1.2927	
15 minute winter	MQS 25.1	12.000	MQS 25	4.2	1.042	0.054	0.0933	
15 minute winter	MQS 25	11.004	MQS 26	67.7	1.295	0.781	1.7842	
15 minute winter	MQS 26.1	13.000	MQS 26	2.0	0.496	0.056	0.0767	
15 minute winter	MQS 26	11.005	SR 1	68.2	0.969	0.753	1.0666	
15 minute winter	SR 1	1.017	SR 2	125.5	0.869	0.550	3.3905	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	TS 1	10	25.915	0.065	9.9	0.0937	0.0000	OK
15 minute winter	TS 2	10	25.535	0.090	17.6	0.1290	0.0000	OK
15 minute winter	TS 3	11	25.324	0.126	24.8	0.1796	0.0000	OK
15 minute winter	TS 4	11	24.241	0.104	27.3	0.1483	0.0000	OK
15 minute summer	TS 5.1	1	24.086	0.000	0.0	0.0000	0.0000	OK
15 minute winter	TS 5	11	24.050	0.150	41.0	0.2149	0.0000	OK
15 minute winter	TS 28	10	25.780	0.051	6.3	0.0726	0.0000	OK
15 minute winter	TS 9	10	26.343	0.049	6.9	0.0556	0.0000	OK
15 minute winter	TS 10	11	25.206	0.113	22.9	0.1280	0.0000	OK
15 minute winter	TS 12	11	24.542	0.148	25.8	0.1677	0.0000	OK
15 minute winter	TS 13	13	23.855	0.285	66.1	0.3226	0.0000	OK
15 minute winter	TS 14	13	23.741	0.358	78.0	0.4044	0.0000	SURCHARGED
15 minute winter	TS 15	10	27.398	0.083	12.1	0.1186	0.0000	OK
15 minute winter	TS 16	10	27.352	0.104	18.8	0.1485	0.0000	OK
15 minute winter	TS 17	11	27.293	0.131	30.2	0.1880	0.0000	OK
15 minute winter	TS 18	11	27.030	0.123	30.1	0.1387	0.0000	OK
15 minute winter	TS 19	11	26.730	0.113	38.5	0.1611	0.0000	OK
15 minute summer	TS 20	1	27.796	0.000	0.0	0.0000	0.0000	OK
15 minute winter	TS 21	11	27.221	0.032	1.6	0.0464	0.0000	OK
180 minute winter	TS 22.1	148	26.492	0.073	5.7	14.1052	0.0000	OK
15 minute winter	TS 22	11	26.727	0.309	24.5	0.3499	0.0000	SURCHARGED
15 minute winter	TS 23.1	12	26.777	0.110	6.7	0.1243	0.0000	OK
15 minute winter	TS 23	11	26.763	0.532	20.6	0.6014	0.0000	SURCHARGED
15 minute winter	TS 24	11	26.781	0.690	9.7	0.7799	0.0000	SURCHARGED
15 minute winter	TS 25	11	25.818	0.301	44.2	0.3401	0.0000	SURCHARGED

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 winter	TS 1	14.000	TS 2	9.7	0.797	0.187	0.4957	
15 minute winter	TS 2	14.001	TS 3	17.3	0.932	0.333	0.4656	
15 minute winter	TS 3	14.002	TS 4	24.6	1.107	0.572	0.8990	
15 minute winter	TS 4	14.003	TS 5	27.2	0.962	0.245	0.6725	
15 minute summer	TS 5.1	15.000	TS 5	0.0	0.000	0.000	0.0000	
15 minute winter	TS 5	14.004	TS 13	40.1	0.899	0.513	3.3203	
15 minute winter	TS 28	16.000	TS 10	6.1	0.919	0.109	0.2337	
15 minute winter	TS 9	17.000	TS 10	6.8	1.076	0.101	0.1485	
15 minute winter	TS 10	16.001	TS 12	22.6	1.156	0.483	0.7058	
15 minute winter	TS 12	16.002	TS 13	26.0	0.989	0.710	0.4941	
15 minute winter	TS 13	14.005	TS 14	62.7	1.038	0.801	2.6154	
15 minute winter	TS 14	14.006	TS 32	67.3	1.061	0.857	2.4549	
15 minute winter	TS 15	18.000	TS 16	12.0	0.641	0.152	0.2495	
15 minute winter	TS 16	18.001	TS 17	18.4	0.722	0.235	0.4404	
15 minute winter	TS 17	18.002	TS 18	30.1	1.064	0.384	1.4478	
15 minute winter	TS 18	18.003	TS 19	29.7	1.166	0.332	1.1439	
15 minute winter	TS 19	18.004	TS 25	38.0	1.698	0.245	0.2226	
15 minute summer	TS 20	19.000	TS 21	0.0	0.000	0.000	0.0000	
15 minute winter	TS 21	19.001	TS 22	1.6	0.460	0.044	0.0622	
180 minute winter	TS 22.1	20.000	TS 22	-5.7	-0.806	-0.241	0.0277	
15 minute winter	TS 22	19.002	TS 23	-14.9	0.678	-0.414	1.5402	
15 minute winter	TS 23.1	21.000	TS 23	8.5	0.376	0.142	0.9829	
15 minute winter	TS 23	19.003	TS 24	8.7	0.446	0.206	0.8460	
15 minute winter	TS 24	19.004	TS 25	1.5	0.521	0.033	0.0229	
15 minute winter	TS 25	18.005	TS 26	54.3	1.204	0.607	2.3526	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	TS 26.1	675	25.277	0.179	3.2	62.0606	0.0000	OK
15 minute winter	TS 26	11	25.742	0.644	56.1	0.9215	0.0000	SURCHARGED
30 minute summer	TS 31	18	25.072	0.054	6.6	0.0609	0.0000	OK
15 minute winter	TS 32	12	23.597	0.389	76.2	0.4401	0.0000	SURCHARGED
15 minute winter	AS 13.1	11	25.093	0.043	4.5	0.0489	0.0000	OK
15 minute winter	AS 13	12	23.472	0.373	95.8	0.4216	0.0000	SURCHARGED
15 minute winter	SR 2	13	22.004	0.466	221.3	0.8227	0.0000	SURCHARGED
15 minute winter	SR 3	13	19.766	0.333	220.6	0.5880	0.0000	OK
15 minute winter	KS1	12	20.156	0.060	8.4	1.4057	0.0000	OK
15 minute winter	KS2	11	20.141	0.124	28.3	0.1398	0.0000	OK
15 minute winter	KS3	12	19.960	0.162	33.6	0.1833	0.0000	OK
15 minute winter	KS4	10	23.278	0.069	7.8	0.0988	0.0000	OK
15 minute winter	KS5	11	23.096	0.083	10.2	0.0938	0.0000	OK
15 minute winter	KS6	11	22.958	0.074	20.6	0.1055	0.0000	OK
15 minute winter	KS7	11	19.941	0.206	63.3	0.2327	0.0000	OK
15 minute winter	KS8	12	19.831	0.232	68.8	0.2621	0.0000	OK
15 minute winter	KS9	12	19.758	0.229	72.9	0.2591	0.0000	OK
15 minute winter	KS10	11	21.691	0.067	7.1	0.0957	0.0000	OK
15 minute winter	KS11	13	19.700	0.254	85.0	0.3637	0.0000	OK
120 minute winter	KS12	96	19.462	0.102	21.2	37.8259	0.0000	OK
60 minute winter	KS13	57	19.473	0.113	29.7	34.9248	0.0000	OK
15 minute winter	KS14	12	19.648	0.287	86.2	0.5078	0.0000	OK
15 minute winter	KS15	12	19.675	0.250	29.8	0.3578	0.0000	OK
15 minute winter	KS16	11	21.720	0.083	17.2	0.0937	0.0000	OK
15 minute winter	KS17	13	19.672	0.442	127.0	0.7810	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)
960 minute winter	TS 26.1	22.000	TS 26	-3.2	-0.308	-0.061	0.2094	
15 minute winter	TS 26	18.006	TS 31	3.5	0.639	0.079	0.0673	
30 minute summer	TS 31	18.007	TS 32	6.6	0.917	0.122	0.2193	
15 minute winter	TS 32	14.007	AS 13	75.3	1.070	0.961	1.5365	
15 minute winter	AS 13.1	23.000	AS 13	4.3	0.804	0.080	0.2928	
15 minute winter	AS 13	14.008	SR 2	92.9	1.348	1.187	3.6330	
15 minute winter	SR 2	1.018	SR 3	220.6	1.486	1.201	6.6596	
15 minute winter	SR 3	1.019	SR 4	222.5	1.509	0.688	4.5817	
15 minute winter	KS1	24.000	KS2	6.6	0.334	0.058	0.5085	
15 minute winter	KS2	24.001	KS3	27.8	0.757	0.242	2.5163	
15 minute winter	KS3	24.002	KS7	32.7	0.629	0.284	1.0119	
15 minute winter	KS4	25.000	KS5	7.6	0.655	0.208	0.4603	
15 minute winter	KS5	25.001	KS6	10.1	0.825	0.276	0.3156	
15 minute winter	KS6	25.002	KS7	20.6	1.891	0.217	0.3564	
15 minute winter	KS7	24.003	KS8	62.7	0.943	0.544	2.7056	
15 minute winter	KS8	24.004	KS9	68.8	0.970	0.599	1.4895	
15 minute winter	KS9	24.005	KS11	72.9	0.996	0.556	1.4270	
15 minute winter	KS10	26.000	KS11	6.9	0.707	0.188	0.2984	
15 minute winter	KS11	24.006	KS14	83.2	1.163	0.447	2.9269	
120 minute winter	KS12	27.000	KS14	-21.2	-0.960	-0.178	0.2492	
60 minute winter	KS13	28.000	KS14	-29.7	-1.291	-0.249	0.2021	
15 minute winter	KS14	24.007	KS17	66.7	0.793	0.359	5.1503	
15 minute winter	KS15	29.000	KS17	22.9	0.485	0.113	5.5475	
15 minute winter	KS16	30.000	KS17	16.7	0.847	0.073	0.8359	
15 minute winter	KS17	24.008	KS18	83.0	0.816	0.445	3.9037	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SR 4	13	19.637	0.527	300.8	0.9317	0.0000	SURCHARGED
60 minute winter	SR 5.1	47	19.508	0.628	130.0	113.1049	0.0000	SURCHARGED
60 minute winter	SR 5	47	19.508	0.628	201.2	1.1092	0.0000	SURCHARGED
60 minute winter	SR 6	47	19.491	0.794	66.3	2.0199	0.0000	SURCHARGED
60 minute winter	SR 7	47	19.484	0.832	66.4	2.1165	0.0000	SURCHARGED
15 minute winter	Ex.S 6	10	17.890	0.160	65.0	0.2292	0.0000	OK
15 minute winter	Ex.S 7	10	17.753	0.145	66.2	0.0000	0.0000	OK
15 minute winter	KS18	13	19.645	0.498	83.0	0.7121	0.0000	SURCHARGED

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 winter	SR 4	1.020	SR 5	303.2	1.925	1.094	4.9472	
60 minute winter	SR 5.1	31.000	SR 5	-130.0	-1.461	-1.090	0.4658	
60 minute winter	SR 5	1.021	SR 6	66.3	0.725	0.290	5.7827	
60 minute winter	SR 6	1.022	SR 7	64.7	0.408	0.284	1.4271	
60 minute winter	SR 7	1.023	Ex.S 6	64.9	1.182	0.285	0.6151	
15 minute winter	Ex.S 6	1.024	Ex.S 7	66.2	1.398	0.232	0.7441	178.2
15 minute winter	KS18	24.009	SR 4	80.9	0.535	0.435	1.7600	

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Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MQS 1	11	30.966	0.350	44.9	0.5007	0.0000	SURCHARGED
15 minute winter	MQS 2	11	30.690	0.255	46.8	0.3648	0.0000	SURCHARGED
60 minute winter	MQS 3	45	30.036	0.469	31.7	31.9285	0.0000	SURCHARGED
120 minute winter	MQS 4	90	28.989	0.479	16.4	10.7539	0.0000	SURCHARGED
15 minute winter	MQS 5.1	10	28.145	0.075	12.7	0.1066	0.0000	OK
180 minute winter	MQS 5	136	27.816	0.486	15.0	10.9469	0.0000	SURCHARGED
15 minute winter	MQS 6	11	26.729	0.094	17.2	0.1066	0.0000	OK
15 minute winter	MQS 7	11	26.116	0.150	38.5	0.1700	0.0000	OK
15 minute winter	MQS 8	12	24.644	0.654	52.2	0.7395	0.0000	SURCHARGED
15 minute winter	MQS 9.3	10	27.654	0.074	16.0	0.0838	0.0000	OK
15 minute winter	MQS 9.2	10	26.472	0.093	31.8	0.1049	0.0000	OK
15 minute winter	MQS 9.1	11	25.149	0.105	34.9	0.1503	0.0000	OK
15 minute winter	MQS 9	12	24.575	0.830	83.2	0.9384	0.0000	SURCHARGED
15 minute winter	MQS 10	12	24.458	0.790	91.9	0.8932	0.0000	SURCHARGED
15 minute winter	MQS 11	12	24.166	0.649	104.0	0.7343	0.0000	SURCHARGED
360 minute winter	MQS 12.1	256	22.743	0.090	8.0	45.1228	0.0000	OK
15 minute winter	MQS 12	12	23.961	1.307	114.4	1.4788	0.0000	SURCHARGED
15 minute winter	MQS 13.2	11	23.829	0.163	18.6	0.2338	0.0000	OK
15 minute winter	MQS 13.1	11	23.815	0.225	42.8	0.3225	0.0000	SURCHARGED
15 minute winter	MQS 13	13	23.436	0.988	41.2	1.1178	0.0000	SURCHARGED
15 minute winter	MQS 14.2	10	23.673	0.113	23.0	0.1623	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 winter	MQS 1	1.000	MQS 2	43.2	1.086	1.149	1.3673	
15 minute winter	MQS 2	1.001	MQS 3	47.1	1.206	1.250	0.3634	
60 minute winter	MQS 3	1.002	MQS 4	12.9	0.925	0.304	0.3489	
60 minute winter	MQS 3	Infiltration		0.0				
120 minute winter	MQS 4	1.003	MQS 5	12.9	0.830	0.353	0.3557	
120 minute winter	MQS 4	Infiltration		0.0				
15 minute winter	MQS 5.1	2.000	MQS 5	12.3	1.101	0.227	0.3796	
180 minute winter	MQS 5	1.004	MQS 6	13.2	1.008	0.271	0.1487	
180 minute winter	MQS 5	Infiltration		0.0				
15 minute winter	MQS 6	1.005	MQS 7	17.1	1.132	0.333	0.2555	
15 minute winter	MQS 7	1.006	MQS 8	38.4	1.405	0.740	0.9506	
15 minute winter	MQS 8	1.007	MQS 9	47.9	0.847	0.484	2.1656	
15 minute winter	MQS 9.3	3.000	MQS 9.2	15.6	1.400	0.224	0.3938	
15 minute winter	MQS 9.2	3.001	MQS 9.1	31.5	1.883	0.357	0.7817	
15 minute winter	MQS 9.1	3.002	MQS 9	34.6	2.001	0.393	0.2691	
15 minute winter	MQS 9	1.008	MQS 10	80.3	1.141	1.023	1.0800	
15 minute winter	MQS 10	1.009	MQS 11	93.8	1.332	1.278	2.4190	
15 minute winter	MQS 11	1.010	MQS 12	108.9	1.546	1.145	1.1226	
360 minute winter	MQS 12.1	4.000	MQS 12	-8.0	-0.662	-0.151	0.2001	
15 minute winter	MQS 12	1.011	MQS 13	-17.8	0.436	-0.244	2.1029	
15 minute winter	MQS 12	11.000	MQS 22	78.6	1.227	0.868	1.2683	
15 minute winter	MQS 13.2	5.000	MQS 13.1	17.4	0.584	0.452	0.4840	
15 minute winter	MQS 13.1	5.001	MQS 13	41.2	1.131	1.078	1.0589	
15 minute winter	MQS 13	1.012	MQS 14	41.5	0.654	0.474	0.4857	
15 minute winter	MQS 14.2	6.000	MQS 14.1	22.7	1.181	0.456	0.3964	

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Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MQS 14.1	12	23.552	0.795	46.5	1.1382	0.0000	SURCHARGED
15 minute winter	MQS 14	13	23.429	1.024	86.0	1.1580	0.0000	SURCHARGED
15 minute winter	PS 1	10	24.030	0.494	58.8	0.5583	0.0000	SURCHARGED
15 minute winter	PS 2	11	23.791	0.486	78.9	0.5502	0.0000	SURCHARGED
2160 minute winter	PS 3	1680	23.269	0.128	4.8	88.1358	0.0000	OK
15 minute winter	PS 4	9	23.608	0.556	70.0	0.7956	0.0000	SURCHARGED
2160 minute winter	PS 5.1	1680	23.269	0.292	5.3	165.3873	0.0000	OK
15 minute summer	PS 5.2	10	23.600	0.623	6.4	0.8912	0.0000	SURCHARGED
15 minute summer	PS 5	10	23.599	0.623	23.5	0.7048	0.0000	SURCHARGED
15 minute winter	MQS 15	10	23.870	0.064	8.3	0.0919	0.0000	OK
15 minute winter	MQS 16	13	23.363	0.463	30.7	0.5241	0.0000	SURCHARGED
15 minute winter	MQS 17	13	23.374	0.867	36.8	0.9810	0.0000	SURCHARGED
15 minute winter	MQS 18	13	23.354	1.046	41.1	1.1836	0.0000	SURCHARGED
15 minute winter	MQS 19	13	23.324	1.165	94.2	1.3172	0.0000	SURCHARGED
15 minute winter	MQS 20	13	23.062	1.049	96.8	1.5009	0.0000	SURCHARGED
15 minute winter	MQS 21	12	22.787	1.087	99.2	1.2292	0.0000	SURCHARGED
15 minute winter	MQS 22	12	23.886	1.353	86.5	1.5298	0.0000	SURCHARGED
15 minute winter	MQS 23	12	23.764	1.395	91.3	1.5780	0.0000	SURCHARGED
15 minute winter	MQS 24	12	23.617	1.400	93.8	1.5833	0.0000	SURCHARGED
15 minute winter	MQS 25.1	10	24.269	0.057	10.5	0.0643	0.0000	OK
15 minute winter	MQS 25	12	23.386	1.358	118.7	1.5362	0.0000	SURCHARGED
15 minute winter	MQS 26.1	10	23.651	0.058	5.2	0.0655	0.0000	OK
15 minute winter	MQS 26	12	22.978	1.228	126.2	1.3893	0.0000	SURCHARGED
15 minute winter	SR 1	12	22.693	1.044	215.4	1.8456	0.0000	SURCHARGED

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 winter	MQS 14.1	6.001	MQS 14	41.8	1.183	0.804	1.4006	
15 minute winter	MQS 14	1.013	MQS 19	84.7	1.204	0.814	1.9708	
15 minute winter	PS 1	7.000	PS 2	58.3	0.828	0.988	5.6854	
15 minute winter	PS 2	7.001	PS 3	76.1	1.650	1.290	2.3653	
2160 minute winter	PS 3	7.002	PS 4	4.3	0.369	0.073	1.3004	
15 minute winter	PS 4	7.003	PS 5	23.6	0.633	0.384	1.7249	
2160 minute winter	PS 5.1	8.000	PS 5	-5.3	-0.290	-0.301	0.2591	
2160 minute winter	PS 5.1	Infiltration		0.0				
15 minute summer	PS 5.2	9.000	PS 5	-6.4	-0.372	-0.337	0.2227	
15 minute summer	PS 5	7.004	MQS 16	-8.4	0.484	-0.096	0.7162	
15 minute winter	MQS 15	10.000	MQS 16	8.2	0.905	0.164	0.1233	
15 minute winter	MQS 16	7.005	MQS 17	29.5	0.889	0.238	2.2233	
15 minute winter	MQS 17	7.006	MQS 18	39.8	0.865	0.508	2.7963	
15 minute winter	MQS 18	7.007	MQS 19	44.4	0.630	0.567	2.0301	
15 minute winter	MQS 19	1.014	MQS 20	91.7	1.319	1.175	2.0674	
15 minute winter	MQS 20	1.015	MQS 21	99.2	1.408	0.909	2.2843	
15 minute winter	MQS 21	1.016	SR 1	101.8	1.446	1.295	0.7130	
15 minute winter	MQS 22	11.001	MQS 23	81.1	1.171	0.896	1.7315	
15 minute winter	MQS 23	11.002	MQS 24	77.8	1.157	0.859	1.6033	
15 minute winter	MQS 24	11.003	MQS 25	92.0	1.307	0.972	1.8272	
15 minute winter	MQS 25.1	12.000	MQS 25	10.3	1.344	0.133	0.1771	
15 minute winter	MQS 25	11.004	MQS 26	116.2	1.650	1.339	2.0799	
15 minute winter	MQS 26.1	13.000	MQS 26	5.0	0.642	0.138	0.1471	
15 minute winter	MQS 26	11.005	SR 1	125.7	1.785	1.388	1.0666	
15 minute winter	SR 1	1.017	SR 2	216.8	1.368	0.950	3.5149	

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Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	TS 1	10	25.956	0.106	24.1	0.1516	0.0000	OK
15 minute winter	TS 2	11	25.792	0.347	42.9	0.4972	0.0000	SURCHARGED
15 minute winter	TS 3	11	25.625	0.427	55.8	0.6110	0.0000	SURCHARGED
15 minute winter	TS 4	10	25.205	1.068	62.7	1.5282	0.0000	SURCHARGED
30 minute winter	TS 5.1	24	24.308	0.222	119.3	30.3325	0.0000	OK
15 minute winter	TS 5	10	25.168	1.268	144.3	1.8142	0.0000	SURCHARGED
15 minute winter	TS 28	10	25.810	0.081	15.4	0.1165	0.0000	OK
15 minute winter	TS 9	10	26.373	0.079	16.8	0.0890	0.0000	OK
15 minute winter	TS 10	11	25.738	0.645	56.9	0.7300	0.0000	SURCHARGED
15 minute winter	TS 12	11	25.371	0.977	64.9	1.1050	0.0000	SURCHARGED
15 minute summer	TS 13	11	25.154	1.584	89.6	1.7916	0.0000	SURCHARGED
15 minute summer	TS 14	11	25.059	1.676	92.6	1.8952	0.0000	SURCHARGED
15 minute winter	TS 15	10	27.465	0.150	29.6	0.2145	0.0000	OK
15 minute winter	TS 16	11	27.442	0.193	45.8	0.2769	0.0000	OK
15 minute winter	TS 17	11	27.401	0.239	73.3	0.3423	0.0000	OK
15 minute winter	TS 18	11	27.121	0.214	72.7	0.2424	0.0000	OK
15 minute winter	TS 19	11	26.815	0.198	93.6	0.2840	0.0000	OK
15 minute summer	TS 20	1	27.796	0.000	0.0	0.0000	0.0000	OK
15 minute winter	TS 21	10	27.240	0.051	4.0	0.0725	0.0000	OK
360 minute winter	TS 22.1	344	26.701	0.282	8.5	54.3069	0.0000	OK
15 minute summer	TS 22	10	27.118	0.700	73.1	0.7916	0.0000	SURCHARGED
15 minute summer	TS 23.1	10	27.278	0.611	24.7	0.6913	0.0000	SURCHARGED
15 minute summer	TS 23	10	27.204	0.973	31.6	1.1003	0.0000	SURCHARGED
15 minute winter	TS 24	10	27.212	1.121	14.9	1.2679	0.0000	SURCHARGED
15 minute winter	TS 25	10	26.603	1.086	112.4	1.2279	0.0000	SURCHARGED

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 winter	TS 1	14.000	TS 2	23.7	0.973	0.457	1.1715	
15 minute winter	TS 2	14.001	TS 3	39.1	1.087	0.753	0.9858	
15 minute winter	TS 3	14.002	TS 4	56.3	1.421	1.309	1.6092	
15 minute winter	TS 4	14.003	TS 5	70.9	1.024	0.638	1.6667	
30 minute winter	TS 5.1	15.000	TS 5	-119.3	-2.395	-5.356	0.1315	
15 minute winter	TS 5	14.004	TS 13	63.0	0.982	0.805	4.6470	
15 minute winter	TS 28	16.000	TS 10	15.7	1.132	0.282	0.9211	
15 minute winter	TS 9	17.000	TS 10	16.5	1.375	0.246	0.2842	
15 minute winter	TS 10	16.001	TS 12	58.5	1.472	1.251	1.4355	
15 minute winter	TS 12	16.002	TS 13	71.6	1.799	1.956	0.7489	
15 minute summer	TS 13	14.005	TS 14	69.6	1.001	0.889	2.6390	
15 minute summer	TS 14	14.006	TS 32	93.7	1.330	1.194	2.4549	
15 minute winter	TS 15	18.000	TS 16	29.1	0.716	0.370	0.5525	
15 minute winter	TS 16	18.001	TS 17	44.5	0.832	0.569	0.9327	
15 minute winter	TS 17	18.002	TS 18	72.7	1.276	0.928	2.9113	
15 minute winter	TS 18	18.003	TS 19	72.1	1.411	0.807	2.3077	
15 minute winter	TS 19	18.004	TS 25	93.0	2.078	0.601	0.4521	
15 minute summer	TS 20	19.000	TS 21	0.0	0.000	0.000	0.0000	
15 minute winter	TS 21	19.001	TS 22	3.9	0.595	0.107	0.1176	
360 minute winter	TS 22.1	20.000	TS 22	-8.5	-0.698	-0.355	0.1422	
15 minute summer	TS 22	19.002	TS 23	-36.9	-0.929	-1.027	1.5402	
15 minute summer	TS 23.1	21.000	TS 23	16.5	0.429	0.276	1.3246	
15 minute summer	TS 23	19.003	TS 24	-7.7	0.480	-0.184	0.8460	
15 minute winter	TS 24	19.004	TS 25	7.4	0.706	0.164	0.3160	
15 minute winter	TS 25	18.005	TS 26	118.7	1.685	1.328	2.3533	

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Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	TS 26.1	735	25.508	0.410	7.2	142.0814	0.0000	SURCHARGED
15 minute winter	TS 26	9	26.320	1.222	124.1	1.7490	0.0000	SURCHARGED
15 minute winter	TS 31	10	25.093	0.075	12.7	0.0853	0.0000	OK
15 minute winter	TS 32	11	24.802	1.594	119.9	1.8031	0.0000	SURCHARGED
15 minute winter	AS 13.1	11	25.119	0.069	11.0	0.0776	0.0000	OK
15 minute winter	AS 13	11	24.500	1.401	166.6	1.5843	0.0000	SURCHARGED
15 minute winter	SR 2	12	22.552	1.014	373.6	1.7914	0.0000	SURCHARGED
15 minute summer	SR 3	11	20.709	1.276	364.3	2.2540	0.0000	SURCHARGED
15 minute winter	KS1	12	20.472	0.376	83.5	8.7506	0.0000	SURCHARGED
15 minute summer	KS2	11	20.490	0.473	75.0	0.5351	0.0000	SURCHARGED
15 minute winter	KS3	10	20.492	0.694	81.8	0.7847	0.0000	SURCHARGED
15 minute winter	KS4	10	23.323	0.114	19.2	0.1627	0.0000	OK
15 minute winter	KS5	11	23.153	0.140	25.3	0.1588	0.0000	OK
15 minute winter	KS6	11	23.007	0.123	50.9	0.1758	0.0000	OK
15 minute winter	KS7	10	20.473	0.738	126.3	0.8351	0.0000	SURCHARGED
15 minute winter	KS8	10	20.408	0.809	141.8	0.9155	0.0000	SURCHARGED
15 minute winter	KS9	10	20.301	0.772	148.9	0.8734	0.0000	SURCHARGED
15 minute winter	KS10	10	21.734	0.110	17.3	0.1577	0.0000	OK
15 minute winter	KS11	10	20.243	0.797	176.7	1.1399	0.0000	SURCHARGED
120 minute winter	KS12	116	19.991	0.631	124.7	233.9369	0.0000	SURCHARGED
120 minute winter	KS13	116	19.991	0.631	102.9	196.3935	0.0000	SURCHARGED
15 minute winter	KS14	10	20.177	0.816	339.6	1.4416	0.0000	SURCHARGED
15 minute winter	KS15	10	20.330	0.905	127.3	1.2948	0.0000	SURCHARGED
15 minute winter	KS16	10	21.769	0.132	42.0	0.1495	0.0000	OK
15 minute winter	KS17	10	20.245	1.015	154.5	1.7926	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	TS 26.1	22.000	TS 26	-7.2	-0.477	-0.135	0.3365	
15 minute winter	TS 26	18.006	TS 31	4.1	0.664	0.093	0.0959	
15 minute winter	TS 31	18.007	TS 32	12.5	1.092	0.231	0.4687	
15 minute winter	TS 32	14.007	AS 13	113.6	1.614	1.451	1.5365	
15 minute winter	AS 13.1	23.000	AS 13	10.6	1.043	0.199	0.5604	
15 minute winter	AS 13	14.008	SR 2	167.3	2.377	2.137	3.8904	
15 minute winter	SR 2	1.018	SR 3	375.1	2.368	2.042	7.2952	
15 minute summer	SR 3	1.019	SR 4	368.0	2.323	1.137	5.1101	
15 minute winter	KS1	24.000	KS2	-64.2	0.658	-0.561	2.6320	
15 minute summer	KS2	24.001	KS3	76.2	0.820	0.663	7.2486	
15 minute winter	KS3	24.002	KS7	88.1	0.810	0.766	2.0792	
15 minute winter	KS4	25.000	KS5	18.9	0.821	0.515	0.8999	
15 minute winter	KS5	25.001	KS6	25.0	1.036	0.681	0.6197	
15 minute winter	KS6	25.002	KS7	50.7	2.379	0.533	0.6978	
15 minute winter	KS7	24.003	KS8	128.4	1.164	1.114	4.4783	
15 minute winter	KS8	24.004	KS9	140.1	1.270	1.218	2.3138	
15 minute winter	KS9	24.005	KS11	147.9	1.341	1.128	2.1174	
15 minute winter	KS10	26.000	KS11	16.8	0.896	0.458	0.5767	
15 minute winter	KS11	24.006	KS14	177.4	1.389	0.952	4.9675	
120 minute winter	KS12	27.000	KS14	-124.7	-1.724	-1.046	1.4475	
120 minute winter	KS13	28.000	KS14	-102.9	-1.608	-0.863	1.0454	
15 minute winter	KS14	24.007	KS17	-154.8	-1.009	-0.835	6.2495	
15 minute winter	KS15	29.000	KS17	-84.3	-0.587	-0.415	7.7541	
15 minute winter	KS16	30.000	KS17	40.8	1.091	0.179	1.5972	
15 minute winter	KS17	24.008	KS18	-93.7	0.864	-0.502	3.9117	

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Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SR 4	10	20.207	1.097	414.7	1.9379	0.0000	SURCHARGED
60 minute winter	SR 5.1	47	20.001	1.121	180.9	202.1412	0.0000	SURCHARGED
60 minute winter	SR 5	47	20.000	1.120	247.4	1.9795	0.0000	SURCHARGED
60 minute winter	SR 6	47	19.975	1.278	75.2	3.2517	0.0000	SURCHARGED
60 minute winter	SR 7	47	19.964	1.312	76.5	3.3392	0.0000	SURCHARGED
60 minute winter	Ex.S 6	47	17.903	0.173	76.3	0.2482	0.0000	OK
60 minute winter	Ex.S 7	47	17.764	0.156	76.3	0.0000	0.0000	OK
15 minute winter	KS18	10	20.231	1.084	93.4	1.5507	0.0000	SURCHARGED

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 winter	SR 4	1.020	SR 5	413.1	2.608	1.490	4.9472	
60 minute winter	SR 5.1	31.000	SR 5	-180.9	-1.630	-1.516	0.4658	
60 minute winter	SR 5	1.021	SR 6	75.2	0.830	0.329	5.7827	
60 minute winter	SR 6	1.022	SR 7	75.1	0.474	0.329	1.4271	
60 minute winter	SR 7	1.023	Ex.S 6	76.3	1.233	0.335	0.6937	
60 minute winter	Ex.S 6	1.024	Ex.S 7	76.3	1.452	0.268	0.8267	450.0
15 minute winter	KS18	24.009	SR 4	-93.4	-0.590	-0.503	1.7600	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MQS 1	11	31.383	0.767	63.5	1.0971	0.0000	SURCHARGED
15 minute winter	MQS 2	11	30.828	0.393	66.2	0.5618	0.0000	SURCHARGED
60 minute winter	MQS 3	44	30.563	0.996	44.9	41.7776	0.0000	SURCHARGED
120 minute winter	MQS 4	92	29.340	0.830	23.4	18.6729	0.0000	SURCHARGED
15 minute winter	MQS 5.1	10	28.160	0.090	18.0	0.1292	0.0000	OK
180 minute winter	MQS 5	140	28.132	0.802	20.4	18.0856	0.0000	SURCHARGED
15 minute winter	MQS 6	11	26.748	0.113	23.4	0.1280	0.0000	OK
15 minute winter	MQS 7	11	26.176	0.210	54.0	0.2377	0.0000	OK
15 minute winter	MQS 8	12	25.744	1.754	72.6	1.9835	0.0000	SURCHARGED
15 minute winter	MQS 9.3	10	27.670	0.090	22.6	0.1014	0.0000	OK
15 minute winter	MQS 9.2	10	26.493	0.114	45.0	0.1284	0.0000	OK
15 minute winter	MQS 9.1	12	25.714	0.670	49.5	0.9587	0.0000	SURCHARGED
15 minute winter	MQS 9	12	25.609	1.864	108.7	2.1080	0.0000	SURCHARGED
15 minute winter	MQS 10	12	25.406	1.738	126.3	1.9660	0.0000	SURCHARGED
15 minute winter	MQS 11	12	24.892	1.375	145.0	1.5554	0.0000	SURCHARGED
60 minute winter	MQS 12.1	60	22.778	0.125	77.4	62.4847	0.0000	OK
15 minute winter	MQS 12	11	24.594	1.941	161.3	2.1949	0.0000	SURCHARGED
15 minute winter	MQS 13.2	13	24.554	0.888	26.3	1.2708	0.0000	SURCHARGED
15 minute winter	MQS 13.1	13	24.537	0.947	59.8	1.3550	0.0000	SURCHARGED
15 minute winter	MQS 13	13	24.362	1.914	56.6	2.1643	0.0000	SURCHARGED
15 minute winter	MQS 14.2	13	24.623	1.063	32.6	1.5217	0.0000	SURCHARGED

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 winter	MQS 1	1.000	MQS 2	61.1	1.537	1.626	1.3673	
15 minute winter	MQS 2	1.001	MQS 3	66.6	1.674	1.766	0.3827	
60 minute winter	MQS 3	1.002	MQS 4	19.7	1.029	0.464	0.4781	
60 minute winter	MQS 3	Infiltration		0.0				
120 minute winter	MQS 4	1.003	MQS 5	17.7	0.897	0.483	0.4499	
120 minute winter	MQS 4	Infiltration		0.0				
15 minute winter	MQS 5.1	2.000	MQS 5	17.5	1.208	0.322	0.4909	
180 minute winter	MQS 5	1.004	MQS 6	17.5	1.081	0.359	0.1834	
180 minute winter	MQS 5	Infiltration		0.0				
15 minute winter	MQS 6	1.005	MQS 7	23.4	1.222	0.455	0.3228	
15 minute winter	MQS 7	1.006	MQS 8	53.1	1.464	1.023	1.2956	
15 minute winter	MQS 8	1.007	MQS 9	66.4	0.943	0.670	2.1656	
15 minute winter	MQS 9.3	3.000	MQS 9.2	22.1	1.536	0.318	0.5082	
15 minute winter	MQS 9.2	3.001	MQS 9.1	44.7	2.014	0.507	1.3843	
15 minute winter	MQS 9.1	3.002	MQS 9	53.2	2.081	0.604	0.6184	
15 minute winter	MQS 9	1.008	MQS 10	116.7	1.658	1.487	1.0800	
15 minute winter	MQS 10	1.009	MQS 11	135.1	1.919	1.842	2.4190	
15 minute winter	MQS 11	1.010	MQS 12	154.2	2.189	1.622	1.1226	
60 minute winter	MQS 12.1	4.000	MQS 12	-77.4	-1.634	-1.461	0.4680	
15 minute winter	MQS 12	1.011	MQS 13	-40.3	-0.658	-0.552	2.1029	
15 minute winter	MQS 12	11.000	MQS 22	81.6	1.229	0.901	1.2683	
15 minute winter	MQS 13.2	5.000	MQS 13.1	23.9	0.602	0.621	0.5451	
15 minute winter	MQS 13.1	5.001	MQS 13	56.6	1.429	1.483	1.1707	
15 minute winter	MQS 13	1.012	MQS 14	43.3	0.645	0.495	0.4857	
15 minute winter	MQS 14.2	6.000	MQS 14.1	29.2	1.246	0.589	0.6973	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MQS 14.1	13	24.591	1.834	60.9	2.6245	0.0000	SURCHARGED
15 minute winter	MQS 14	13	24.348	1.943	96.1	2.1978	0.0000	SURCHARGED
15 minute winter	PS 1	11	24.665	1.129	83.1	1.2773	0.0000	SURCHARGED
15 minute winter	PS 2	11	24.212	0.907	108.5	1.0261	0.0000	SURCHARGED
1440 minute winter	PS 3	1350	23.364	0.223	8.9	153.2578	0.0000	OK
15 minute winter	PS 4	9	23.770	0.718	99.0	1.0280	0.0000	SURCHARGED
1440 minute winter	PS 5.1	1380	23.364	0.387	9.8	218.9492	0.0000	SURCHARGED
15 minute winter	PS 5.2	9	23.750	0.773	7.6	1.1056	0.0000	SURCHARGED
15 minute winter	PS 5	9	23.750	0.774	35.9	0.8755	0.0000	SURCHARGED
15 minute winter	MQS 15	13	24.199	0.393	11.7	0.5626	0.0000	SURCHARGED
15 minute winter	MQS 16	13	24.198	1.298	57.9	1.4680	0.0000	SURCHARGED
15 minute winter	MQS 17	13	24.189	1.682	54.9	1.9022	0.0000	FLOOD RISK
15 minute winter	MQS 18	13	24.166	1.858	43.0	2.1010	0.0000	SURCHARGED
15 minute winter	MQS 19	13	24.142	1.983	116.2	2.2426	0.0000	SURCHARGED
15 minute winter	MQS 20	13	23.752	1.739	124.3	2.4887	0.0000	SURCHARGED
15 minute winter	MQS 21	12	23.300	1.600	128.4	1.8101	0.0000	SURCHARGED
15 minute winter	MQS 22	11	24.525	1.992	90.8	2.2525	0.0000	SURCHARGED
15 minute winter	MQS 23	11	24.402	2.033	91.6	2.2997	0.0000	SURCHARGED
15 minute winter	MQS 24	12	24.268	2.051	106.8	2.3198	0.0000	SURCHARGED
15 minute winter	MQS 25.1	10	24.280	0.068	14.9	0.0773	0.0000	OK
15 minute winter	MQS 25	12	24.025	1.997	143.5	2.2588	0.0000	SURCHARGED
15 minute winter	MQS 26.1	10	23.662	0.069	7.3	0.0785	0.0000	OK
15 minute winter	MQS 26	12	23.504	1.754	150.0	1.9842	0.0000	SURCHARGED
15 minute winter	SR 1	12	23.127	1.478	261.6	2.6117	0.0000	SURCHARGED

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 winter	MQS 14.1	6.001	MQS 14	47.6	1.225	0.917	1.4006	
15 minute winter	MQS 14	1.013	MQS 19	85.7	1.217	0.823	1.9708	
15 minute winter	PS 1	7.000	PS 2	79.4	1.127	1.345	5.6854	
15 minute winter	PS 2	7.001	PS 3	107.2	2.163	1.817	2.7055	
1440 minute winter	PS 3	7.002	PS 4	6.6	0.416	0.113	1.9752	
15 minute winter	PS 4	7.003	PS 5	33.4	0.733	0.544	1.7249	
1440 minute winter	PS 5.1	8.000	PS 5	-9.8	-0.381	-0.558	0.2608	
1440 minute winter	PS 5.1	Infiltration		0.0				
15 minute winter	PS 5.2	9.000	PS 5	-7.6	-0.453	-0.395	0.2227	
15 minute winter	PS 5	7.004	MQS 16	-16.7	0.536	-0.191	0.8622	
15 minute winter	MQS 15	10.000	MQS 16	11.5	0.991	0.231	0.5442	
15 minute winter	MQS 16	7.005	MQS 17	-32.9	0.921	-0.265	2.2233	
15 minute winter	MQS 17	7.006	MQS 18	42.7	0.866	0.545	2.7963	
15 minute winter	MQS 18	7.007	MQS 19	47.4	0.674	0.606	2.0301	
15 minute winter	MQS 19	1.014	MQS 20	119.7	1.700	1.532	2.0674	
15 minute winter	MQS 20	1.015	MQS 21	128.4	1.824	1.177	2.2843	
15 minute winter	MQS 21	1.016	SR 1	132.2	1.878	1.682	0.7130	
15 minute winter	MQS 22	11.001	MQS 23	79.7	1.162	0.880	1.7315	
15 minute winter	MQS 23	11.002	MQS 24	82.6	1.174	0.912	1.6033	
15 minute winter	MQS 24	11.003	MQS 25	103.2	1.466	1.090	1.8272	
15 minute winter	MQS 25.1	12.000	MQS 25	14.7	1.480	0.189	0.5660	
15 minute winter	MQS 25	11.004	MQS 26	134.9	1.915	1.554	2.0799	
15 minute winter	MQS 26.1	13.000	MQS 26	7.1	0.706	0.195	0.1888	
15 minute winter	MQS 26	11.005	SR 1	146.2	2.077	1.614	1.0666	
15 minute winter	SR 1	1.017	SR 2	265.4	1.675	1.164	3.5149	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	TS 1	11	26.613	0.763	34.1	1.0925	0.0000	SURCHARGED
15 minute winter	TS 2	11	26.452	1.007	56.2	1.4412	0.0000	SURCHARGED
15 minute winter	TS 3	11	26.128	0.930	78.7	1.3315	0.0000	SURCHARGED
15 minute summer	TS 4	10	25.506	1.369	82.6	1.9596	0.0000	SURCHARGED
30 minute winter	TS 5.1	25	24.590	0.504	171.7	68.8290	0.0000	SURCHARGED
15 minute winter	TS 5	9	25.389	1.489	216.9	2.1308	0.0000	FLOOD RISK
15 minute winter	TS 28	11	26.478	0.749	21.7	1.0716	0.0000	SURCHARGED
15 minute winter	TS 9	12	26.425	0.131	23.7	0.1478	0.0000	OK
15 minute winter	TS 10	11	26.385	1.292	73.9	1.4611	0.0000	SURCHARGED
15 minute summer	TS 12	10	25.744	1.350	77.6	1.5265	0.0000	SURCHARGED
15 minute summer	TS 13	10	25.512	1.942	102.4	2.1966	0.0000	SURCHARGED
15 minute summer	TS 14	10	25.430	2.047	108.3	2.3151	0.0000	SURCHARGED
15 minute winter	TS 15	11	27.882	0.567	41.8	0.8117	0.0000	SURCHARGED
15 minute winter	TS 16	11	27.857	0.609	60.5	0.8716	0.0000	SURCHARGED
15 minute winter	TS 17	11	27.784	0.622	97.6	0.8906	0.0000	SURCHARGED
15 minute winter	TS 18	11	27.319	0.412	96.9	0.4661	0.0000	SURCHARGED
15 minute winter	TS 19	10	26.996	0.379	127.9	0.5418	0.0000	SURCHARGED
15 minute summer	TS 20	1	27.796	0.000	0.0	0.0000	0.0000	OK
15 minute summer	TS 21	10	27.263	0.074	5.4	0.1064	0.0000	OK
480 minute winter	TS 22.1	464	26.867	0.448	10.1	86.3370	0.0000	SURCHARGED
15 minute summer	TS 22	9	27.254	0.836	97.5	0.9460	0.0000	SURCHARGED
15 minute winter	TS 23.1	9	27.426	0.759	17.2	0.8580	0.0000	SURCHARGED
15 minute winter	TS 23	9	27.370	1.139	41.5	1.2887	0.0000	SURCHARGED
15 minute summer	TS 24	9	27.383	1.292	7.6	1.4615	0.0000	SURCHARGED
15 minute summer	TS 25	10	26.830	1.313	142.9	1.4853	0.0000	SURCHARGED

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 winter	TS 1	14.000	TS 2	30.6	1.006	0.589	1.6146	
15 minute winter	TS 2	14.001	TS 3	53.8	1.352	1.037	0.9858	
15 minute winter	TS 3	14.002	TS 4	77.6	1.950	1.804	1.6092	
15 minute summer	TS 4	14.003	TS 5	91.8	1.304	0.826	1.6667	
30 minute winter	TS 5.1	15.000	TS 5	-171.7	-3.068	-7.704	0.1655	
15 minute winter	TS 5	14.004	TS 13	76.9	1.093	0.983	4.6470	
15 minute winter	TS 28	16.000	TS 10	31.9	1.162	0.574	1.4079	
15 minute winter	TS 9	17.000	TS 10	23.7	1.464	0.352	0.7527	
15 minute winter	TS 10	16.001	TS 12	71.2	1.790	1.522	1.4355	
15 minute summer	TS 12	16.002	TS 13	83.9	2.109	2.293	0.7489	
15 minute summer	TS 13	14.005	TS 14	77.5	1.101	0.991	2.6390	
15 minute summer	TS 14	14.006	TS 32	106.5	1.512	1.357	2.4549	
15 minute winter	TS 15	18.000	TS 16	38.3	0.728	0.488	0.9389	
15 minute winter	TS 16	18.001	TS 17	60.8	0.863	0.777	1.2133	
15 minute winter	TS 17	18.002	TS 18	96.9	1.376	1.237	3.5940	
15 minute winter	TS 18	18.003	TS 19	99.7	1.488	1.116	3.1462	
15 minute winter	TS 19	18.004	TS 25	129.8	2.203	0.839	0.7002	
15 minute summer	TS 20	19.000	TS 21	0.0	0.000	0.000	0.0000	
15 minute summer	TS 21	19.001	TS 22	8.4	0.747	0.232	0.3300	
480 minute winter	TS 22.1	20.000	TS 22	-10.1	-0.592	-0.423	0.1456	
15 minute summer	TS 22	19.002	TS 23	-46.2	-1.163	-1.286	1.5402	
15 minute winter	TS 23.1	21.000	TS 23	23.0	0.578	0.386	1.3246	
15 minute winter	TS 23	19.003	TS 24	15.8	0.525	0.376	0.8460	
15 minute summer	TS 24	19.004	TS 25	-22.8	-0.615	-0.501	0.3160	
15 minute summer	TS 25	18.005	TS 26	148.9	2.114	1.666	2.3533	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	TS 26.1	930	25.727	0.629	10.2	218.2016	0.0000	SURCHARGED
15 minute winter	TS 26	8	26.455	1.357	161.2	1.9415	0.0000	SURCHARGED
15 minute summer	TS 31	11	25.118	0.100	15.7	0.1131	0.0000	OK
15 minute winter	TS 32	10	25.115	1.907	134.8	2.1564	0.0000	SURCHARGED
15 minute winter	AS 13.1	10	25.132	0.082	15.5	0.0925	0.0000	OK
15 minute summer	AS 13	11	24.799	1.700	203.0	1.9223	0.0000	SURCHARGED
15 minute winter	SR 2	12	22.915	1.377	452.0	2.4332	0.0000	SURCHARGED
15 minute summer	SR 3	10	21.074	1.641	439.5	2.9003	0.0000	SURCHARGED
15 minute winter	KS1	12	21.702	1.606	156.7	15.4195	0.0000	FLOOD RISK
15 minute winter	KS2	12	21.671	1.654	123.4	1.8712	0.0000	SURCHARGED
15 minute winter	KS3	12	21.522	1.724	112.7	1.9497	0.0000	SURCHARGED
15 minute winter	KS4	10	23.351	0.142	27.1	0.2027	0.0000	OK
15 minute winter	KS5	11	23.199	0.186	35.8	0.2108	0.0000	OK
15 minute winter	KS6	11	23.039	0.155	71.8	0.2222	0.0000	OK
15 minute winter	KS7	12	21.449	1.714	209.7	1.9386	0.0000	SURCHARGED
15 minute winter	KS8	12	20.904	1.305	229.1	1.4756	0.0000	SURCHARGED
15 minute winter	KS9	9	20.676	1.147	242.8	1.2978	0.0000	SURCHARGED
15 minute winter	KS10	10	21.761	0.137	24.5	0.1967	0.0000	OK
15 minute winter	KS11	9	20.639	1.193	284.3	1.7071	0.0000	SURCHARGED
180 minute winter	KS12	172	20.415	1.055	131.5	391.5207	0.0000	SURCHARGED
180 minute winter	KS13	172	20.415	1.055	104.2	328.5392	0.0000	SURCHARGED
15 minute winter	KS14	9	20.450	1.089	535.8	1.9239	0.0000	SURCHARGED
15 minute summer	KS15	9	20.604	1.179	61.4	1.6876	0.0000	SURCHARGED
15 minute winter	KS16	10	21.797	0.160	59.3	0.1806	0.0000	OK
15 minute summer	KS17	10	20.424	1.194	217.7	2.1099	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	TS 26.1	22.000	TS 26	-10.2	-0.523	-0.192	0.3365	
15 minute winter	TS 26	18.006	TS 31	4.4	0.687	0.100	0.1181	
15 minute summer	TS 31	18.007	TS 32	15.7	1.123	0.291	0.8678	
15 minute winter	TS 32	14.007	AS 13	119.4	1.695	1.525	1.5365	
15 minute winter	AS 13.1	23.000	AS 13	15.2	1.049	0.286	1.4602	
15 minute summer	AS 13	14.008	SR 2	184.5	2.621	2.357	3.8904	
15 minute winter	SR 2	1.018	SR 3	452.2	2.854	2.462	7.3667	
15 minute summer	SR 3	1.019	SR 4	437.8	2.763	1.353	5.1101	
15 minute winter	KS1	24.000	KS2	-127.7	-1.158	-1.115	2.6329	
15 minute winter	KS2	24.001	KS3	92.5	0.839	0.805	7.2486	
15 minute winter	KS3	24.002	KS7	108.0	0.979	0.938	2.0792	
15 minute winter	KS4	25.000	KS5	26.7	0.871	0.729	1.1925	
15 minute winter	KS5	25.001	KS6	35.2	1.104	0.961	0.8278	
15 minute winter	KS6	25.002	KS7	71.5	2.554	0.752	0.9168	
15 minute winter	KS7	24.003	KS8	209.3	1.898	1.817	4.4783	
15 minute winter	KS8	24.004	KS9	228.7	2.074	1.989	2.3138	
15 minute winter	KS9	24.005	KS11	243.0	2.204	1.854	2.1174	
15 minute winter	KS10	26.000	KS11	23.7	0.978	0.647	0.7479	
15 minute winter	KS11	24.006	KS14	286.4	1.809	1.538	4.9675	
180 minute winter	KS12	27.000	KS14	-131.5	-1.484	-1.102	1.4475	
180 minute winter	KS13	28.000	KS14	-104.2	-1.288	-0.874	1.0454	
15 minute winter	KS14	24.007	KS17	-238.9	-1.509	-1.288	6.2495	
15 minute summer	KS15	29.000	KS17	92.8	0.595	0.457	7.7541	
15 minute winter	KS16	30.000	KS17	57.6	1.196	0.253	2.0635	
15 minute summer	KS17	24.008	KS18	-130.7	0.844	-0.700	3.9117	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SR 4	10	20.468	1.358	490.0	2.3988	0.0000	SURCHARGED
180 minute winter	SR 5.1	172	20.382	1.502	74.0	271.1453	0.0000	SURCHARGED
180 minute winter	SR 5	172	20.382	1.502	140.3	2.6541	0.0000	SURCHARGED
180 minute winter	SR 6	172	20.348	1.651	86.8	4.2010	0.0000	SURCHARGED
180 minute winter	SR 7	172	20.333	1.681	87.3	4.2793	0.0000	SURCHARGED
180 minute winter	Ex.S 6	172	17.917	0.187	87.3	0.2680	0.0000	OK
180 minute winter	Ex.S 7	172	17.776	0.168	87.3	0.0000	0.0000	OK
15 minute winter	KS18	9	20.477	1.330	141.9	1.9035	0.0000	SURCHARGED

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	SR 4	1.020	SR 5	466.6	2.945	1.683	4.9472	
180 minute winter	SR 5.1	31.000	SR 5	-74.0	-1.227	-0.621	0.4658	
180 minute winter	SR 5	1.021	SR 6	86.8	0.686	0.380	5.7827	
180 minute winter	SR 6	1.022	SR 7	86.8	0.548	0.381	1.4271	
180 minute winter	SR 7	1.023	Ex.S 6	87.3	1.276	0.383	0.7661	
180 minute winter	Ex.S 6	1.024	Ex.S 7	87.3	1.501	0.307	0.9137	998.7
15 minute winter	KS18	24.009	SR 4	-141.9	-0.895	-0.764	1.7600	

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Appendix C HR Wallingford Greenfield Runoff Rate Report

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Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

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Calculated by:	Michael Naughton
Site name:	Kingston Stables
Site location:	Kingston, Galway

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.26758° N
Longitude:	9.09988° W
Reference:	3056089139
Date:	Feb 04 2025 10:59

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 8.74

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	1272	1272
Hydrological region:	13	13
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.65	1.65
Growth curve factor 100 years:	1.95	1.95
Growth curve factor 200 years:	2.15	2.15

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	32.04	32.04
1 in 1 year (l/s):	27.23	27.23
1 in 30 years (l/s):	52.86	52.86
1 in 100 year (l/s):	62.47	62.47
1 in 200 years (l/s):	68.88	68.88

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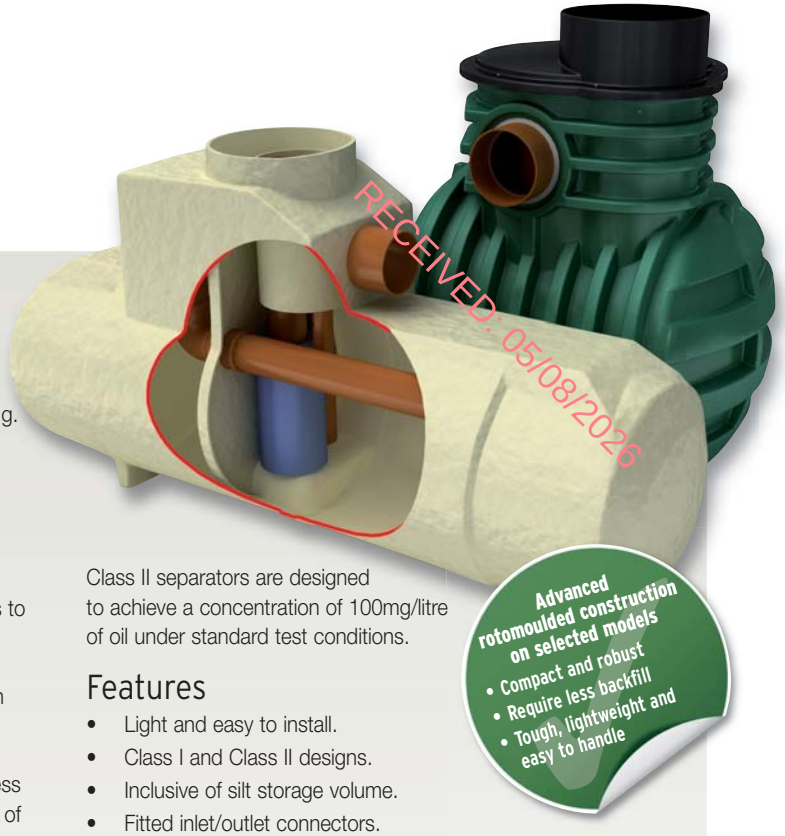
This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Appendix D Kingspan Klargester Bypass Separator

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Bypass Separator

NSBP Range



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Application

Bypass separators are used when it is considered an acceptable risk not to provide full treatment, for very high flows, and are used, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small, e.g.

- Surface car parks.
- Roadways.
- Lightly contaminated commercial areas.

Performance

Klargester Environmental were one of the first UK manufacturers to have separators tested to EN 858-1 and have now added the NSBP bypass range to their portfolio of certified and tested models. The NSBP number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Klargester full retention separators and certified their performance in relation to their flow and process performance assessing the effluent qualities to the requirements of BS EN 858-1. Klargester bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Oil storage volume.
- Silt storage capacity.
- Coalescer.

The unit is designed to treat 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3 NSB = 0.0018A(m^2).
Flows generated by higher rainfall rates will pass through part of the separator and bypass the main separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.

Class II separators are designed to achieve a concentration of 100mg/litre of oil under standard test conditions.

Advanced rotomoulded construction on selected models
- Compact and robust
- Require less backfill
- Tough, lightweight and easy to handle

Features

- Light and easy to install.
- Class I and Class II designs.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Oil alarm system available (required by BS EN 858-1 and PPG3).
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size bypass separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped .
- The required discharge standard. This will decide whether a Class I or Class II unit is required.
- The drain invert inlet depth.
- Pipework type, size and orientation.

Sizes & Specifications:

Unit Nominal Size	Flow (l/s)	Peak Flow Rate (l/s)	Drainage Area (m^2)	Storage Capacity (litres) Silt	Oil	Unit Length (mm)	Unit Dia. (mm)	Access Shaft Diameter (mm)	Base to Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across Unit	Min. Inlet Invert (mm)	Standard Pipework Diameter (mm)
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	315
NSBP004	4.5	45	2500	450	68	1700	1350	600	1420	1320	100	500	315
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	315
NSBP008	8	80	4445	800	120	3065	1225	750	1450	1350	100	500	315
NSBP010	10	100	5560	1000	150	3065	1225	750	1450	1350	100	500	315
NSBP012	12	120	6670	1200	180	3915	1225	750	1450	1350	100	500	315
NSBP015	15	150	8335	1500	225	3915	1225	750	1450	1350	100	500	315
NSBP018	18	180	10000	1800	270	3200	2012	600	2110	2010	100	1000	375
NSBP024	24	240	13340	2400	360	3200	2012	600	2110	2010	100	1000	375
NSBP030	30	300	16670	3000	450	3915	2012	600	2110	2010	100	1000	450
NSBP036	36	360	20000	3600	540	3915	2012	600	2110	2010	100	1000	525
NSBP055	55	550	30560	5500	825	5085	2820	600	2310	2060	250	1000	750
NSBP072	72	720	40000	7200	1080	5820	2820	600	2310	2060	250	1500	750
NSBP084	84	840	46670	8400	1260	6200	2820	600	2310	2010	300	1500	750
NSBP096	96	960	53340	9600	1440	7375	2820	600	2310	2010	300	1500	825
NSBP110	110	1100	61110	11000	1650	7925	2820	600	2360	2010	350	1500	825
NSBP130	130	1300	72225	13000	1950	8725	2820	600	2360	2010	350	1500	825

Rotomoulded chamber construction *GRP chamber construction*

Appendix E Uisce Eireann Correspondence

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CONFIRMATION OF FEASIBILITY

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

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

Michael Naughton

TOBIN
Fairgreen House
Fairgreen Road
Galway
H91AXK8

24 March 2026

Our Ref: CDS26001767 Pre-Connection Enquiry
Kingston Lands, Galway

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 140 unit(s) at Site At, Kingston Lands, Galway, Galway, (the **Development)**.

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

- **Water Connection**
  - Feasible without infrastructure upgrade by Uisce Éireann
  - The customer's property is located on a private road leading to their house therefore the customer is responsible for installing their service pipe from the edge of the public road to their development. The Customer shall obtain any permissions/consents/wayleaves (if required) for the pipe route from their house to the edge of the public road.

    Please note that according to our records there is an existing water main and sewer running through this site (see drawing attached).
    Any structures or works over or in close

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

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		proximity to Uisce Eireann infrastructure that will inhibit access for maintenance or endanger structural or functional integrity of the infrastructure are not allowed. The layout of the development must ensure that this pipe is protected and adequate separation distances are provided between Uisce Eireann infrastructure and any structures on site. Alternatively, you may enter into a diversion agreement with Uisce Eireann and divert the pipe to accommodate your development. If you wish to proceed with this option, please contact Uisce Eireann at Diversions@water.ie and submit detailed design drawings before submitting your planning application. It will be necessary to provide a wayleave over this pipe to the benefit of Uisce Eireann and ensure that it is accessible for maintenance. For more information, please see go to the link below: https://www.water.ie/connections/developer-services/diversions/
• **Wastewater Connection**	-	Feasible without infrastructure upgrade by Uisce Éireann
	-	Customer proposes to connect into a 300mm foul sewer permitted under planning ref 24/60370 by GCC. Connections via third party owned assets can be permitted subject to the following conditions: • Written agreement should be obtained by the Customer from the 3rd party giving permission to the Customer to connect via 3rd party infrastructure. Can Consents be provided to UE at this point. • Confirmation shall be provided by the new customer, supported by design calculations (if required), that the 3rd party infrastructure has capacity and is structurally adequate. If IW deems a high level of risk involved, further information should be sought such as condition survey/CCTV survey, etc. • It should be made clear to all parties that the 3rd party infrastructure remains classified as a service connection and is not assumed by any party to be adopted/taken in charge by Uisce Eireann following the

new connection being made, unless it is expressly stated otherwise.
• The new customer and the 3rd party shall be treated individually for metering purposes.
• The Customer shall obtain a Wayleave (in favour of themselves) over the 3rd party infrastructure where possible. However this is not a requirement that should prevent the connection being made if a wayleave is not forthcoming.

Please note that according to our records there is an existing water main and sewer running through this site (see drawing attached).
Any structures or works over or in close proximity to Uisce Eireann infrastructure that will inhibit access for maintenance or endanger structural or functional integrity of the infrastructure are not allowed.
The layout of the development must ensure that this pipe is protected and adequate separation distances are provided between Uisce Eireann infrastructure and any structures on site. Alternatively, you may enter into a diversion agreement with Uisce Eireann and divert the pipe to accommodate your development. If you wish to proceed with this option please contact

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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)

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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?

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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

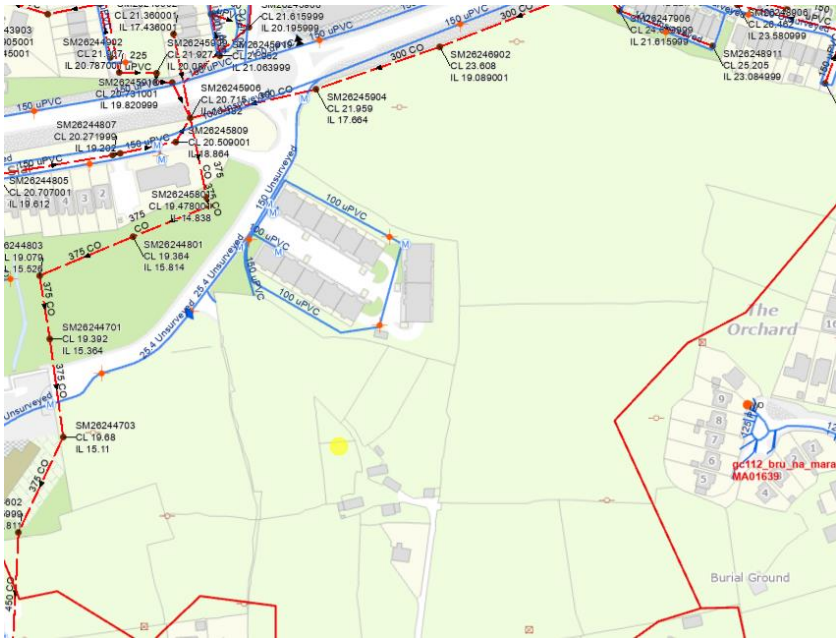
What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** available 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)

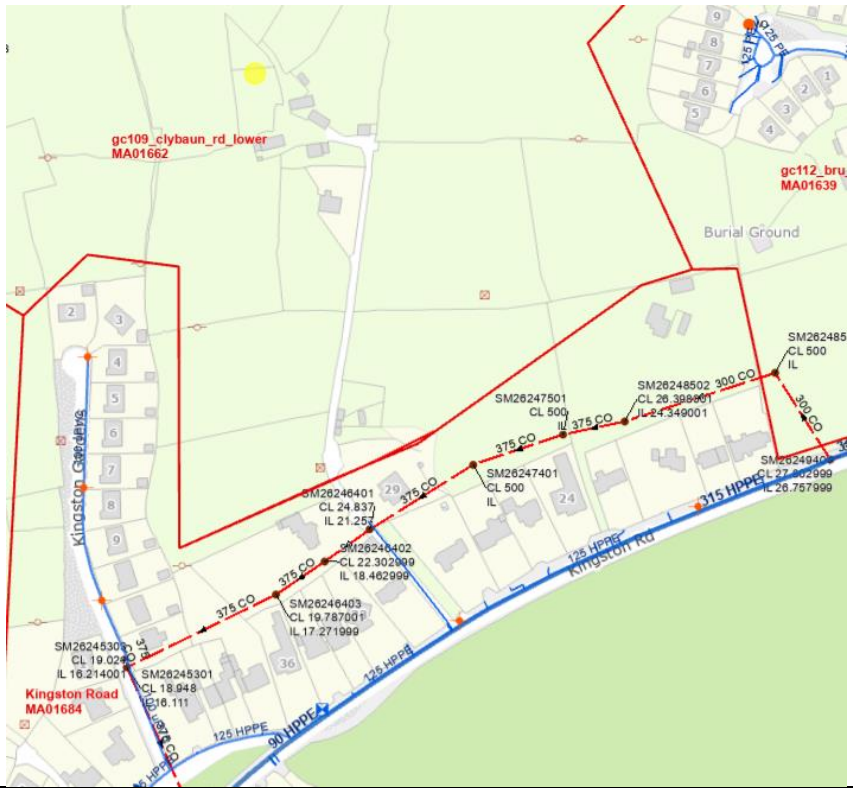
RECEIVED: 08/08/2026

RECEIVED 05/08/2026

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.

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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.

Michael Naughton
TOBIN
Fairgreen House
Fairgreen Road
Galway
H91AXK8

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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

10 July 2026

Re: Design Submission for Site At, Kingston Lands, Galway, (the "Development") (the "Design Submission") / Connection Reference No: CDS26001767

Dear Michael Naughton,

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: Gift Mzembe
Phone:
Email: gift.mzembe@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
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.

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Appendix A

Document Title & Revision

- 11893-2100 Key Plan

- 11893-2101 Proposed Drainage Layout Sheet 1 of 3
- 11893-2102 Proposed Drainage Layout Sheet 2 of 3
- 11893-2103 Proposed Drainage Layout Sheet 3 of 3
- 11893 - Kingston LRD West Foul Network Long sections

- 11893-2104 Proposed Watermain Layout Sheet 1 of 3
- 11893-2105 Proposed Watermain Layout Sheet 2 of 3
- 11893-2106 Proposed Watermain Layout Sheet 3 of 3

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 the Code of Practice for water infrastructure.

*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.

Appendix F Soakaway Testing Locations and Results

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Legend Key

- Locations By Type - CP
- Locations By Type - DCP
- Locations By Type - RC
- Locations By Type - RO
- Locations By Type - TP

Project No.	24-0211
Client	Kingston Lands, Galway
Client's Rep	King Construction

Site Location Plan

Kingston Lands, Galway

CAUSEWAY GEOTECH

Last Revision	04/06/2025
Scale	1:3000

Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA01
Test Date: 04 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	1.40	2.45
test pit base dimensions	1.40	2.20
test pit depth (m)	1.80	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	1.00	0.80
2	1.05	0.75
4	1.05	0.75
6	1.05	0.75
8	1.10	0.70
10	1.17	0.63
14	1.22	0.58
18	1.25	0.55
22	1.30	0.50
26	1.39	0.41
31	1.39	0.41
36	1.45	0.35
46	1.54	0.26
56	1.80	0.00

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.60 m
depth to water surface (target) 1.20 m
time to reach target depth 12.0 mins

Test end

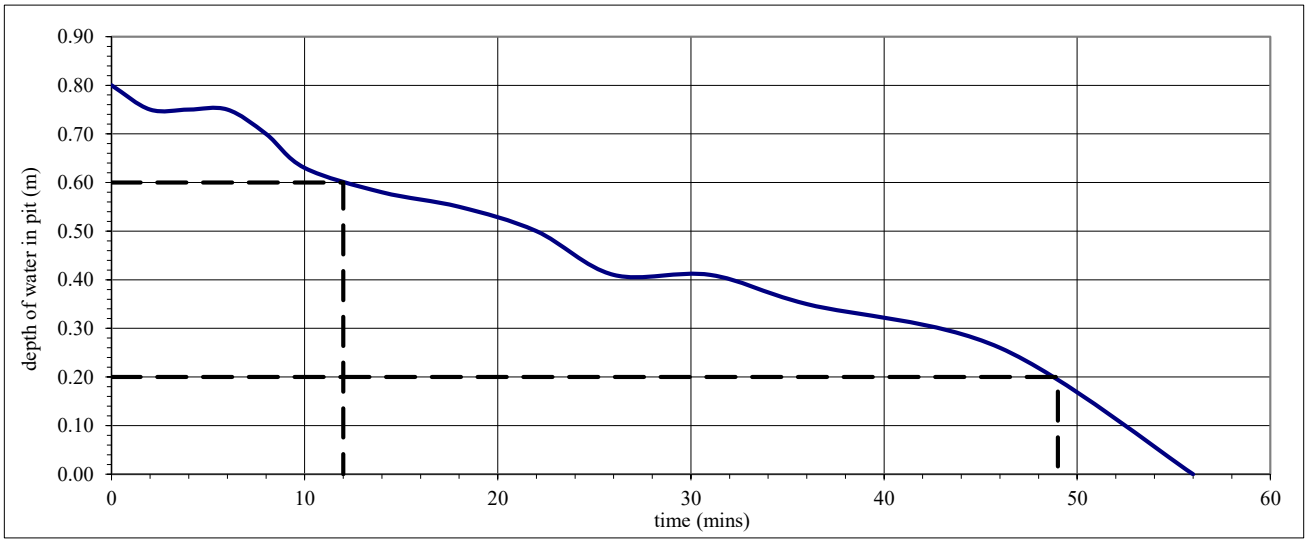
25% head of water at 0.20 m
depth to water surface (target) 1.60 m
time to reach target depth 49.0 mins

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Test infiltration rate (f) = 9.50E-05 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
12	1.20	0.60	37	1.26	5.99	5.7E-03	0.342
49	1.60	0.20					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA02
Test Date: 04 June 2025

RECEIVED: 06/08/2026

	width (m)	length (m)
test pit top dimensions	1.90	3.35
test pit base dimensions	1.55	2.85
test pit depth (m)	1.80	

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	1.00	0.80
2	1.04	0.76
4	1.05	0.75
6	1.06	0.74
8	1.10	0.70
11	1.17	0.63
13	1.22	0.58
15	1.25	0.55
18	1.30	0.50
23	1.38	0.42
28	1.40	0.40
33	1.45	0.35
40	1.54	0.26
50	1.60	0.20
62	1.68	0.12

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.60 m

depth to water surface (target) 1.20 m

time to reach target depth 12.0 mins

Test end

25% head of water at 0.20 m

depth to water surface (target) 1.60 m

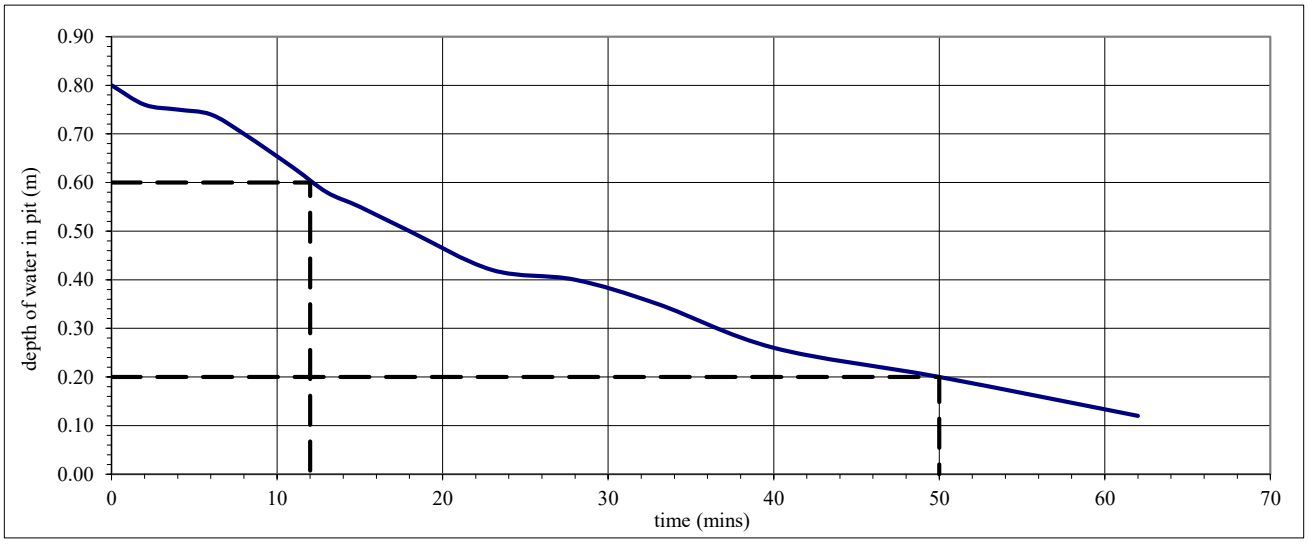
time to reach target depth 50.0 mins

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Test infiltration rate (f) = 1.05E-04 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
12	1.20	0.60	38	1.93	8.03	6.3E-03	0.379
50	1.60	0.20					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA03
Test Date: 04 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	3.15	3.70
test pit base dimensions	3.15	3.70

test pit depth (m) 1.30

depth to groundwater before adding water (m) = 0.60

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.55	0.05
5	0.55	0.05
10	0.55	0.05
20	0.55	0.05
34	0.54	0.06
49	0.50	0.10

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.04 m
depth to water surface (target) 0.56 m
time to reach target depth not reached

Test end

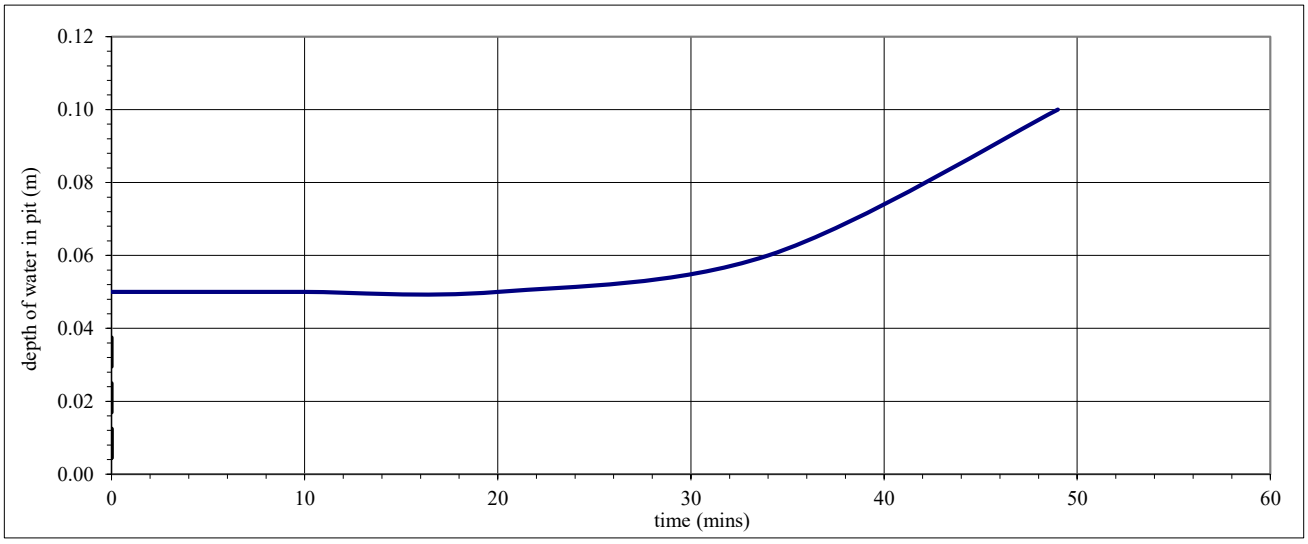
25% head of water at 0.01 m
depth to water surface (target) 0.59 m
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Infiltration rate (f) not calculated
(water level rose during course of test)

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
	0.56	0.04	N/A				
	0.59	0.01					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA04
Test Date: 04 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	2.10	3.05
test pit base dimensions	1.80	2.60
test pit depth (m)	1.55	

depth to groundwater before adding water (m) = 1.01

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.25	0.76
5	0.28	0.73
25	0.36	0.65
53	0.40	0.61
61	0.40	0.61

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.57 m
depth to water surface (target) 0.44 m
time to reach target depth not reached

Test end

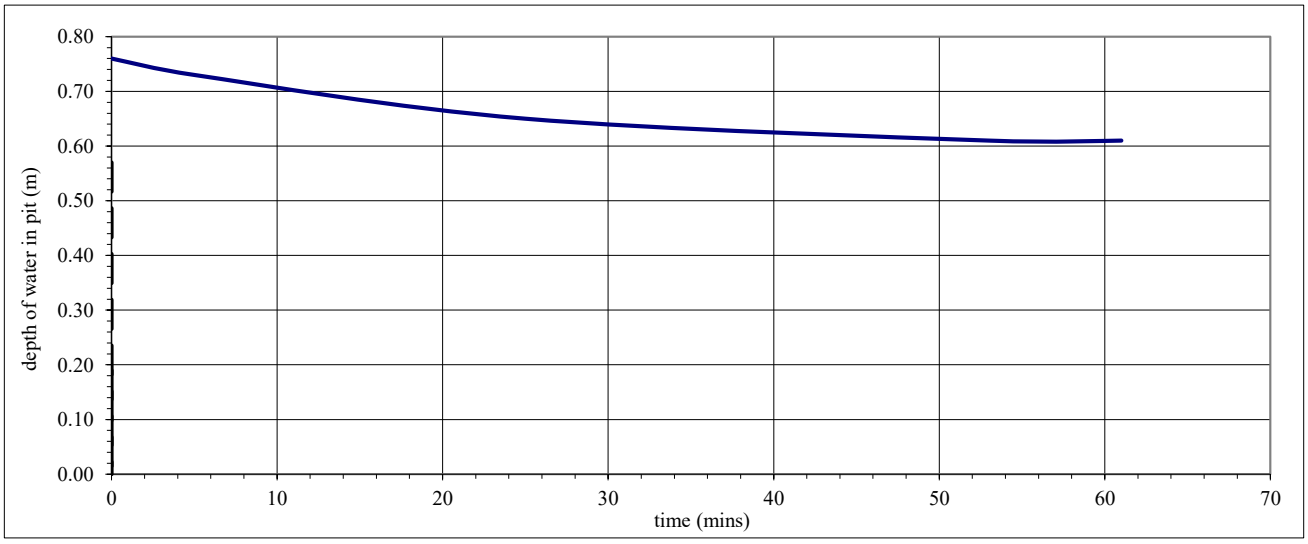
25% head of water at 0.19 m
depth to water surface (target) 0.82 m
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
	0.44	0.57	N/A				
	0.82	0.19					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA05
Test Date: 06 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	2.10	3.55
test pit base dimensions	2.10	2.30
test pit depth (m)	1.55	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.60	0.95
10	0.69	0.86
20	0.76	0.79
30	0.83	0.72
50	0.88	0.67
79	0.95	0.60

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.71 m
depth to water surface (target) 0.84 m
time to reach target depth 32.0 mins

Test end

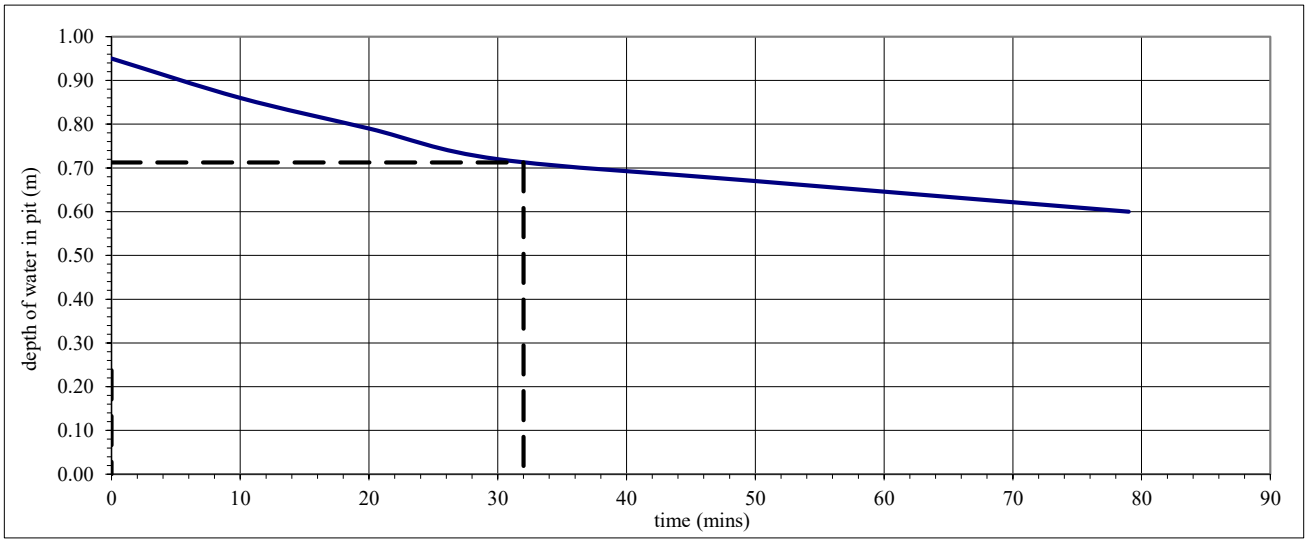
25% head of water at 0.24 m
depth to water surface (target) 1.31 m
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
32	0.84	0.71	N/A				
	1.31	0.24					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA06
Test Date: 06 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	1.60	2.15
test pit base dimensions	1.60	1.30
test pit depth (m)	0.80	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.40	0.40
4	0.44	0.36
9	0.47	0.33
20	0.49	0.31
28	0.50	0.30
41	0.52	0.28
66	0.56	0.24
78	0.57	0.23
93	0.59	0.21

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.30 m
depth to water surface (target) 0.50 m
time to reach target depth 28.0 mins

Test end

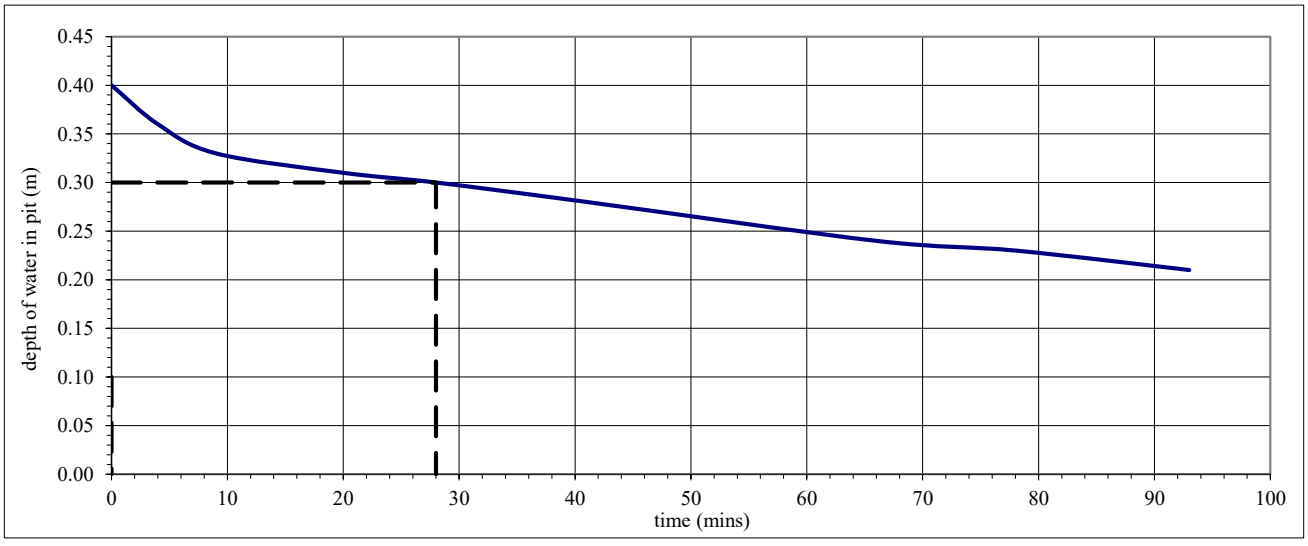
25% head of water at 0.10 m
depth to water surface (target) 0.70 m
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
28	0.50	0.30	N/A				
	0.70	0.10					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA07
Test Date: 06 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	2.10	4.10
test pit base dimensions	1.70	2.20
test pit depth (m)	1.90	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.60	1.30
7	0.75	1.15
16	0.80	1.10
24	0.83	1.07
28	0.85	1.05
40	0.94	0.96
48	1.01	0.89
61	1.04	0.86

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.98 m
depth to water surface (target) 0.93 m
time to reach target depth 38.0 mins

Test end

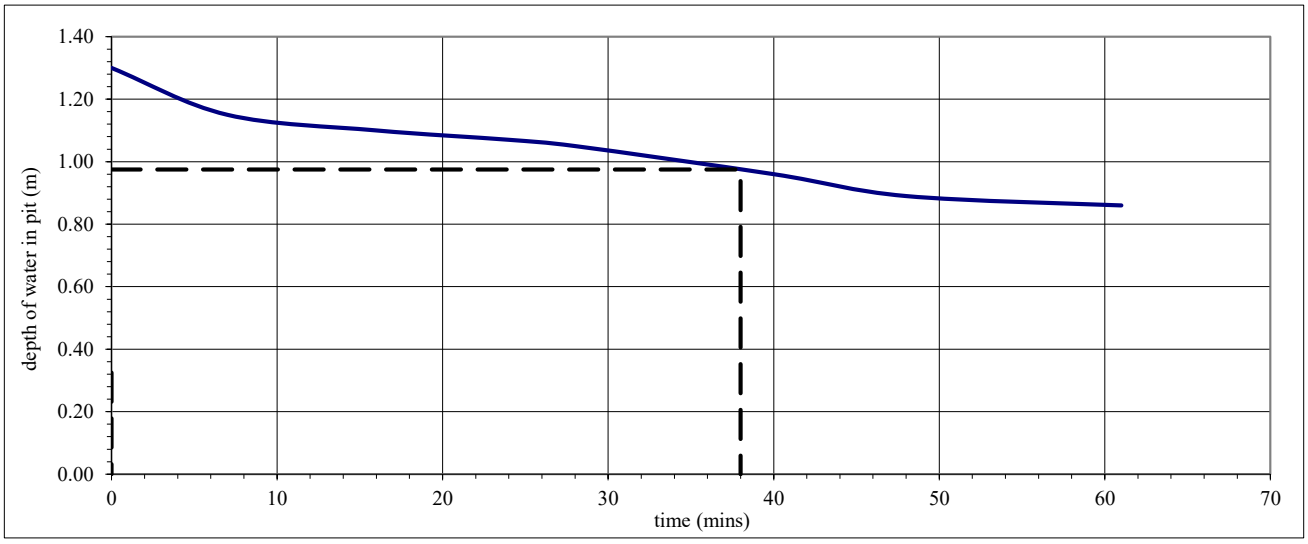
25% head of water at 0.33 m
depth to water surface (target) 1.58 m
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
38	0.93	0.98	N/A				
	1.58	0.33					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA08 (A)
Test Date: 06 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	3.05	2.65
test pit base dimensions	1.70	2.15
test pit depth (m)	2.20	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.90	1.30
2	1.15	1.05
4	1.30	0.90
6	1.41	0.79
18	2.19	0.01

RESULTS (FROM GRAPH BELOW)

Test start
75% head of water at 0.98 m
depth to water surface (target) 1.23 m
time to reach target depth 3.0 mins

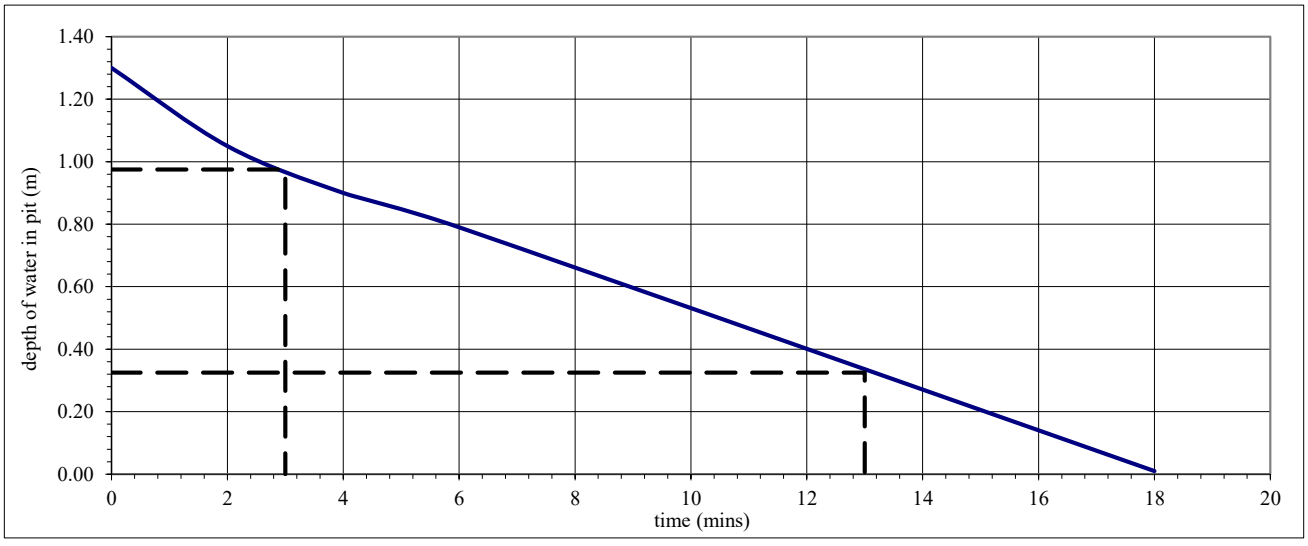
Test end
25% head of water at 0.33 m
depth to water surface (target) 1.88 m
time to reach target depth 13.0 mins

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Test infiltration rate (f) = 5.76E-04 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
3	1.23	0.98	10	3.14	9.10	3.5E-02	2.072
13	1.88	0.33					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA08 (B)
Test Date: 06 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	3.05	2.65
test pit base dimensions	1.70	2.15
test pit depth (m)	2.20	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.80	1.40
3	0.97	1.23
4	1.06	1.14
5	1.10	1.10
7	1.20	1.00
9	1.27	0.93
13	1.37	0.83
17	1.49	0.71
20	1.56	0.64
26	1.62	0.58
65	1.90	0.30

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 1.05 m
depth to water surface (target) 1.15 m
time to reach target depth 6.0 mins

Test end

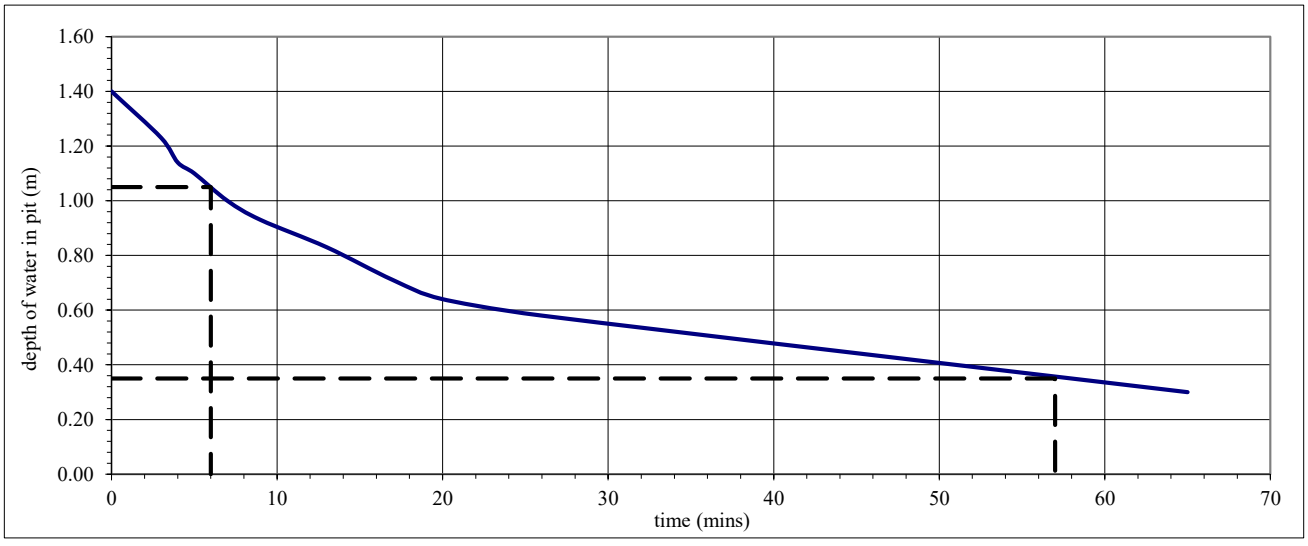
25% head of water at 0.35 m
depth to water surface (target) 1.85 m
time to reach target depth 57.0 mins

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Test infiltration rate (f) = 1.18E-04 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
6	1.15	1.05	51	3.45	9.56	7.1E-03	0.425
57	1.85	0.35					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA08 (C)
Test Date: 06 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	3.05	2.65
test pit base dimensions	1.70	2.15
test pit depth (m)	2.20	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.69	1.51
2	0.80	1.40
13	1.20	1.00
18	1.33	0.87
24	1.43	0.77
35	1.60	0.60
55	1.77	0.43
75	1.86	0.34

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 1.13 m
depth to water surface (target) 1.07 m
time to reach target depth 9.0 mins

Test end

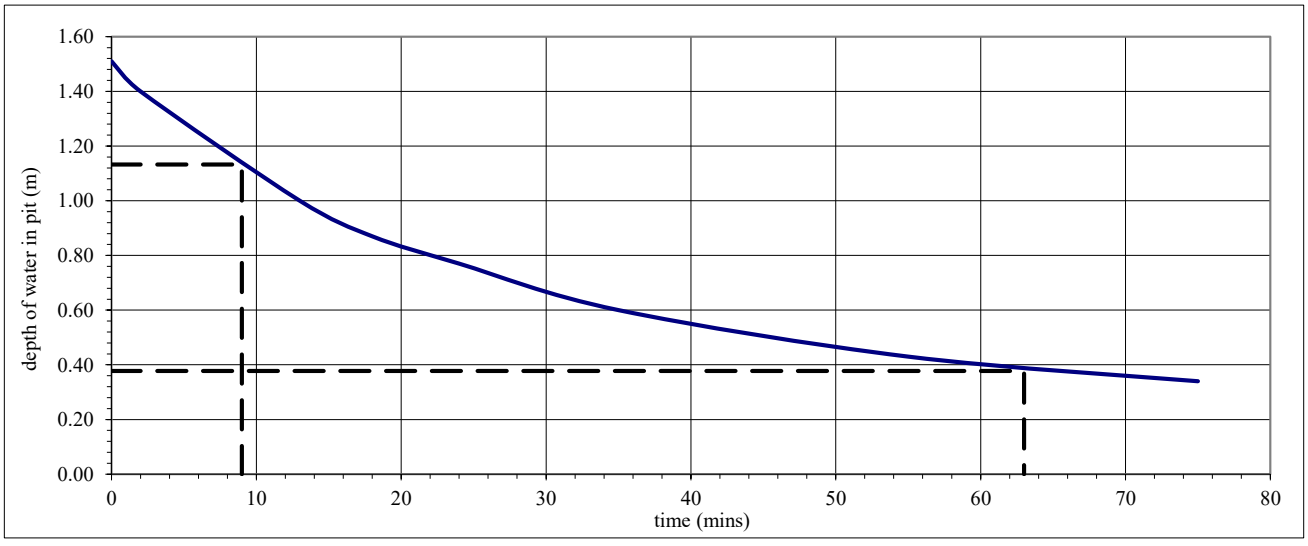
25% head of water at 0.38 m
depth to water surface (target) 1.82 m
time to reach target depth 63.0 mins

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Test infiltration rate (f) = 1.17E-04 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
9	1.07	1.13	54	3.81	10.07	7.0E-03	0.420
63	1.82	0.38					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA09
Test Date: 05 June 2025

RECEIVED: 06/08/2026

	width (m)	length (m)
test pit top dimensions	2.25	3.00
test pit base dimensions	2.25	3.00
test pit depth (m)	1.20	

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

depth to groundwater before adding water (m) = 0.65

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.49	0.16
7	0.50	0.15
22	0.51	0.14
44	0.52	0.13
60	0.54	0.11
76	0.55	0.10

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.12 m

depth to water surface (target) 0.53 m

time to reach target depth 52.0 mins

Test end

25% head of water at 0.04 m

depth to water surface (target) 0.61 m

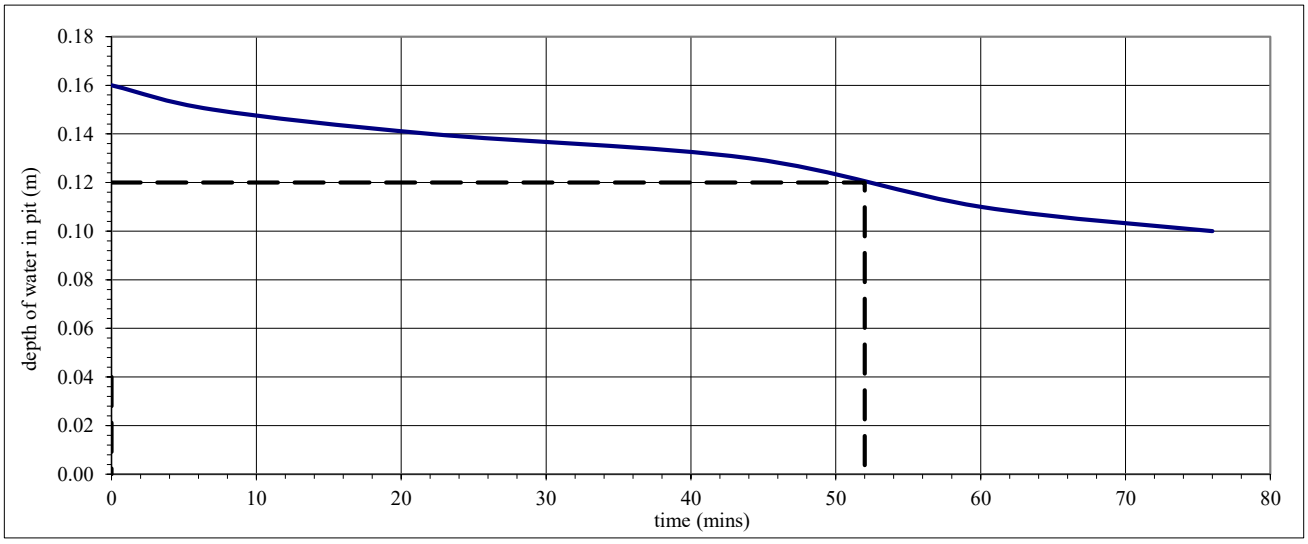
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
52	0.53	0.12	N/A				
	0.61	0.04					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA10
Test Date: 05 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	1.50	3.30
test pit base dimensions	1.40	1.50
test pit depth (m)	1.40	

depth to groundwater before adding water (m) = 1.35

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.50	0.85
2	0.55	0.80
4	0.70	0.65
8	0.77	0.58
16	0.84	0.51
20	0.85	0.50
31	0.88	0.47
37	0.94	0.41
41	0.96	0.39
51	0.97	0.38
69	1.02	0.33
85	1.10	0.25
96	1.14	0.21
106	1.15	0.20

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.64 m
depth to water surface (target) 0.71 m
time to reach target depth 4.0 mins

Test end

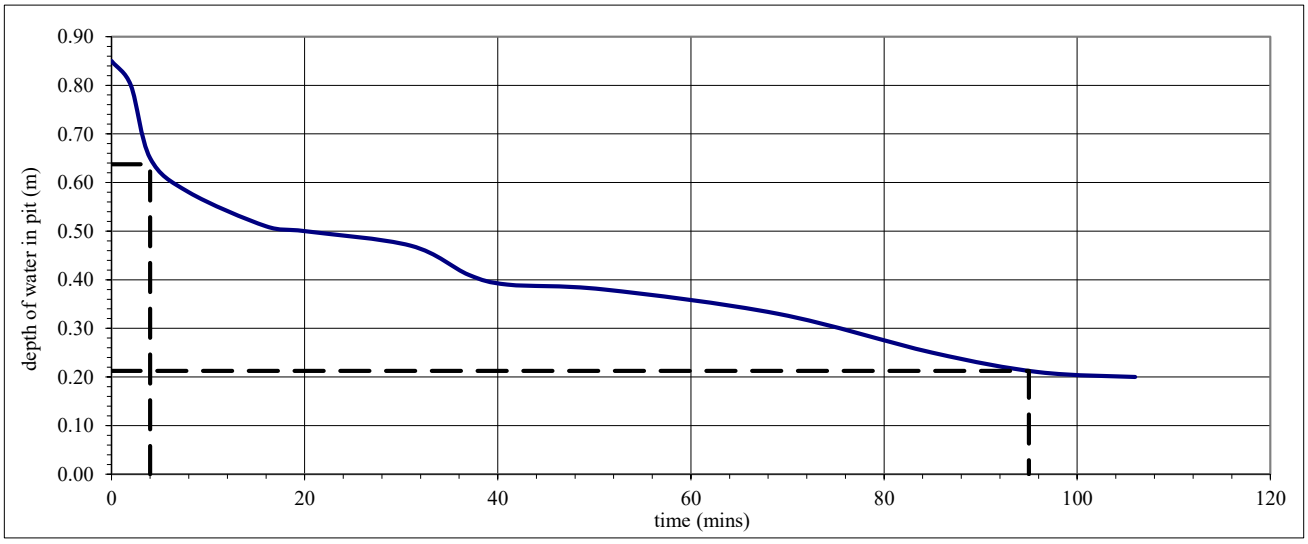
25% head of water at 0.21 m
depth to water surface (target) 1.14 m
time to reach target depth 95.0 mins

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Test infiltration rate (f) = 4.52E-05 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
4	0.71	0.64	91	1.29	5.22	2.7E-03	0.163
95	1.14	0.21					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA11
Test Date: 05 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	1.80	2.65
test pit base dimensions	1.80	2.30
test pit depth (m)	1.15	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.40	0.75
5	0.44	0.71
16	0.50	0.65
26	0.57	0.58
42	0.61	0.54
55	0.63	0.52
75	0.67	0.48
92	0.70	0.45
114	0.76	0.39
121	0.78	0.37

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.56 m

depth to water surface (target) 0.59 m

time to reach target depth 33.0 mins

Test end

25% head of water at 0.19 m

depth to water surface (target) 0.96 m

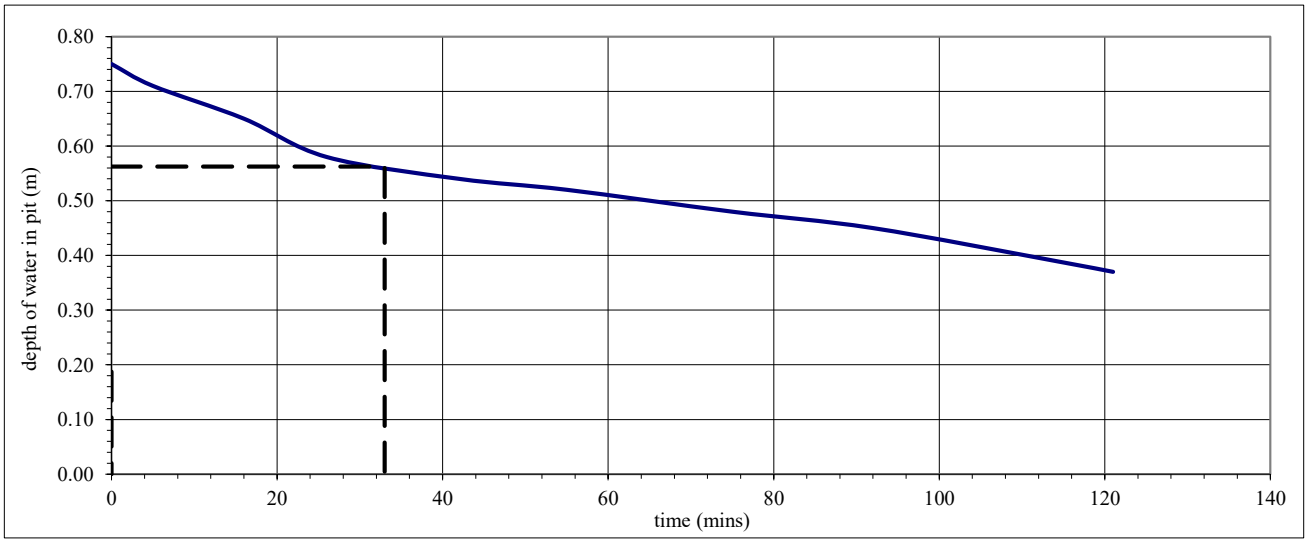
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
33	0.59	0.56	N/A				
	0.96	0.19					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA12
Test Date: 09 June 2025

RECEIVED: 06/08/2026

	width (m)	length (m)
test pit top dimensions	1.50	2.65
test pit base dimensions	1.50	1.15
test pit depth (m)	1.60	

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.30	1.30
26	1.00	0.60
55	1.45	0.15
109	1.60	0.00

RESULTS (FROM GRAPH BELOW)

Test start
75% head of water at 0.98 m
depth to water surface (target) 0.63 m
time to reach target depth 11.0 mins

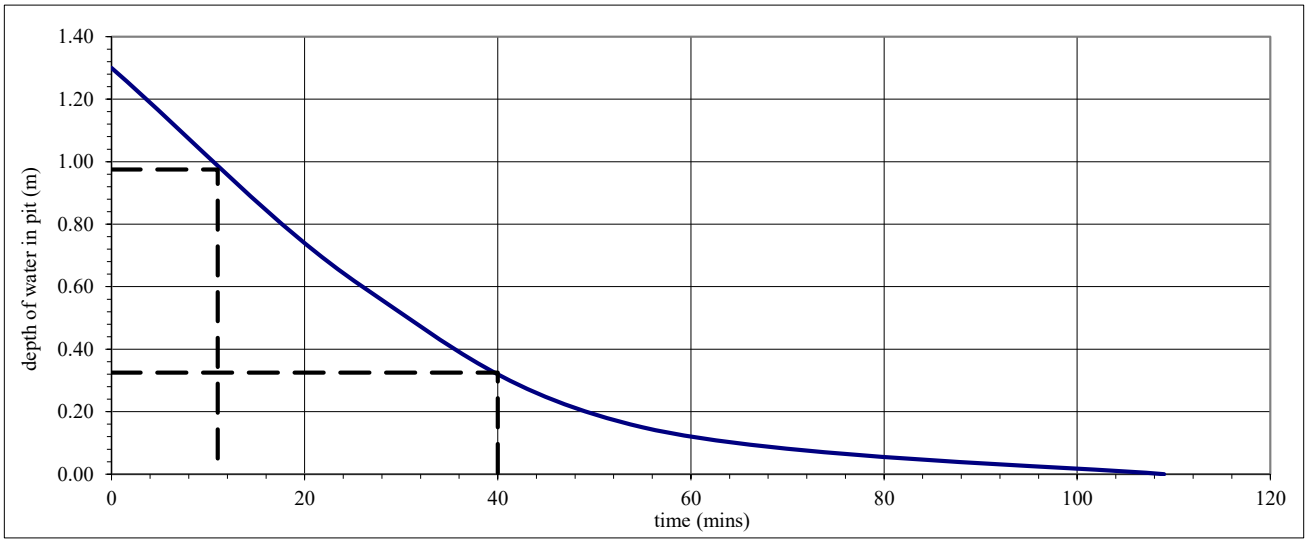
Test end
25% head of water at 0.33 m
depth to water surface (target) 1.28 m
time to reach target depth 40.0 mins

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Test infiltration rate (f) = 1.74E-04 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
11	0.63	0.98	29	1.72	5.67	1.0E-02	0.626
40	1.28	0.33					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA13
Test Date: 09 June 2025

RECEIVED: 06/08/2026

	width (m)	length (m)
test pit top dimensions	2.80	3.40
test pit base dimensions	1.90	2.00
test pit depth (m)	2.10	

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.95	1.15
78	1.11	0.99
104	1.18	0.92
140	1.30	0.80
155	1.58	0.52
170	1.73	0.37
253	1.76	0.34

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.86 m
depth to water surface (target) 1.24 m
time to reach target depth 127.0 mins

Test end

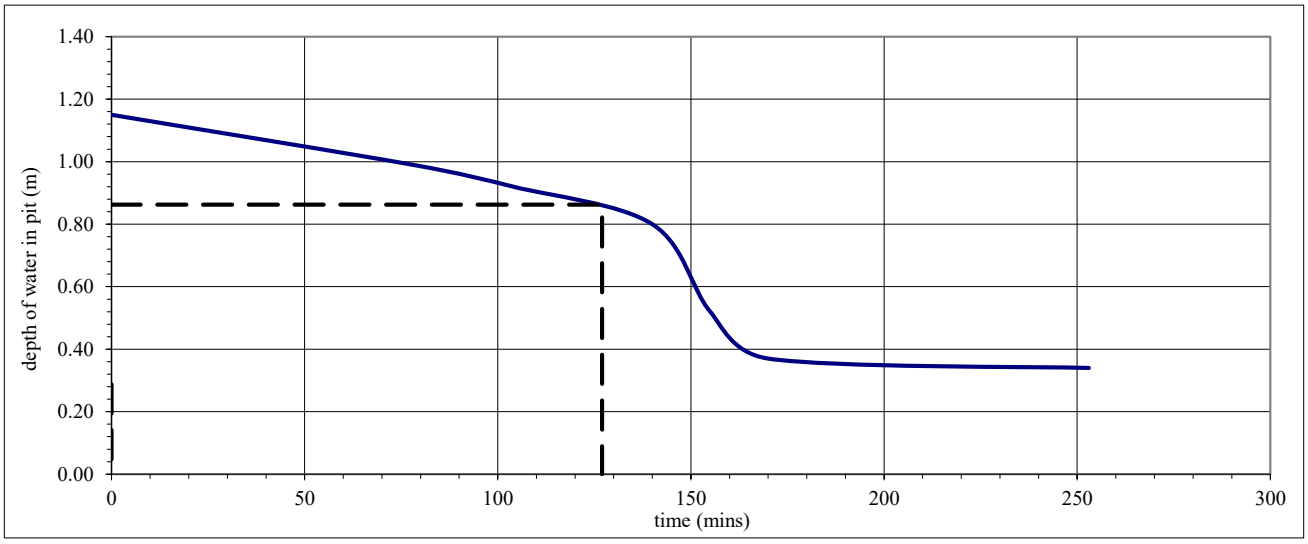
25% head of water at 0.29 m
depth to water surface (target) 1.81 m
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
127	1.24	0.86	N/A				
	1.81	0.29					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA15
Test Date: 09 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	1.80	3.45
test pit base dimensions	1.80	2.50
test pit depth (m)	0.65	

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.05	0.60
9	0.10	0.55
31	0.15	0.50
55	0.16	0.49
125	0.22	0.43
159	0.22	0.43
188	0.23	0.42
218	0.24	0.41
301	0.29	0.36

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.45 m
depth to water surface (target) 0.20 m
time to reach target depth 100.0 mins

Test end

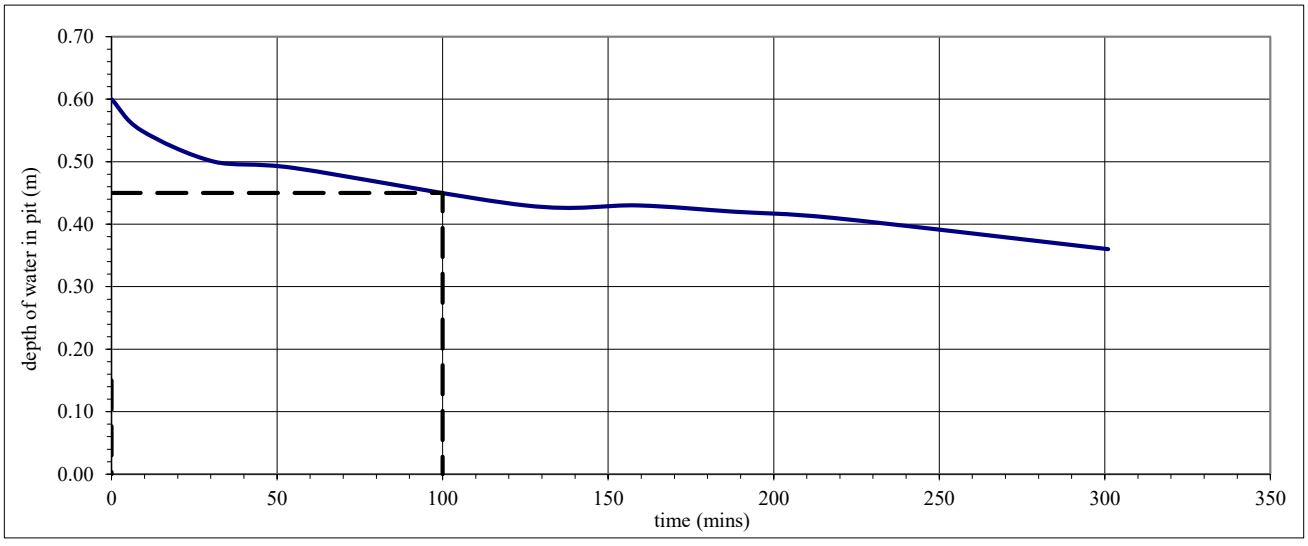
25% head of water at 0.15 m
depth to water surface (target) 0.50 m
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
100	0.20	0.45	N/A				
	0.50	0.15					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA16
Test Date: 09 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	1.80	2.50
test pit base dimensions	1.80	1.15

test pit depth (m) 2.00

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.60	1.40
20	0.68	1.32
39	0.73	1.27
112	0.88	1.12
142	0.90	1.10
175	1.00	1.00
205	1.06	0.94
288	1.16	0.84

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 1.05 m

depth to water surface (target) 0.95 m

time to reach target depth 159.0 mins

Test end

25% head of water at 0.35 m

depth to water surface (target) 1.65 m

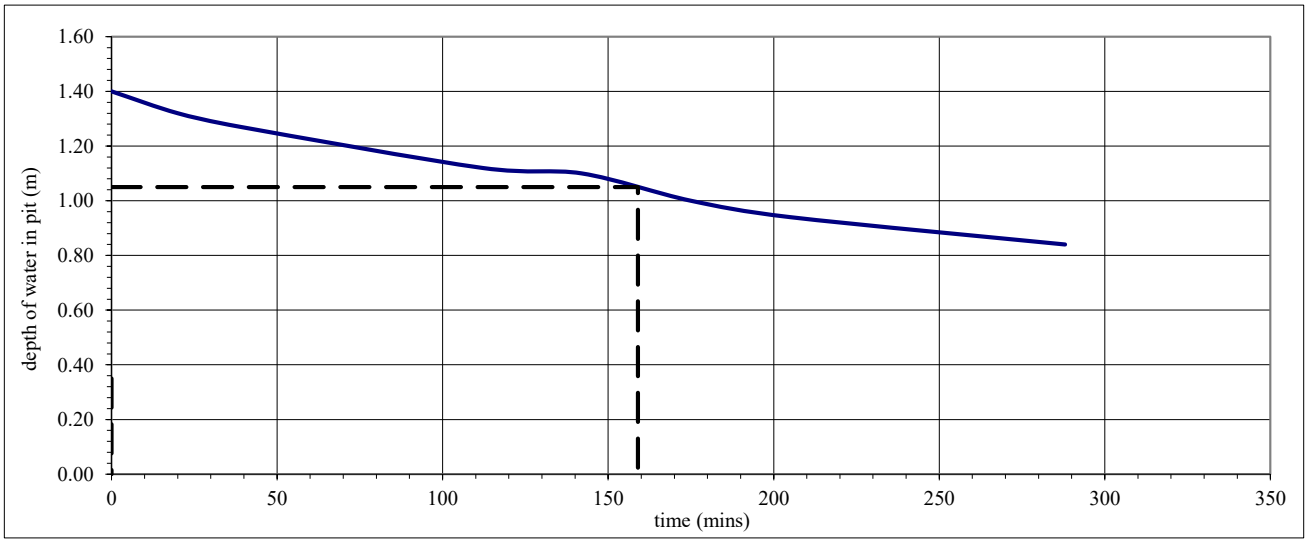
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
159	0.95	1.05	N/A				
	1.65	0.35					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA18
Test Date: 05 June 2025

RECEIVED: 06/08/2026

	width (m)	length (m)
test pit top dimensions	1.60	2.35
test pit base dimensions	1.60	1.10
test pit depth (m)	1.20	

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.50	0.70
5	0.55	0.65
16	0.58	0.62
30	0.66	0.54
79	0.98	0.22
96	1.07	0.13
110	1.12	0.08
120	1.19	0.01

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.53 m
depth to water surface (target) 0.68 m
time to reach target depth 32.0 mins

Test end

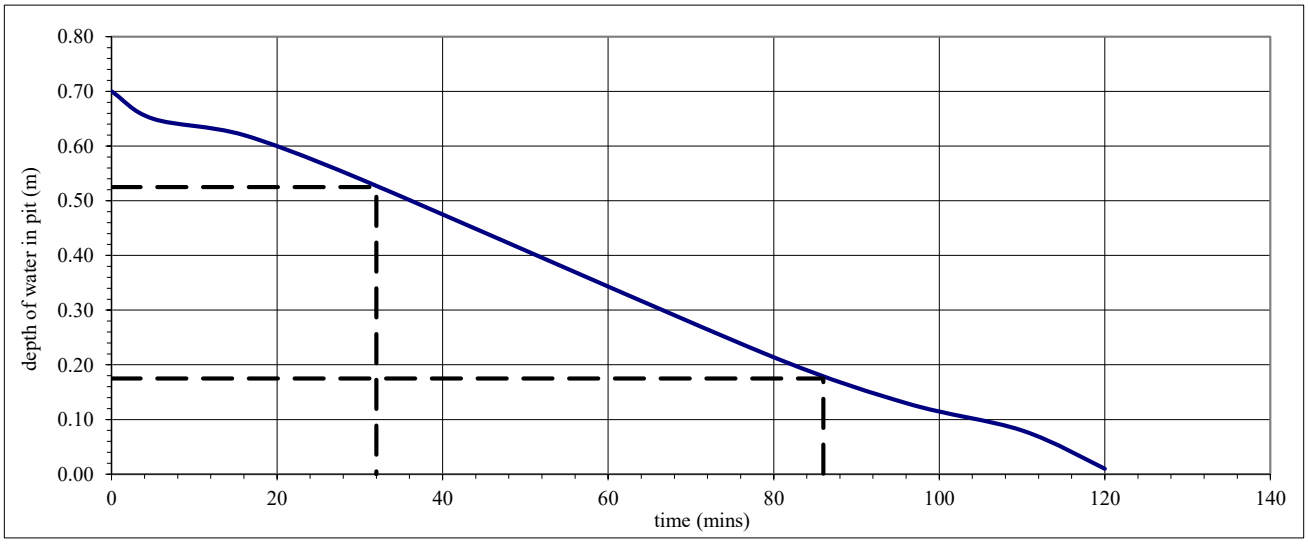
25% head of water at 0.18 m
depth to water surface (target) 1.03 m
time to reach target depth 86.0 mins

soil infiltration rate $f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$

Test infiltration rate (f) = 6.64E-05 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, t_{p75-25} (mins)	Volume of water lost, V_{p75-25} (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
32	0.68	0.53	54	0.82	3.81	4.0E-03	0.239
86	1.03	0.18					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA19
Test Date: 05 June 2025

RECEIVED: 06/08/2026

	width (m)	length (m)
test pit top dimensions	1.70	2.50
test pit base dimensions	1.70	1.15
test pit depth (m)	1.90	

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.40	1.50
6	0.44	1.46
22	0.61	1.29
41	0.65	1.25
59	0.72	1.18
76	0.80	1.10
92	0.90	1.00
103	0.95	0.95
118	1.00	0.90
133	1.04	0.86
146	1.09	0.81
154	1.10	0.80
174	1.19	0.71

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 1.13 m

depth to water surface (target) 0.78 m

time to reach target depth 71.0 mins

Test end

25% head of water at 0.38 m

depth to water surface (target) 1.53 m

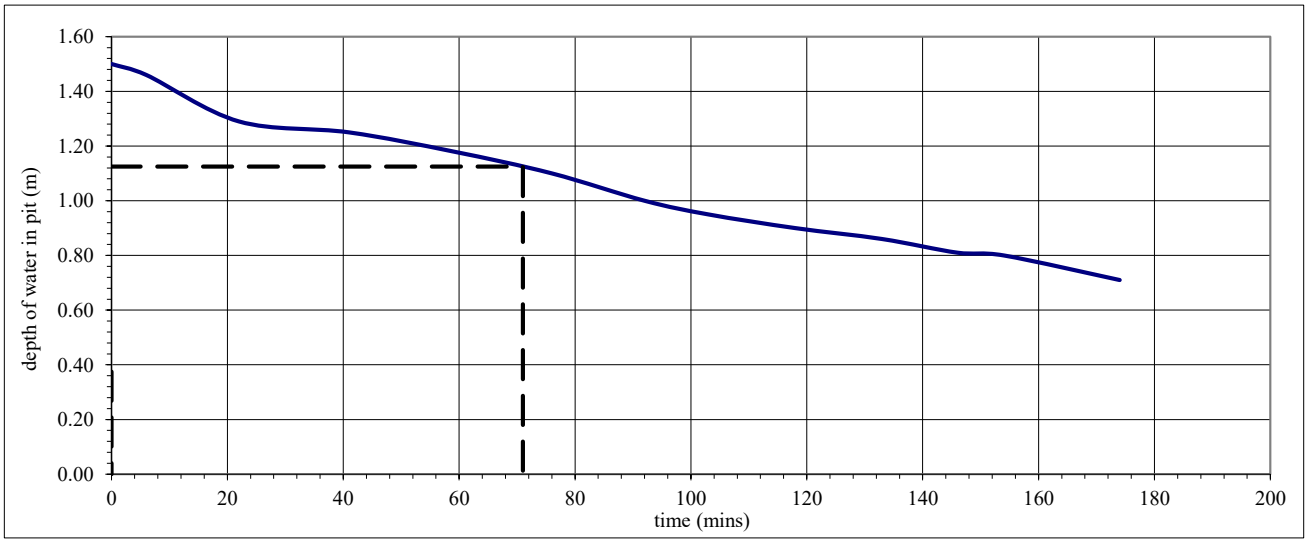
time to reach target depth not reached

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Infiltration rate (f) is very low

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
71	0.78	1.13	N/A				
	1.53	0.38					



Soakaway Infiltration Test

Project No.: 24-0211
Site: Kingston Lands, Galway
Test Location: SA20
Test Date: 06 June 2025

RECEIVED: 06/08/2026

Analysis using method as described in BRE DG 365 (2016) and CIRIA Report C753-The SUDS Manual (2015)

	width (m)	length (m)
test pit top dimensions	1.60	2.60
test pit base dimensions	1.55	1.30

test pit depth (m) 1.25

depth to groundwater before adding water (m) = Dry

Time (mins)	Depth to water surface (m)	Head of water in pit (m)
0	0.54	0.71
5	0.56	0.69
21	0.66	0.59
56	0.75	0.50
67	0.80	0.45
87	0.89	0.36
97	0.90	0.35
116	0.91	0.34
128	0.93	0.32
158	1.00	0.25
175	1.02	0.23
182	1.05	0.20
190	1.08	0.17

RESULTS (FROM GRAPH BELOW)

Test start

75% head of water at 0.53 m

depth to water surface (target) 0.72 m

time to reach target depth 41.0 mins

Test end

25% head of water at 0.18 m

depth to water surface (target) 1.07 m

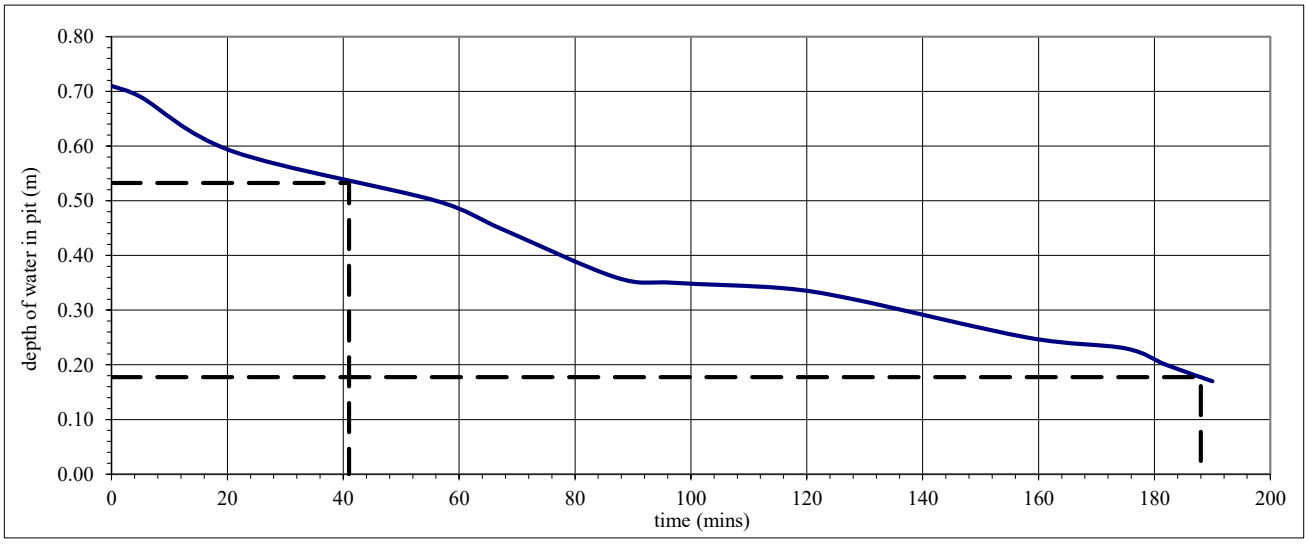
time to reach target depth 188.0 mins

soil infiltration rate $f = \frac{V_{p75\text{-}25}}{a_{s50} \times t_{p75\text{-}25}}$

Test infiltration rate (f) = 2.50E-05 m/s

TARGET DEPTHS AND CALCULATED VALUES

Time (mins)	Depth to water surface (m)	Head of water in pit (m)	Time elapsed, $t_{p75\text{-}25}$ (mins)	Volume of water lost, $V_{p75\text{-}25}$ (m^3)	Area of walls and base at 50% drop, a_{s50} (m^2)	Soil infiltration rate, (m/min)	Soil infiltration rate, f (m/h)
41	0.72	0.53	147	0.93	4.21	1.5E-03	0.090
188	1.07	0.18					



RECEIVED: 05/08/2026