# ORANMMORE LRD

# COAST ROAD, CARTRON

# ORANMORE, CO.GALWAY

## MARSHALL YARDS

## DEVELOPMENT COMPANY LTD.

## Infrastructure Report

**May 2024**

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**Client:** Marshall Yards Development Company Ltd.

**Project Title:** Oranmore LRD

**Address:** Lands North of Coast Road, Cartron, Oranmore, Co.Galway

**Report Title:** Infrastructure Report

**Job Number:** 23011

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**Author:** Cathal Kennedy

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| Revision | Issue Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
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# 1 INTRODUCTION

## 1.1 Background

AKM Consulting Engineers were commissioned by Marshall Yards Development Company Ltd. to prepare a civil infrastructure design for a Large-scale Residential Development (LRD) for lands north of Coast Road, Oranmmore, Co.Galway.

## 1.2 Existing Site

The existing site is a fully zoned green field site located north of the Coast Road in the townland of Cartron to the east of Oranmore. The site is bound on the north by an existing Iarnroid Eireann rail line and to the east and west by existing residential homes. The site is located 2.5km west from the centre of Oranmore and 7km east of Galway city centre. The Oranmore Train Station is located approximately 1km to the east. Opposite the site are two existing dwellings and the east part of the site faces directly onto Galway Bay.

The site is steeply graded from a high point in the north-west corner of 13.5m above datum to a low point at the south-east corner of 4.2m – an average grade of approximately 1:40. A copy of the topographical survey for the site is included as an appendix of this report.

The current use of the site is agricultural and there are no existing service connections on the site and access is currently provided through an existing farmhouse east of the site.

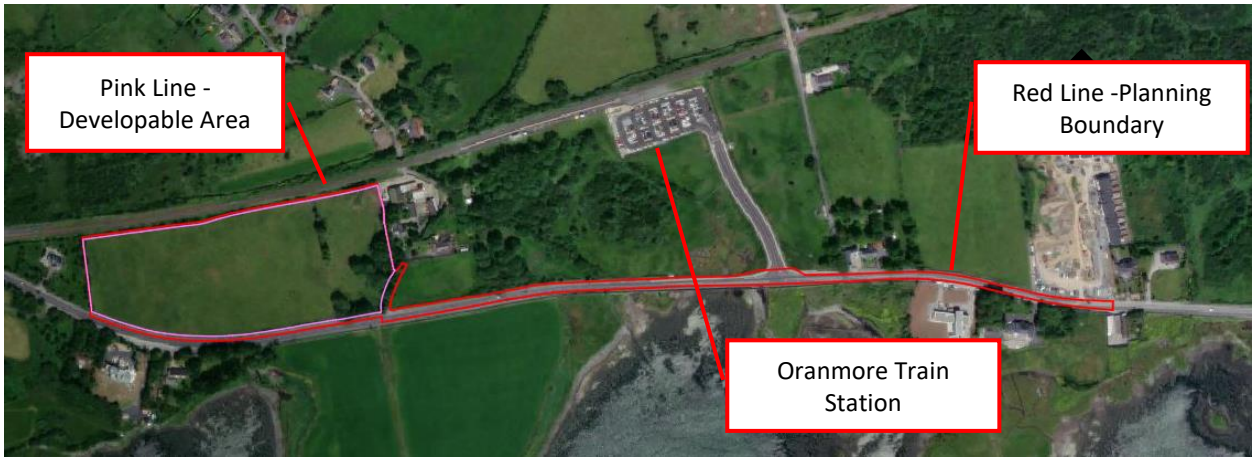


*Figure 1.1 Proposed site location*

## 1.3 Existing Ground Conditions

Two detailed site investigations were undertaken by a qualified geotechnical contractor to determine the ground conditions and soil type characteristics of the site. The ground investigation included trial pits, CBR's, boreholes, dynamic probing, and extensive soil infiltration testing. Soil testing was also undertaken to determine the soil type and soil classification and a Waste Classification Report was also produced. The strata encountered consisted mainly of the following:

- Topsoil (to maximum depth of 300mm)
- Made ground
- Cohesive deposits
- Granular clay deposits
- Bedrock

Results indicated that infiltration of runoff is generally possible throughout the site despite the presence of bedrock at varying depths. Geotechnical reports are included as an appendix to this report.

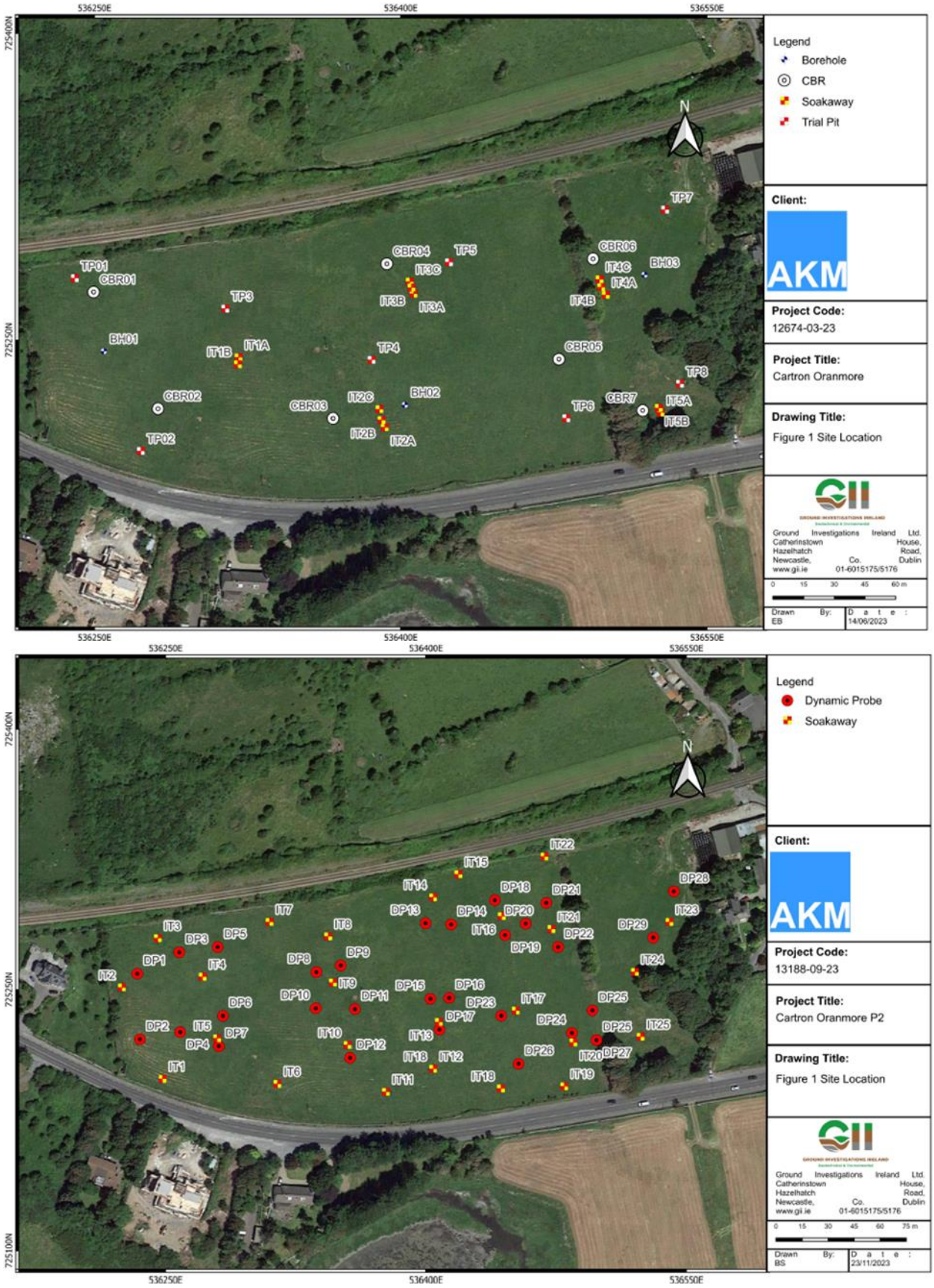


*Figure 1.2 Ground Testing Locations*

## 1.4 Proposed Development

Planning permission for the following Large Scale Residential Development (LRD) comprising the demolition of the existing shed and associated structures on site and the construction of 171 no. residential units, 1 no. creche and all associated development works including the provision of pedestrian/cyclist facilities along the R338 public road connecting to Oranmore rail station, 1 no. ESB substation, 1 no. pumping station, the undergrounding of the existing ESB sites traversing the site, footpaths, lighting, parking, drainage, bicycle and bin stores and landscaping/amenity areas at Cartron (townland), Oranmore, Co. Galway. Access will be via a new entrance on the L-71051 to the east.


*Figure 1.3 Proposed Site Layout Plan*

# 2 EXISTING PUBLIC SERVICES

## 2.1 General

A comprehensive topographical survey was carried out for the subject site. Existing drainage and utility records in the vicinity of the site were obtained from Uisce Eireann and preliminary discussion were had regarding services with Galway County Council.

A summary of the existing services is provided below, and the Uisce Eireann records can be found as an appendix to this report.

## 2.2 Foul Water Drainage

Uisce Eireann records for the surrounding area show no existing gravity sewers in the vicinity of the development site with only an existing rising main under the Coast Road. The nearest connection to the public network is a manhole on an existing gravity sewer approximately 860m to the east of the subject site.

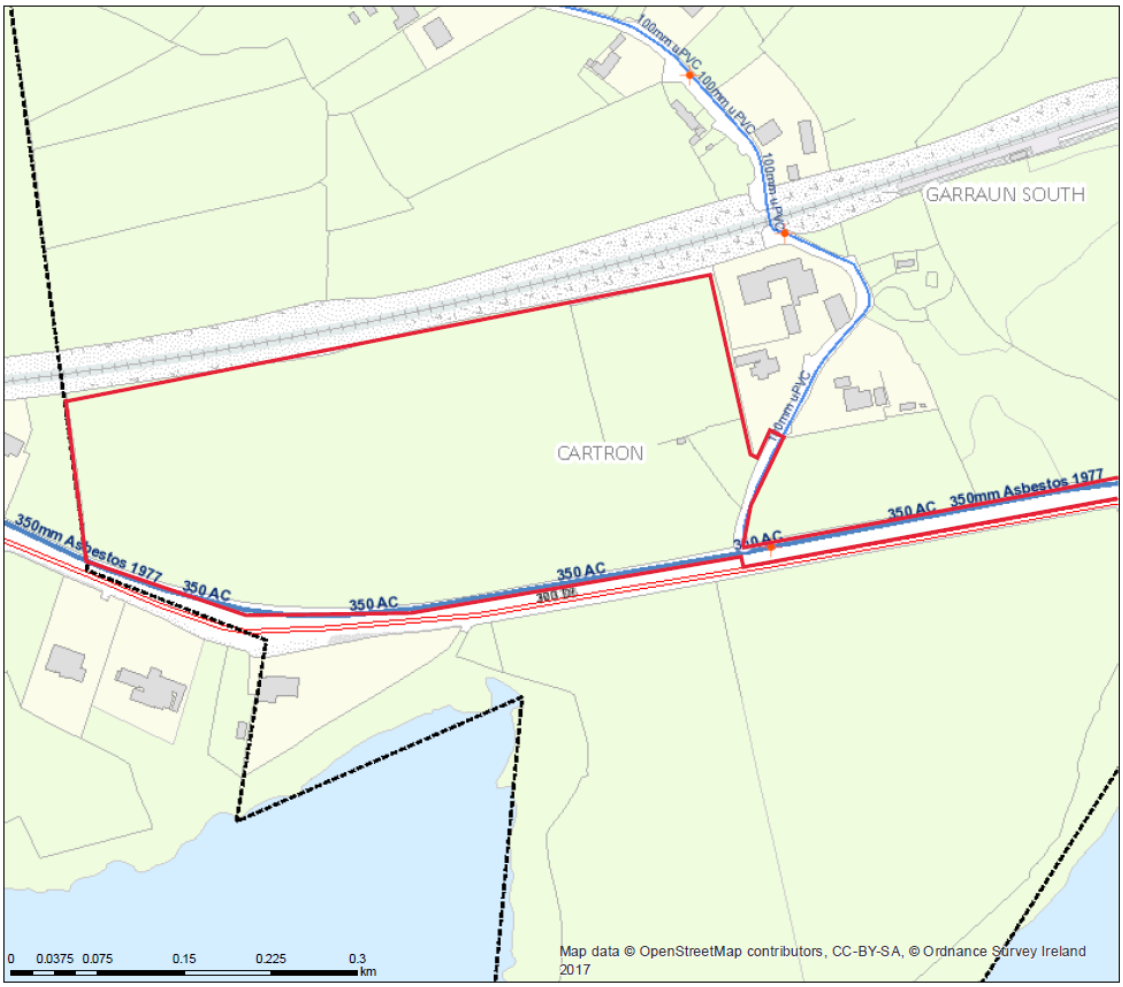


*Figure 2.1 Existing Services Map [Source: Uisce Eireann]*

**2.3 Surface Water Drainage**

Preliminary discussions were had with Galway County Council field staff at pre-planning stage who indicated that there is no existing drainage present on the Coast Road, runoff from which discharges directly to Galway Bay. This means that there can be no connection to discharge runoff from the site to the Coast Road due to environmental concerns regarding the bay ecology.

**2.4 Mains Water Supply**

Uisce Eireann records show a mains water supply running along the Coast Road directly in front of the subject site.

# 3 PROPOSED SURFACE WATER DRAINAGE & ATTENUATION

## 3.1 Surface Water Policy

The management of surface water for the proposed development has been designed to comply with the policies and guidelines outlined in the Greater Dublin Strategic Drainage Study (GDSDS), and Galway County Development Plan 2023-2029. The guidelines require the following 4 main criteria to be provided by the design:

- Criterion 1: River Water Quality Protection – satisfied by providing interception storage and treatment within the rain gardens, swales, tree pits, detention basins, permeable paving and garden areas.
- Criterion 2: River Regime Protection – satisfied by attenuating to greenfield run-off rates.
- Criterion 3: Level of Service (flooding) for the site – satisfied by the development's surface water drainage design, planned flood routing, run-off contained within site, flood storage and all buildings set greater than 0.5m above 100-year flood level & high-water level in the attenuation features.
- Criterion 4: River flood protection – attenuation volume and discharge limit designed to greenfield run-off rates (long term storage not provided).

## 3.2 Surface Water Strategy

To meet the requirements of the surface water policy above, the surface water strategy has been described in this section to give a clearer indication of how the design of the development has progressed to the submitted design.

Preliminary discussions were had with Mr. Peter Gavin (Galway County Council Area Engineer) who advised that there is no surface water sewer located along the Coast Road to the south and also advised that discharge of surface water to the sea is unlikely to be permitted and unlikely to pass the screening required. It is therefore proposed that all surface water runoff is dealt with through infiltration to ground within the site. This will be achieved through a combination of high-quality Sustainable Drainage System (SuDS) measures designed to attenuate and infiltrate stormwater runoff.

It is proposed that a tiered approach is applied to the management of runoff where initial runoff is intercepted through SuDS components such as soakaways and drainage swales and positive runoff from hardstanding areas in larger storm events is directed to the public network to be stored and infiltrated through a series of infiltration trenches in public open space areas.

A series of Hydrobrake flow control will be utilised within the site to minimise the flow of runoff from infiltration areas in order to maximise the use of infiltration and attenuation storage higher in the catchment of the site.

Runoff from roofs will be discharged into soakaways in the back gardens and in case of a storm exceed the design parameters (100 years + 30% for climate change) it will overflow to permeable paving under driveways to infiltrate. Runoff from public roads and footpaths will be dealt with through a combination of SuDS

measures including infiltrating swales, and a series of infiltration trenches to be constructed under public open spaces to allow runoff to be stored and to infiltrate to ground.

Two site investigations were done on-site in June and November 2023 which contained a combined total of 79 infiltration tests at various depths which were selected to represent the design levels of the infiltration trenches. From these tests, infiltration rates were established for the different areas of the site and used in a hydraulic model of the site to verify that there is adequate storage within the trenches and basin to prevent flooding within the site.

It is intended that the levels of the site will be raised by an average of 400mm to ensure protection from potential future sea level rise (discussed further in the Flood Risk Assessment Report) and to provide area for infiltration. Levels within the site will be designed to ensure that, in the event of failure of any part of the drainage network during an extreme weather event, overland flow paths will guide excess runoff towards open space areas to infiltrate and discharge via the Coast Road in the event of an overflow.

The public drainage network of this site was designed and proven using a detailed hydraulic model using the Causeway Flow hydraulic modelling software to verify it's safety the results of which are included as an appendix to this report.

### 3.3 Sustainable Urban Drainage Systems (SuDS)

In accordance with the GDSDS and the limitations on drainage within the site it is proposed to provide SuDS for managing surface water from the development. The aim of the SuDS strategy for the site will be to:

- Attenuate surface water runoff
- Reduce surface water runoff
- Reduce pollution impact
- Replicate the natural characteristics of rainfall runoff for the site

An assessment of the potential SuDS that could be incorporated within the site was conducted using the SuDS Manual, CIRIA 753 and the BRE 365 Digest for Soakaway Design. The following SuDS components are being incorporated into the drainage design for the site.

<u>Permeable Pavement (infiltration type system):</u>
Porous paving block surfacing which can treat rainwater, at source, and allow infiltration through to an underlying porous sub-base. Water is stored within the voids of the sub-base before being slowly released through natural flow via the porous medium. As well as reducing the amount of run-off from the surface, permeable paving will slow down the rate of run-off from the pavement in extreme rainfall events contributing to attenuation of flows. In addition, permeable paving will increase the quality of water which is intercepted by the system through filtration, biodegradation, pollutant absorption and settlement and retention of solids, also the peak flows to the outfall will enhance settlement and biodegradation of pollutants. It is proposed to use permeable paving on all the private car-parking areas as shown on the enclosed drawings.

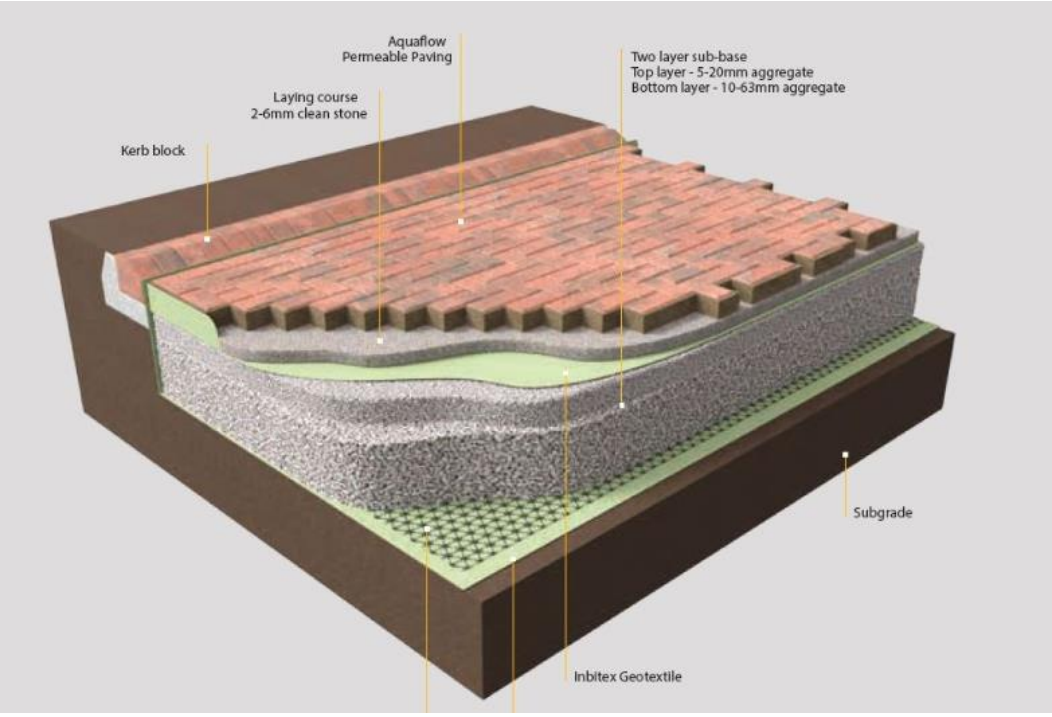


*Figure 3.1 Permeable paving to private driveway*

Soakaways:

Soakaways are an infiltrating SuDS component designed to provide void space under drives or gardens for temporary storage of runoff and to provide area for the water to infiltrate to ground. Soakaways can be made from concrete, brick or geocellular materials and can be hollow or filled with stone of high voids ratio. For this site it is proposed that stone-filled soakaways are used and designed as per the recommendations of the BRE 365 Digest on Soakaway design.

Soakaways have been provided for all where garden space was sufficient to allow. All the soakaways proposed for this development are sized to infiltrate all of the runoff from the roof area of the houses for a 100year storm with 30% climate change factor with a 100% runoff coefficient. Safety has been built into the design in a number of ways:

- It is proposed
- that each soakaway is provided with an overflow to the permeable paving under the driveway which will provide additional storage and infiltration. Under each driveway an additional overflow will be provided back to the public drainage network which will activate in the event of a failure of the infiltration or should a storm event significantly exceed the design parameters.
- Attached in Appendix A is a worked example of soakaway design as per BRE 365 Digest. This example was used to represent the largest roof area of all the units in the development and the infiltration rate was taken to be the average of a test failure and the lowest infiltration rate obtained within the site.
- As per the BRE 365 Digest infiltration is only assumed to occur through the sides of soakaways and not through the bottom and a factor of safety of 0.5

is applied to the infiltrating area. Infiltration test results are presented in the geotechnical reports included in Appendix E of this report.


*Figure 3.2 Garden Soakaway Example*

Swales:

Swales are shallow, flat bottomed, vegetated open channels designed to convey, treat and often attenuate surface water runoff. When incorporated into site design, they can enhance the natural landscape and provide aesthetic and biodiversity benefits. They are used to drain roads, paths or car parks where it is convenient to collect distributed inflows or runoff or as a means of conveying runoff on the surface while enhancing access corridors or other open space. Swales can replace conventional pipework as a means of conveying runoff, and the use of adjacent filter strips can also remove the need for kerbs or gullies. For this site swales are proposed for use in open space areas where sheet flow from roads discharges directly into the swale. Swales will incorporate check dams or weirs to slow the rate of discharge from the swale and filter drains to maximise infiltration.

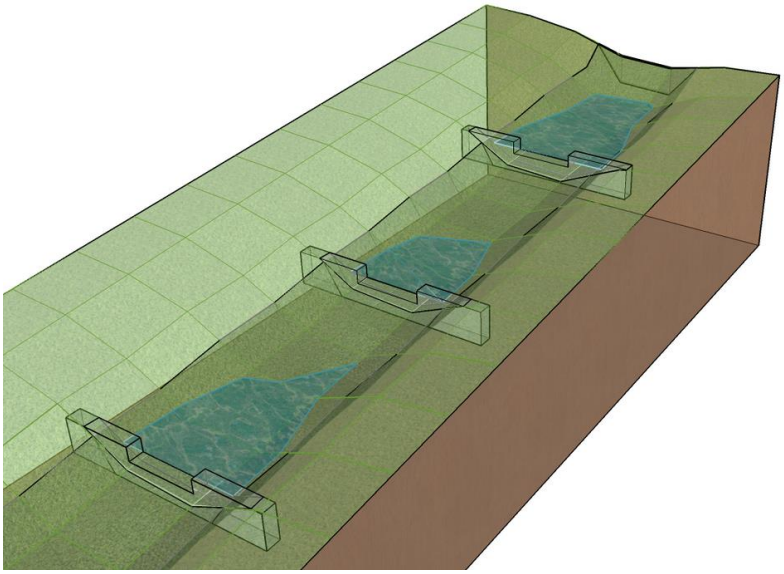

*Figure 3.3 Schematic drawing of a typical swale*

Infiltration Trenches:

Attenuation storage and infiltrating area is being provided in public areas through the implementation of an extensive network of infiltrating trenches. It is proposed that these trenches are built using the Stormbloc system which will provide the required attenuation volume and infiltrating area while still allowing access for maintenance and providing piped connections back to the public drainage system. Infiltration rates for each open space area were applied to each infiltration trench in the hydraulic modelling to ensure and accurate result. Consistent with the guidelines of the BRE 365 Digest, a safety factor of 2 was applied to the infiltrating area and no infiltration was assumed to take place through the base of the trench.

*Figure 3.4 Stormbloc Installation*

### 3.4 Attenuation

The stormwater attenuation required for this site was calculated using the Causeway Flow hydraulic modelling software which accounts for the fact that no water will be discharged from the site and that no QBAR allowable outflow is being used.

The impermeable areas contributing to the attenuation volume have had the following reduction factors applied:

- Impermeable roofs, roads, footpaths and shared surfaces; no reduction of the surface area is applied which is considered a conservative approach. It is likely that in reality a runoff coefficient of 0.9 is considered reasonable to take account of run-off not collected and stored within the micro and macro texture of the surfacing. (Various sources recommend different reduction coefficients e.g. IS EN752 recommends Runoff Coefficient (C for the Rational Method) of 0.9 to 1.0 for impermeable areas and steeply sloping roofs. For flat roofs it recommends 0.5 to 1.0 depending on area). Soakaways have been sized based upon a runoff coefficient of 1.0 for roof areas which is more conservative than the 0.9 which is generally used. However, garden sizes in certain areas would not allow for the construction of soakaways in all back gardens while maintaining the minimum 5m distance from foundations, as recommended by BRE Digest 365. In these cases, runoff from roofs will discharge to the public drainage system via perforated pipes under the permeable paving in driveways. Where this occurs a 75% runoff coefficient has been applied to roof area.

- Areas of permeable paving, a runoff coefficient of 0.5 has been applied.

- Green areas, a runoff coefficient of 0.1 has been applied due to the relatively steep slope of the site.

A summary of the surface water runoff reduction factors and associated areas for each catchment is shown in Table 3-1 below.

| Description | Area (m2) | Runoff Coefficient |
|---|---|---|
| Roofs | 9196 | 1.0 |
| Roads, footpaths & shared surfaces - Hardstanding | 10682 | 1.0 |
| Green areas | 9467 | 0.1 |
| Permeable paving areas | 5084 | 0.5 |

*Table 3.1 Surface Water runoff coefficients*

Storage of excess runoff while water infiltrates is provided through a combination of swales and hollow volume in the Stormbloc infiltration trenches for runoff from public areas. This volume is provided in private areas through the soakaways and under permeable paving in driveways. In total, 2439m3 of attenuation volume is provided across the site.

| Description | Storage Volume (m3) |
|---|---|
| Pipe and Pit Network | 168 |
| Swales | 82 |
| Soakaways & Permeable Paving | 1718 |
| Stormbloc Infiltration Trenches | 471 |
| **Total** | 2439 |

*Table 3.2 Attenuation Storage*

### 3.5 Design Standards

Storm-water drainage has been designed in accordance with the GDSDS Volume 2. The following design parameters are applicable to the design:

- Time of entry: 5 minutes
- Pipe friction (Ks): 0.6mm
- Minimum velocity: 1.0 m/s
- Standard Average Annual Rainfall (SAAR): 1274mm
- M5-60: 14.6mm
- Ratio r (M5-60/M5-2D): 0.245
- No flooding of storm network up to 100 year return period
- Infiltration Trenches Storm Return Event:
  FFL freeboard 500mm above 100 year flood level
  Climate Change: 30%

Surface water sewers have been designed in accordance with IS EN 752 and the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS).

Surface water sewers will consist of uPVC or concrete (to IS 123) and laid strictly in accordance with Galway County Council requirements for taking in charge. Manholes will generally take the form of precast concrete rings with precast perfect bases and constructed in accordance with Galway County Council guidelines & Uisce Eireann Standard Details.

Surface water private drains will generally be 100mm to 150mm diameter and generally will consist of uPVC (to IS123) with concrete surround or concrete socket and spigot pipes (to IS 6). These drains will be laid to comply with "Recommendations for Site Development Works for Housing Areas" by the Department of the Environment and Local Government, Technical Guidance Document, Section H and B.S. 8301: Building Drainage.

### 3.6 Climate Change

Surface water calculations for the development made use of rainfall values for the Oranmore area as provided by Met Eireann. Rainfall intensities were increased by a factor of 30% to take account of climate change, in accordance with the GDSDS.

### 3.7 Surface Water Quality Impact

Majority of the proposed development does not present a high risk of run-off contamination as most of the site coverage will be roof area for the housing, green area (open spaces and house yards) and pedestrian walkways. The parking areas will incorporate permeable paving that will provide treatment/filtration within the stone build-up beneath the permeable paving. The highest risk of contaminated

surface water run-off from the site would be from the roads. This risk is mitigated because all runoff will be infiltrated to ground, a process which provides treatment and filtration of silts, hydrocarbons and contaminants.

### 3.8 Interception

The GDSDS recommends that no run-off should pass directly to a river for rainfall depths of 5mm and up to 10mm if possible, i.e. interception. This development's unique, SuDS-focused design means that no runoff will be discharged from site for any rain event up to the 100yr storm event with a 30% climate change factor applied. In effect, this means that all runoff onto the site is intercepted and should have a net positive impact on the local drainage network post-development.

### 3.9 Flood Risk

The risk of flooding in the pre-development environment and potential impacts on the proposed development are addressed in the Site-Specific Flood Risk Assessment. This report determined that any highly vulnerable developments are at a very low risk of flooding for even the CFRAM Coastal Flood Extents – High-End Scenario mapped by the OPW.

# 4 PROPOSED FOUL WATER DRAINAGE

## 4.1 Proposed Foul Water Layout

A Pre-Connection Enquiry was submitted to Uisce Eireann early in the planning process which indicated that there is no existing gravity sewer in the vicinity of the site. Uisce Eireann indicated that foul service for the development would need to be provided via a new pump station and a rising main which will connect to an existing foul manhole located approx. 900m east of the subject site. Construction of the rising main and any offsite foul drainage works will be undertaken by Uisce Eireann directly.

The foul drainage network can be found on AKM drawings 23011-AKM-XXXX-XX-DR-C01-300001 & 23011-AKM-XXXX-XX-DR-C01-300002. This design has been reviewed and approved by Uisce Eireann.

A Confirmation of Feasibility & Statement of Design Acceptance have been received from Uisce Eireann and are attached in Appendix D of this report.

## 4.2 Design Calculations

All new main foul sewers are designed to discharge by gravity to the pump station. Minimum gradients and pipe diameters for gravity collector and main sewers are designed in accordance with the principles and methods set out in Uisce Eireann's Code of Practice & Standard Details for Wastewater Infrastructure, IS EN 752 (2008), IS EN12056: Part 2 and Building Regulations Part H.

Refer to Appendix G for design calculations of the foul sewer demand for the site and for the requirements of the foul pump station which will be designed as per the Uisce Eireann Code of Practice. Figure 4.1 below shows a schematic of a typical pump station layout showing inlet chamber, wet well & valve chamber with rising main.

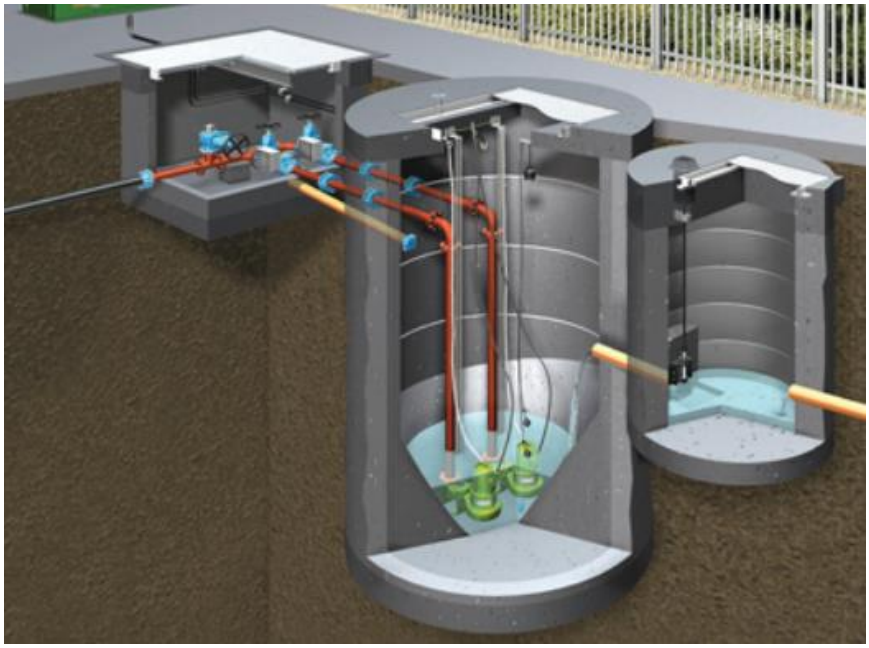

*Figure 4.1 Typical Pump Station*

# 5 PROPOSED WATER SUPPLY

## 5.1 Water Supply - General

A new connection will be made from the existing 350mm diameter asbestos watermain under the Coast Road south of the subject site. Refer to AKM drawings 23011-AKM-XXXX-XX-DR-C01-300003 for the watermain layout.

Uisce Eireann have issued a Confirmation of Feasibility for connection to the public water mains and a Statement of Design Acceptance for the proposed design - refer to Appendix D.

## 5.2 Watermain Design & Calculations

The following criteria will be applied:

- Watermains shall be laid in non-trafficked areas to maximum possible extent
- The location of valves, hydrants, air valves etc. in trafficked areas shall be avoided wherever practical.
- Watermains shall not pass under any structure
- A minimum cover of 0.9m shall be provided in trafficked areas with a desired cover of 1.2m
- Proper designed concrete thrust blocks shall be provided at all bends and tees located along the watermain where required.
- Marker tape, in blue PVC and incorporating a corrosion resistant tracing system and printed with the works 'WATERMAIN' throughout shall be laid directly over the centre line of the pipe, at least 300mm above the pipe. The tracer system shall be continuous and adequately secured to valves and fittings
- No common connections shall be provided. Each dwelling shall have its own individual connection.
- All boundary boxes/meter chambers shall be located in public access areas

The water demand is designed in accordance with the principles and methods set out in Uisce Eireann's Code of Practice for Water Infrastructure Connections and Developer Services Design & Construction Requirements for Self-Lay Developments July 2020.

Overall water demand is calculated using UE CoP for Water Infrastructure section 3.7.2.

Mains water demand calculations are attached as an appendix to this report.

## 5.3 Hydrants

Hydrants shall comply with the requirements of BS 750:2012 and shall be installed in accordance with Uisce Eireann's Code of Practice and Standard Details & TGD Part B. Refer to AKM drawing 23011-AKM-XXXX-XX-DR-C01-300003 for the watermain layout which also shows hydrant locations.

# 6 SITE ACCESS AND ROAD LAYOUT

## 6.1 Existing Access

The site is currently used for agricultural purposes and is access via gates from within the private property of the existing farmhouse to the east. There are 2no. gate accesses directly from Coast Road that are disused, and it is not intended to preserve these. See figure 6-1 below.


*Figure 6-1. Existing access into the site*

## 6.2 Proposed Vehicular Access

The proposed access for the site is via an existing access road on the east side of the site. This road currently acts as access to several residences to the east and north of the subject site. It is proposed that access to the site is via this existing entrance to the Coast Road as shown in figure 6-2 below.


*Figure 6-2. Proposed Vehicular access into the site*

As per the guidelines laid out in the Design Manual for Urban Roads & Streets (DMURS) standard roads in the development will be 5.5m wide with a 2m wide footpath. Internal radii on bends will generally be 3m. Homezones/shared spaces within the development will have a 4.8m wide trafficable area with a 1.2m wide pedestrian refuge area. Traffic calming will be provided via ramp entrances to each homezone a layout which manages speed by restricting the length of any straight roads. A separate DMURS compliance statement has been prepared by the project traffic consultant.

### 6.3 Proposed Pedestrian Access

Pedestrian access to the site is proposed via a new 2.0m wide footpaths which will be built into the proposed upgrade to the existing access junction on the Coast Road. It is proposed that pedestrian and cycle access to the nearby Oranmore train station is provided via a 3m wide shared path which will run along the front of the subject site and runs for 300m east of the site on the north side of the Coast Road to connect to an existing path at the train station entrance. The full 3m is not maintained for the full length of this part of the path due to space constraints between the Coast Road and third-party lands and existing stone walls.

### 6.4 Swept Path Analysis

The internal streets within the proposed development were designed to accommodate all types of anticipated vehicles which include cars, refuse vehicles and fire tender vehicles.

A swept path analysis has been carried out on the proposed road layout to demonstrate that the site's proposed corner radii and turning heads will accommodate everyday vehicles such as cars. Other vehicles such as refuse trucks and fire tender have been tracked to ensure they can turn and manoeuvre around the development. Internal roads and corner radii have been designed in accordance with recommendations laid down in DMURS. Refer to AKM drawing 23011-AKM-XXXX-XX-DR-C01-500002 & 23011-AKM-XXXX-XX-DR-C01-500003 for the proposed swept path layout.

### 6.5 Proposed Parking

Car parking has been provided as outlined below:

- 269 parking spaces in total throughout the whole development
- 7 no. spaces are for visitors
- 231 private, off-street 'in-curtilage' car parking spaces have been provided
- 24 on-street parking spaces for maisonettes and apartments
- 7 spaces have been provided for the creche

### 6.6 Cycle Parking

Extensive areas of Cycle parking is provided on site as outlined below:

- 880 bicycle parking spaces in total – this includes 86 no. short-stay visitor cycle spaces and 12 no. creche spaces.

**Signed:**

**Cathal Kennedy** BA, BAI, MSc, MIEI
**AKM Consulting Engineers**

# APPENDIX A – SURFACE WATER CALCULATIONS

# SOAKAWAY DESIGN
# AS PER BRE DIGEST 365

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**CATCHMENT**

| | |
|---|---|
| Area sq.m. | 65 |
| Area ha | 0.00065 |

**SOIL**

| | | |
|---|---|---|
| Infiltration rate | mm/sec | 0.00963 |
| Infiltration rate | m/s | 0.00000963 |
| Infiltration rate | m/hr | 0.034668 |

**SOAKAWAY**

| Length | Width | Depth | Void Rate | Storage | 50% Area | Outflow Factor |
|---|---|---|---|---|---|---|
| m. | m. | m. | % | cu.m. | sq.m. | cu.m/sec |
| 2.45 | 3 | 1.2 | 40% | 3.53 | 4.41 | 4.247E-05 |

**STORM**

| Climate Change | 30% |
|---|---|

| Storm dur | Area | Rainfall | Inflow | Outflow | Storage reqd | Storage | Time to empty 50% | Time to empty 50% | Time <= 24h |
|---|---|---|---|---|---|---|---|---|---|
| min | sq.m. | mm | cu.m. | cu.m. | cu.m. | >= reqd | min | hours | |
| 5 | 65 | 9.3 | 0.79 | 0.01 | 0.77 | Yes | 151.70 | 2.53 | Yes |
| 10 | 65 | 13 | 1.10 | 0.03 | 1.07 | Yes | 210.55 | 3.51 | Yes |
| 15 | 65 | 15.2 | 1.28 | 0.04 | 1.25 | Yes | 244.53 | 4.08 | Yes |
| 30 | 65 | 19.7 | 1.66 | 0.08 | 1.59 | Yes | 311.65 | 5.19 | Yes |
| 60 | 65 | 25.4 | 2.15 | 0.15 | 1.99 | Yes | 391.16 | 6.52 | Yes |
| 120 | 65 | 32.8 | 2.77 | 0.31 | 2.47 | Yes | 483.86 | 8.06 | Yes |
| 180 | 65 | 38 | 3.21 | 0.46 | 2.75 | Yes | 540.08 | 9.00 | Yes |
| 240 | 65 | 42.3 | 3.57 | 0.61 | 2.96 | Yes | 581.38 | 9.69 | Yes |
| 360 | 65 | 49.1 | 4.15 | 0.92 | 3.23 | Yes | 634.13 | 10.57 | Yes |
| 540 | 65 | 57 | 4.82 | 1.38 | 3.44 | Yes | 675.12 | 11.25 | Yes |
| **720** | **65** | **63.3** | **5.35** | **1.83** | **3.51** | **Yes** | **689.58** | **11.49** | **Yes** |
| 1440 | 65 | 81.7 | 6.90 | 3.67 | 3.23 | Yes | 634.67 | 10.58 | Yes |
| 2880 | 65 | 97.8 | 8.26 | 7.34 | 0.93 | Yes | 181.62 | 3.03 | Yes |
| 4320 | 65 | 111.4 | 9.41 | 11.01 | -1.59 | Yes | -312.88 | -5.21 | Yes |

| CAUSEWAY | AKM Consulting Ltd | File: 23011 - Flow Model.pfd<br>Network: STORM<br>Daniel de Oliveira<br>08/05/2024 | Page 1 |
|---|---|---|---|

## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 30 | Maximum Rainfall (mm/hr) | 50.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | Scotland and Ireland | Connection Type | Level Soffits |
| M5-60 (mm) | 14.600 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.245 | 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) |
|---|---|---|---|---|---|---|---|
| 1 | 0.075 | 5.00 | 13.594 | 1200 | 536240.781 | 725277.533 | 1.564 |
| 2 | 0.014 | 5.00 | 12.590 | 1200 | 536251.452 | 725221.521 | 1.740 |
| 3 | 0.019 | 5.00 | 12.549 | 1200 | 536230.224 | 725218.076 | 1.574 |
| 4 | | | 12.412 | 1200 | 536244.758 | 725216.688 | 1.537 |
| 5 | | 5.00 | 12.445 | | 536226.827 | 725215.398 | 0.545 |
| 6 | 0.018 | 5.00 | 12.274 | 5200 | 536246.541 | 725213.371 | 1.474 |
| 7 | | 5.00 | 11.944 | | 536223.821 | 725206.055 | 1.444 |
| 8 | | | 11.822 | 2500 | 536249.592 | 725204.621 | 1.372 |
| 9 | | 5.00 | 11.673 | | 536223.595 | 725201.354 | 1.323 |
| 10 | | | 11.600 | 2500 | 536251.678 | 725200.225 | 1.300 |
| 11 | 0.007 | 5.00 | 11.180 | | 536238.229 | 725194.981 | 1.136 |
| 12 | 0.012 | 5.00 | 11.495 | 2500 | 536261.912 | 725198.871 | 1.475 |
| 13 | | 5.00 | 10.907 | | 536251.481 | 725192.097 | 1.287 |
| 14 | | | 11.033 | 2500 | 536281.816 | 725197.008 | 1.433 |
| 15 | 0.029 | 5.00 | 12.795 | 1200 | 536332.069 | 725293.625 | 1.445 |
| 16 | 0.052 | 5.00 | 12.938 | 1200 | 536298.660 | 725287.321 | 1.811 |
| 17 | 0.029 | 5.00 | 11.436 | 1200 | 536307.178 | 725239.316 | 1.636 |
| 18 | 0.036 | 5.00 | 11.147 | 1200 | 536311.459 | 725216.054 | 1.790 |
| 19 | 0.012 | 5.00 | 10.505 | 1200 | 536314.066 | 725203.401 | 1.655 |
| 20 | | 5.00 | 11.809 | 1200 | 536258.667 | 725202.744 | 1.468 |
| 21 | 0.029 | 5.00 | 10.534 | 1200 | 536305.555 | 725198.207 | 1.734 |
| 22 | | 5.00 | 10.477 | | 536259.300 | 725188.017 | 1.677 |
| 23 | 0.033 | 5.00 | 10.349 | | 536306.313 | 725194.656 | 1.599 |
| 24 | | 5.00 | 10.244 | | 536268.778 | 725185.124 | 1.694 |
| 25 | | | 10.104 | 2500 | 536306.990 | 725190.664 | 1.604 |
| 26 | | 5.00 | 10.183 | | 536282.140 | 725182.050 | 1.783 |
| 27 | 0.012 | 5.00 | 9.798 | 2500 | 536307.838 | 725185.669 | 1.498 |
| 28 | | 5.00 | 9.776 | | 536296.023 | 725178.342 | 1.476 |
| 29 | | | 9.561 | 1800 | 536311.920 | 725183.002 | 1.311 |
| 30 | | 5.00 | 9.313 | | 536304.757 | 725175.833 | 1.263 |
| 31 | | | 9.327 | 1800 | 536316.022 | 725180.322 | 1.327 |
| 32 | | | 8.723 | 1200 | 536323.389 | 725175.672 | 1.177 |
| 33 | | | 7.525 | 1200 | 536368.223 | 725183.514 | 0.875 |
| 34 | | | 7.354 | 1200 | 536375.244 | 725184.461 | 0.854 |
| 35 | | | 7.189 | 1200 | 536383.099 | 725185.519 | 0.789 |
| 36 | 0.015 | 5.00 | 9.700 | | 536313.148 | 725185.858 | 0.550 |
| 37 | 0.027 | 5.00 | 9.058 | | 536321.369 | 725178.224 | 0.558 |
| 38 | 0.028 | 5.00 | 8.108 | | 536344.728 | 725179.986 | 0.608 |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| 39 | | 5.00 | 7.878 | 1200 | 536349.381 | 725182.481 | 1.578 |
| 40 | | | 7.234 | 1200 | 536384.813 | 725189.248 | 1.234 |
| 41 | | | 7.270 | 5200 | 536385.562 | 725187.135 | 1.320 |
| 42 | 0.063 | 5.00 | 9.588 | 1200 | 536382.945 | 725237.812 | 2.288 |
| 43 | | | 7.354 | 1200 | 536390.451 | 725196.121 | 1.451 |
| 44 | 0.006 | 5.00 | 6.991 | | 536369.594 | 725175.103 | 1.591 |
| 45 | 0.040 | 5.00 | 7.212 | 2500 | 536389.076 | 725186.324 | 1.912 |
| 46 | | | 6.879 | 1500 | 536389.634 | 725182.672 | 1.079 |
| 47 | | 5.00 | 6.533 | | 536379.953 | 725175.225 | 1.283 |
| 48 | | | 6.756 | 1800 | 536400.564 | 725183.000 | 1.556 |
| 49 | | 5.00 | 6.078 | | 536391.775 | 725175.549 | 1.328 |
| 50 | | | 6.236 | 1800 | 536401.995 | 725180.052 | 1.536 |
| 51 | | | 5.587 | 2500 | 536401.690 | 725175.655 | 1.287 |
| 52 | | 5.00 | 6.929 | | 536402.768 | 725184.960 | 0.629 |
| 53 | | | 5.890 | 5200 | 536441.161 | 725192.140 | 0.940 |
| 55 | 0.033 | 5.00 | 12.776 | 1200 | 536336.952 | 725294.298 | 1.476 |
| 56 | 0.041 | 5.00 | 11.839 | 1200 | 536371.345 | 725300.597 | 1.439 |
| 57 | 0.006 | 5.00 | 10.330 | 1200 | 536377.005 | 725269.187 | 1.230 |
| 58 | | | 10.227 | 1200 | 536385.780 | 725267.001 | 1.227 |
| 59 | | 5.00 | 10.005 | | 536399.536 | 725272.865 | 1.555 |
| 60 | | | 10.055 | 1800 | 536386.779 | 725263.053 | 1.655 |
| 61 | | | 9.759 | 1200 | 536388.147 | 725256.689 | 0.959 |
| 62 | | 5.00 | 9.261 | | 536417.891 | 725276.691 | 1.111 |
| 63 | | | 9.484 | 1800 | 536390.005 | 725247.920 | 1.384 |
| 64 | | | 9.296 | 1200 | 536395.750 | 725248.657 | 1.146 |
| 65 | 0.058 | 5.00 | 9.590 | 1200 | 536428.146 | 725311.395 | 1.590 |
| 66 | 0.010 | 5.00 | 8.457 | 1200 | 536434.211 | 725278.249 | 1.157 |
| 67 | | | 8.521 | 1800 | 536431.032 | 725276.683 | 1.271 |
| 68 | 0.013 | 5.00 | 8.948 | 1800 | 536405.595 | 725249.430 | 1.748 |
| 69 | | 5.00 | 8.063 | | 536432.912 | 725265.332 | 1.363 |
| 70 | | | 8.322 | 2500 | 536425.471 | 725253.245 | 1.722 |
| 71 | 0.069 | 5.00 | 11.407 | 1200 | 536316.759 | 725236.396 | 2.623 |
| 72 | 0.020 | 5.00 | 10.173 | 1200 | 536377.792 | 725265.692 | 1.773 |
| 73 | 0.016 | 5.00 | 9.743 | 1200 | 536380.783 | 725248.405 | 1.475 |
| 74 | 0.013 | 5.00 | 9.341 | 1350 | 536389.681 | 725240.724 | 1.746 |
| 75 | 0.035 | 5.00 | 8.233 | 1200 | 536426.963 | 725247.588 | 1.433 |
| 76 | 0.007 | 5.00 | 8.268 | 1350 | 536435.140 | 725274.423 | 1.768 |
| 77 | 0.022 | 5.00 | 7.569 | 1350 | 536439.221 | 725249.719 | 1.769 |
| 78 | 0.035 | 5.00 | 7.041 | 1200 | 536404.031 | 725187.191 | 1.441 |
| 79 | 0.013 | 5.00 | 5.932 | 1200 | 536443.070 | 725194.504 | 1.382 |
| 80 | 0.053 | 5.00 | 5.797 | 1200 | 536448.720 | 725198.255 | 1.197 |
| 81 | | | 5.444 | 2500 | 536444.370 | 725188.566 | 1.194 |
| 82 | 0.008 | 5.00 | 4.993 | | 536417.498 | 725176.974 | 1.293 |
| 83 | | | 5.375 | 2500 | 536456.010 | 725189.508 | 1.695 |
| 84 | 0.030 | 5.00 | 5.585 | | 536456.444 | 725192.565 | 1.185 |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| 85 | 0.012 | 5.00 | 5.423 | 1200 | 536495.594 | 725200.000 | 1.273 |
| 86 | | | 5.358 | 1200 | 536487.321 | 725198.433 | 1.258 |
| 87 | | | 5.253 | 1800 | 536487.779 | 725195.674 | 1.603 |
| 88 | | 5.00 | 4.967 | | 536456.861 | 725186.394 | 1.267 |
| 89 | | | 5.037 | | 536488.262 | 725193.306 | 1.407 |
| 90 | | 5.00 | 4.809 | | 536436.321 | 725180.431 | 1.159 |
| 91 | | | 4.787 | | 536488.961 | 725190.493 | 1.187 |
| 91_OUT | | | 4.997 | 1200 | 536491.562 | 725191.051 | 1.097 |
| 93 | 0.107 | 5.00 | 7.974 | 1200 | 536483.101 | 725322.110 | 1.574 |
| 94 | 0.076 | 5.00 | 7.260 | 1200 | 536454.976 | 725250.360 | 1.902 |
| 95 | 0.020 | 5.00 | 6.568 | 1200 | 536494.944 | 725257.605 | 1.465 |
| 96 | 0.008 | 5.00 | 5.596 | 1200 | 536537.820 | 725265.377 | 1.496 |
| 97 | 0.025 | 5.00 | 6.754 | 1200 | 536534.101 | 725335.043 | 1.425 |
| 98 | 0.001 | 5.00 | 6.485 | 1200 | 536542.714 | 725335.990 | 1.683 |
| 99 | | | 5.480 | 1200 | 536552.631 | 725269.672 | 1.480 |
| 100 | 0.060 | 5.00 | 6.473 | | 536546.680 | 725336.287 | 0.573 |
| 101 | | | 6.006 | | 536552.697 | 725304.124 | 0.506 |
| 102 | | | 5.949 | | 536552.984 | 725296.634 | 0.549 |
| 103 | | | 5.398 | | 536557.319 | 725270.610 | 0.948 |
| 104 | 0.006 | 5.00 | 5.153 | | 536560.127 | 725282.008 | 1.603 |
| 105 | | | 4.767 | 2500 | 536562.692 | 725268.058 | 1.267 |
| 106 | | | 5.551 | 2500 | 536555.892 | 725267.078 | 2.101 |
| 107 | | | 5.589 | 2500 | 536546.212 | 725259.788 | 2.189 |
| 108 | | 5.00 | 5.438 | 1200 | 536540.788 | 725251.082 | 1.425 |
| 109 | 0.106 | 5.00 | 5.356 | 1200 | 536542.497 | 725240.740 | 1.456 |
| 110 | | | 5.506 | 2500 | 536549.570 | 725240.595 | 2.156 |
| 111 | | | 5.240 | | 536551.521 | 725229.487 | 1.940 |
| 112 | 0.001 | 5.00 | 5.366 | | 536565.770 | 725243.611 | 2.066 |
| 113 | | | 5.512 | | 536559.673 | 725242.456 | 2.212 |
| 114 | | | 5.542 | | 536553.448 | 725241.276 | 2.242 |
| 115 | | | 5.157 | | 536555.399 | 725230.168 | 1.857 |
| 117 | | | 5.017 | | 536560.126 | 725230.632 | 1.717 |
| 119 | | | 5.114 | 1800 | 536557.801 | 725230.459 | 1.814 |
| 120 | | 5.00 | 4.999 | | 536525.326 | 725210.777 | 2.399 |
| 121 | 0.066 | 5.00 | 5.274 | 1200 | 536545.615 | 725228.548 | 1.474 |
| 122 | | 5.00 | 4.780 | 1200 | 536561.398 | 725223.407 | 1.430 |
| 123 | | | 4.323 | | 536553.682 | 725216.363 | 1.773 |
| 124 | 0.017 | 5.00 | 4.321 | | 536541.536 | 725210.847 | 1.771 |
| 125 | | | 4.639 | 1800 | 536552.969 | 725212.890 | 2.139 |
| 126 | | 5.00 | 4.200 | | 536542.168 | 725206.954 | 1.650 |
| 127 | | | 4.581 | | 536552.662 | 725208.854 | 2.081 |
| 128 | | 5.00 | 4.000 | | 536542.676 | 725203.831 | 1.500 |
| 129 | | | 4.450 | 1800 | 536552.628 | 725205.587 | 2.000 |
| 130 | | 5.00 | 4.520 | | 536534.802 | 725198.224 | 2.070 |
| 131 | | | 4.394 | 1800 | 536551.712 | 725201.688 | 1.994 |
| 131_OUT | | | 4.000 | 1200 | 536554.935 | 725198.471 | 1.150 |
| 92 | 0.003 | 5.00 | 8.071 | 1200 | 536474.579 | 725320.795 | 1.471 |

## 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 | 1 | 2 | 57.019 | 0.600 | 12.030 | 10.850 | 1.180 | 48.3 | 225 | 5.50 | 50.0 |
| 1.001 | 2 | 6 | 9.515 | 0.600 | 10.850 | 10.800 | 0.050 | 190.3 | 225 | 5.67 | 50.0 |
| 3.000 | 3 | 4 | 14.600 | 0.600 | 10.975 | 10.875 | 0.100 | 146.0 | 225 | 5.23 | 50.0 |
| 3.001 | 4 | 6 | 3.766 | 0.600 | 10.875 | 10.800 | 0.075 | 50.2 | 225 | 5.26 | 50.0 |
| 2.000 | 5 | 6 | 19.818 | 0.600 | 11.900 | 11.750 | 0.150 | 132.1 | 500 | 5.11 | 50.0 |
| 1.002 | 6 | 8 | 9.267 | 0.600 | 10.800 | 10.750 | 0.050 | 185.3 | 225 | 5.83 | 50.0 |
| 4.000 | 7 | 8 | 25.811 | 0.600 | 10.500 | 10.450 | 0.050 | 516.2 | 660 | 5.29 | 50.0 |
| 1.003 | 8 | 10 | 4.866 | 0.600 | 11.000 | 10.900 | 0.100 | 48.7 | 225 | 5.88 | 50.0 |
| 5.000 | 9 | 10 | 28.106 | 0.600 | 10.350 | 10.300 | 0.050 | 562.1 | 660 | 5.33 | 50.0 |
| 1.004 | 10 | 12 | 10.323 | 0.600 | 10.900 | 10.650 | 0.250 | 41.3 | 225 | 5.96 | 50.0 |
| 6.000 | 11 | 12 | 24.000 | 0.600 | 10.044 | 10.020 | 0.024 | 1000.0 | 660 | 5.38 | 50.0 |
| 1.005 | 12 | 14 | 19.991 | 0.600 | 10.650 | 10.200 | 0.450 | 44.4 | 225 | 6.13 | 50.0 |
| 7.000 | 13 | 14 | 30.730 | 0.600 | 9.620 | 9.600 | 0.020 | 1536.5 | 660 | 5.61 | 50.0 |
| 1.006 | 14 | 23 | 24.610 | 0.600 | 10.200 | 9.300 | 0.900 | 27.3 | 225 | 6.29 | 50.0 |
| 8.000 | 15 | 16 | 33.999 | 0.600 | 11.350 | 11.127 | 0.223 | 152.5 | 225 | 5.54 | 50.0 |
| 8.001 | 16 | 17 | 48.755 | 0.600 | 11.127 | 9.800 | 1.327 | 36.7 | 225 | 5.91 | 50.0 |
| 8.002 | 17 | 18 | 23.653 | 0.600 | 9.800 | 9.600 | 0.200 | 118.3 | 225 | 6.24 | 50.0 |
| 8.003 | 18 | 19 | 12.919 | 0.600 | 9.357 | 8.850 | 0.507 | 25.5 | 225 | 6.32 | 50.0 |
| 8.004 | 19 | 21 | 9.971 | 0.600 | 8.850 | 8.800 | 0.050 | 199.4 | 225 | 6.50 | 50.0 |
| 9.000 | 20 | 21 | 47.107 | 0.600 | 10.341 | 8.865 | 1.476 | 31.9 | 225 | 5.34 | 50.0 |
| 8.005 | 21 | 23 | 3.631 | 0.600 | 8.800 | 8.750 | 0.050 | 72.6 | 225 | 6.54 | 50.0 |
| 10.000 | 22 | 23 | 47.479 | 0.600 | 8.800 | 8.750 | 0.050 | 949.6 | 660 | 5.74 | 50.0 |
| 1.007 | 23 | 25 | 4.049 | 0.600 | 9.300 | 9.100 | 0.200 | 20.2 | 225 | 6.57 | 50.0 |
| 11.000 | 24 | 25 | 38.612 | 0.600 | 8.550 | 8.500 | 0.050 | 772.2 | 660 | 5.54 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 1.886 | 75.0 | 10.1 | 1.339 | 1.515 | 0.075 | 0.0 | 56 | 1.328 |
| 1.001 | 0.944 | 37.5 | 12.0 | 1.515 | 1.249 | 0.089 | 0.0 | 87 | 0.842 |
| 3.000 | 1.080 | 42.9 | 2.6 | 1.349 | 1.312 | 0.019 | 0.0 | 37 | 0.599 |
| 3.001 | 1.850 | 73.6 | 2.6 | 1.312 | 1.249 | 0.019 | 0.0 | 29 | 0.872 |
| 2.000 | 2.979 | 3425.3 | 0.0 | 0.045 | 0.024 | 0.000 | 0.0 | 0 | 0.000 |
| 1.002 | 0.957 | 38.0 | 17.0 | 1.249 | 0.847 | 0.126 | 0.0 | 106 | 0.933 |
| 4.000 | 1.461 | 1542.9 | 0.0 | 0.784 | 0.712 | 0.000 | 0.0 | 0 | 0.000 |
| 1.003 | 1.879 | 74.7 | 17.0 | 0.597 | 0.475 | 0.126 | 0.0 | 73 | 1.527 |
| 5.000 | 1.400 | 1478.0 | 0.0 | 0.663 | 0.640 | 0.000 | 0.0 | 0 | 0.000 |
| 1.004 | 2.041 | 81.2 | 17.0 | 0.475 | 0.620 | 0.126 | 0.0 | 70 | 1.626 |
| 6.000 | 1.046 | 1104.9 | 1.0 | 0.476 | 0.815 | 0.007 | 0.0 | 7 | 0.091 |
| 1.005 | 1.968 | 78.2 | 19.6 | 0.620 | 0.608 | 0.145 | 0.0 | 77 | 1.648 |
| 7.000 | 0.842 | 888.9 | 0.0 | 0.627 | 0.773 | 0.000 | 0.0 | 0 | 0.000 |
| 1.006 | 2.511 | 99.9 | 19.6 | 0.608 | 0.824 | 0.145 | 0.0 | 67 | 1.961 |
| 8.000 | 1.056 | 42.0 | 3.9 | 1.220 | 1.586 | 0.029 | 0.0 | 46 | 0.665 |
| 8.001 | 2.165 | 86.1 | 11.0 | 1.586 | 1.411 | 0.081 | 0.0 | 54 | 1.498 |
| 8.002 | 1.201 | 47.8 | 14.9 | 1.411 | 1.322 | 0.110 | 0.0 | 87 | 1.067 |
| 8.003 | 2.602 | 103.5 | 19.8 | 1.565 | 1.430 | 0.146 | 0.0 | 66 | 2.017 |
| 8.004 | 0.922 | 36.7 | 21.4 | 1.430 | 1.509 | 0.158 | 0.0 | 123 | 0.956 |
| 9.000 | 2.324 | 92.4 | 0.0 | 1.243 | 1.444 | 0.000 | 0.0 | 0 | 0.000 |
| 8.005 | 1.536 | 61.1 | 25.3 | 1.509 | 1.374 | 0.187 | 0.0 | 101 | 1.464 |
| 10.000 | 1.074 | 1134.2 | 0.0 | 1.017 | 0.939 | 0.000 | 0.0 | 0 | 0.000 |
| 1.007 | 2.921 | 116.1 | 49.4 | 0.824 | 0.779 | 0.365 | 0.0 | 102 | 2.806 |
| 11.000 | 1.192 | 1259.1 | 0.0 | 1.034 | 0.944 | 0.000 | 0.0 | 0 | 0.000 |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.008 | 25 | 27 | 5.066 | 0.600 | 9.100 | 8.900 | 0.200 | 25.3 | 225 | 6.60 | 50.0 |
| 12.000 | 26 | 27 | 25.952 | 0.600 | 8.400 | 8.300 | 0.100 | 259.5 | 660 | 5.21 | 50.0 |
| 1.009 | 27 | 29 | 4.876 | 0.600 | 8.900 | 8.700 | 0.200 | 24.4 | 225 | 6.63 | 50.0 |
| 13.000 | 28 | 29 | 16.566 | 0.600 | 8.300 | 8.250 | 0.050 | 331.3 | 660 | 5.15 | 50.0 |
| 1.010 | 29 | 31 | 4.900 | 0.600 | 8.700 | 8.500 | 0.200 | 24.5 | 225 | 6.66 | 50.0 |
| 14.000 | 30 | 31 | 12.126 | 0.600 | 8.050 | 8.000 | 0.050 | 242.5 | 660 | 5.09 | 50.0 |
| 1.011 | 31 | 32 | 8.712 | 0.600 | 8.500 | 8.000 | 0.500 | 17.4 | 225 | 6.71 | 50.0 |
| 1.012 | 32 | 33 | 45.515 | 0.600 | 7.546 | 6.650 | 0.896 | 50.8 | 225 | 7.12 | 50.0 |
| 1.013 | 33 | 34 | 7.085 | 0.600 | 6.650 | 6.500 | 0.150 | 47.2 | 225 | 7.18 | 50.0 |
| 1.014 | 34 | 35 | 7.926 | 0.600 | 6.500 | 6.400 | 0.100 | 79.3 | 225 | 7.27 | 50.0 |
| 1.015 | 35 | 45 | 6.031 | 0.600 | 6.400 | 6.250 | 0.150 | 40.2 | 225 | 7.32 | 50.0 |
| 15.000 | 36 | 37 | 11.219 | 0.600 | 9.150 | 8.500 | 0.650 | 17.3 | 500 | 5.02 | 50.0 |
| 15.001 | 37 | 38 | 23.425 | 0.600 | 8.500 | 7.500 | 1.000 | 23.4 | 500 | 5.08 | 50.0 |
| 15.002 | 38 | 41 | 41.455 | 0.600 | 7.500 | 6.750 | 0.750 | 55.3 | 500 | 5.23 | 50.0 |
| 16.000 | 39 | 40 | 36.072 | 0.600 | 6.300 | 6.000 | 0.300 | 120.2 | 225 | 5.50 | 50.0 |
| 16.001 | 40 | 41 | 2.242 | 0.600 | 6.000 | 5.950 | 0.050 | 44.8 | 225 | 5.52 | 50.0 |
| 15.003 | 41 | 45 | 3.606 | 0.600 | 5.950 | 5.900 | 0.050 | 72.1 | 225 | 5.56 | 50.0 |
| 17.000 | 42 | 43 | 42.361 | 0.600 | 7.300 | 5.903 | 1.397 | 30.3 | 225 | 5.30 | 50.0 |
| 17.001 | 43 | 45 | 9.893 | 0.600 | 5.903 | 5.800 | 0.103 | 96.0 | 225 | 5.42 | 50.0 |
| 18.000 | 44 | 45 | 22.482 | 0.600 | 5.400 | 5.300 | 0.100 | 224.8 | 660 | 5.17 | 50.0 |
| 1.016 | 45 | 46 | 3.694 | 0.600 | 5.850 | 5.800 | 0.050 | 73.9 | 300 | 5.34 | 50.0 |
| 1.017 | 46 | 48 | 10.935 | 0.600 | 5.800 | 5.700 | 0.100 | 109.3 | 300 | 5.46 | 50.0 |
| 19.000 | 47 | 48 | 22.029 | 0.600 | 5.250 | 5.200 | 0.050 | 440.6 | 660 | 5.23 | 50.0 |
| 1.018 | 48 | 50 | 3.277 | 0.600 | 5.700 | 5.300 | 0.400 | 8.2 | 300 | 5.47 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 1.008 | 2.610 | 103.8 | 49.4 | 0.779 | 0.673 | 0.365 | 0.0 | 109 | 2.580 |
| 12.000 | 2.066 | 2181.6 | 0.0 | 1.123 | 0.838 | 0.000 | 0.0 | 0 | 0.000 |
| 1.009 | 2.660 | 105.8 | 51.0 | 0.673 | 0.636 | 0.376 | 0.0 | 110 | 2.639 |
| 13.000 | 1.827 | 964.6 | 0.0 | 0.816 | 0.651 | 0.000 | 0.0 | 0 | 0.000 |
| 1.010 | 2.654 | 105.5 | 51.0 | 0.636 | 0.602 | 0.376 | 0.0 | 110 | 2.632 |
| 14.000 | 2.137 | 1128.6 | 0.0 | 0.603 | 0.667 | 0.000 | 0.0 | 0 | 0.000 |
| 1.011 | 3.149 | 125.2 | 51.0 | 0.602 | 0.498 | 0.376 | 0.0 | 100 | 2.991 |
| 1.012 | 1.839 | 73.1 | 51.0 | 0.952 | 0.650 | 0.376 | 0.0 | 138 | 1.983 |
| 1.013 | 1.908 | 75.9 | 51.0 | 0.650 | 0.629 | 0.376 | 0.0 | 135 | 2.040 |
| 1.014 | 1.470 | 58.4 | 51.0 | 0.629 | 0.564 | 0.376 | 0.0 | 163 | 1.650 |
| 1.015 | 2.069 | 82.3 | 51.0 | 0.564 | 0.737 | 0.376 | 0.0 | 129 | 2.178 |
| 15.000 | 8.264 | 9503.6 | 2.0 | 0.050 | 0.058 | 0.015 | 0.0 | 7 | 0.761 |
| 15.001 | 7.092 | 8155.5 | 5.6 | 0.058 | 0.108 | 0.041 | 0.0 | 15 | 1.024 |
| 15.002 | 4.612 | 5303.9 | 9.4 | 0.108 | 0.020 | 0.069 | 0.0 | 26 | 0.905 |
| 16.000 | 1.191 | 47.4 | 0.0 | 1.353 | 1.009 | 0.000 | 0.0 | 0 | 0.000 |
| 16.001 | 1.958 | 77.9 | 0.0 | 1.009 | 1.095 | 0.000 | 0.0 | 0 | 0.000 |
| 15.003 | 1.541 | 61.3 | 9.4 | 1.095 | 1.087 | 0.069 | 0.0 | 59 | 1.123 |
| 17.000 | 2.384 | 94.8 | 8.5 | 2.063 | 1.226 | 0.063 | 0.0 | 45 | 1.489 |
| 17.001 | 1.334 | 53.0 | 8.5 | 1.226 | 1.187 | 0.063 | 0.0 | 61 | 0.987 |
| 18.000 | 2.221 | 2344.9 | 0.8 | 0.931 | 1.252 | 0.006 | 0.0 | 4 | 0.125 |
| 1.016 | 1.831 | 129.4 | 75.1 | 1.062 | 0.779 | 0.554 | 0.0 | 164 | 1.897 |
| 1.017 | 1.503 | 106.2 | 75.1 | 0.779 | 0.756 | 0.554 | 0.0 | 187 | 1.625 |
| 19.000 | 1.583 | 835.6 | 0.0 | 0.623 | 0.896 | 0.000 | 0.0 | 0 | 0.000 |
| 1.018 | 5.524 | 390.5 | 75.1 | 0.756 | 0.636 | 0.554 | 0.0 | 89 | 4.303 |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.000 | 49 | 50 | 11.168 | 0.600 | 4.750 | 4.700 | 0.050 | 223.4 | 660 | 5.08 | 50.0 |
| 1.019 | 50 | 51 | 4.408 | 0.600 | 5.300 | 4.800 | 0.500 | 8.8 | 300 | 5.48 | 50.0 |
| 1.020 | 51 | 81 | 44.590 | 0.600 | 4.300 | 4.250 | 0.050 | 891.8 | 660 | 6.16 | 50.0 |
| 21.000 | 55 | 56 | 34.965 | 0.600 | 11.300 | 10.400 | 0.900 | 38.9 | 225 | 5.28 | 50.0 |
| 21.001 | 56 | 57 | 31.916 | 0.600 | 10.400 | 9.100 | 1.300 | 24.6 | 225 | 5.48 | 50.0 |
| 21.002 | 57 | 58 | 9.043 | 0.600 | 9.100 | 9.000 | 0.100 | 90.4 | 225 | 5.59 | 50.0 |
| 21.003 | 58 | 60 | 4.072 | 0.600 | 9.000 | 8.950 | 0.050 | 81.4 | 225 | 5.63 | 50.0 |
| 22.000 | 59 | 60 | 16.094 | 0.600 | 8.450 | 8.400 | 0.050 | 321.9 | 660 | 5.14 | 50.0 |
| 21.004 | 60 | 61 | 6.509 | 0.600 | 8.950 | 8.800 | 0.150 | 43.4 | 225 | 5.69 | 50.0 |
| 21.005 | 61 | 63 | 8.964 | 0.600 | 8.800 | 8.600 | 0.200 | 44.8 | 225 | 5.49 | 50.0 |
| 23.000 | 62 | 63 | 40.067 | 0.600 | 8.150 | 8.100 | 0.050 | 801.3 | 660 | 5.57 | 50.0 |
| 21.006 | 63 | 64 | 5.792 | 0.600 | 8.600 | 8.150 | 0.450 | 12.9 | 225 | 5.60 | 50.0 |
| 21.007 | 64 | 68 | 9.875 | 0.600 | 8.150 | 7.800 | 0.350 | 28.2 | 225 | 5.66 | 50.0 |
| 24.000 | 65 | 66 | 33.696 | 0.600 | 8.000 | 7.300 | 0.700 | 48.1 | 225 | 5.24 | 50.0 |
| 24.001 | 66 | 67 | 3.544 | 0.600 | 7.300 | 7.270 | 0.030 | 118.1 | 225 | 5.29 | 50.0 |
| 24.002 | 67 | 68 | 37.280 | 0.600 | 7.250 | 7.200 | 0.050 | 745.6 | 660 | 5.80 | 50.0 |
| 21.008 | 68 | 70 | 20.239 | 0.600 | 7.800 | 7.550 | 0.250 | 81.0 | 225 | 6.03 | 50.0 |
| 25.000 | 69 | 70 | 14.194 | 0.600 | 6.700 | 6.600 | 0.100 | 141.9 | 660 | 5.08 | 50.0 |
| 21.009 | 70 | 75 | 5.850 | 0.600 | 7.200 | 6.800 | 0.400 | 14.6 | 225 | 6.06 | 50.0 |
| 26.000 | 71 | 73 | 65.141 | 0.600 | 8.784 | 8.268 | 0.516 | 126.2 | 225 | 5.41 | 50.0 |
| 27.000 | 72 | 73 | 17.544 | 0.600 | 8.400 | 8.268 | 0.132 | 132.9 | 225 | 5.26 | 50.0 |
| 26.001 | 73 | 74 | 11.755 | 0.600 | 8.268 | 7.595 | 0.673 | 17.5 | 225 | 5.47 | 50.0 |
| 26.002 | 74 | 75 | 37.909 | 0.600 | 7.595 | 6.808 | 0.787 | 48.2 | 225 | 5.81 | 50.0 |
| 21.010 | 75 | 77 | 12.442 | 0.600 | 6.808 | 6.144 | 0.664 | 18.7 | 225 | 6.13 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 20.000 | 2.228 | 1176.3 | 0.0 | 0.668 | 0.876 | 0.000 | 0.0 | 0 | 0.000 |
| 1.019 | 5.325 | 376.4 | 75.1 | 0.636 | 0.487 | 0.554 | 0.0 | 91 | 4.191 |
| 1.020 | 1.109 | 1170.8 | 75.1 | 0.627 | 0.534 | 0.554 | 0.0 | 91 | 0.515 |
| 21.000 | 2.105 | 83.7 | 4.5 | 1.251 | 1.214 | 0.033 | 0.0 | 36 | 1.138 |
| 21.001 | 2.651 | 105.4 | 10.1 | 1.214 | 1.005 | 0.074 | 0.0 | 47 | 1.694 |
| 21.002 | 1.375 | 54.7 | 10.9 | 1.005 | 1.002 | 0.081 | 0.0 | 68 | 1.080 |
| 21.003 | 1.450 | 57.6 | 10.9 | 1.002 | 0.880 | 0.081 | 0.0 | 66 | 1.123 |
| 22.000 | 1.854 | 978.8 | 0.0 | 0.895 | 0.995 | 0.000 | 0.0 | 0 | 0.000 |
| 21.004 | 1.991 | 79.2 | 10.9 | 0.880 | 0.734 | 0.081 | 0.0 | 56 | 1.402 |
| 21.005 | 1.959 | 77.9 | 10.9 | 0.734 | 0.659 | 0.081 | 0.0 | 57 | 1.392 |
| 23.000 | 1.170 | 617.9 | 0.0 | 0.451 | 0.724 | 0.000 | 0.0 | 0 | 0.000 |
| 21.006 | 3.666 | 145.8 | 10.9 | 0.659 | 0.921 | 0.081 | 0.0 | 42 | 2.186 |
| 21.007 | 2.472 | 98.3 | 10.9 | 0.921 | 0.923 | 0.081 | 0.0 | 51 | 1.647 |
| 24.000 | 1.890 | 75.1 | 7.9 | 1.365 | 0.932 | 0.058 | 0.0 | 49 | 1.232 |
| 24.001 | 1.202 | 47.8 | 9.2 | 0.932 | 1.026 | 0.068 | 0.0 | 66 | 0.930 |
| 24.002 | 1.214 | 640.8 | 9.2 | 0.611 | 1.088 | 0.068 | 0.0 | 35 | 0.326 |
| 21.008 | 1.454 | 57.8 | 22.0 | 0.923 | 0.547 | 0.162 | 0.0 | 96 | 1.358 |
| 25.000 | 2.798 | 2954.7 | 0.0 | 0.703 | 1.062 | 0.000 | 0.0 | 0 | 0.000 |
| 21.009 | 3.439 | 136.7 | 22.0 | 0.897 | 1.208 | 0.162 | 0.0 | 61 | 2.549 |
| 26.000 | 1.162 | 46.2 | 9.3 | 2.398 | 1.250 | 0.069 | 0.0 | 68 | 0.912 |
| 27.000 | 1.132 | 45.0 | 2.7 | 1.548 | 1.250 | 0.020 | 0.0 | 37 | 0.628 |
| 26.001 | 3.146 | 125.1 | 14.2 | 1.250 | 1.521 | 0.105 | 0.0 | 51 | 2.096 |
| 26.002 | 1.889 | 75.1 | 16.0 | 1.521 | 1.200 | 0.118 | 0.0 | 70 | 1.505 |
| 21.010 | 3.037 | 120.7 | 42.7 | 1.200 | 1.200 | 0.315 | 0.0 | 92 | 2.776 |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 28.000 | 76 | 77 | 25.039 | 0.600 | 6.500 | 6.144 | 0.356 | 70.3 | 225 | 5.27 | 50.0 |
| 21.011 | 77 | 80 | 52.333 | 0.600 | 5.800 | 4.600 | 1.200 | 43.6 | 225 | 6.57 | 50.0 |
| 21.012 | 80 | 79 | 6.782 | 0.600 | 4.600 | 4.550 | 0.050 | 135.6 | 300 | 6.65 | 50.0 |
| 29.000 | 78 | 79 | 39.718 | 0.600 | 5.600 | 4.550 | 1.050 | 37.8 | 225 | 5.31 | 50.0 |
| 21.013 | 79 | 81 | 6.079 | 0.600 | 4.550 | 4.500 | 0.050 | 121.6 | 300 | 6.72 | 50.0 |
| 30.000 | 52 | 53 | 39.059 | 0.600 | 6.300 | 5.350 | 0.950 | 41.1 | 500 | 5.12 | 50.0 |
| 30.001 | 53 | 81 | 4.803 | 0.600 | 4.950 | 4.850 | 0.100 | 48.0 | 225 | 5.16 | 50.0 |
| 1.021 | 81 | 83 | 11.678 | 0.600 | 4.420 | 4.300 | 0.120 | 97.3 | 375 | 6.83 | 50.0 |
| 31.000 | 82 | 83 | 40.500 | 0.600 | 3.700 | 3.680 | 0.020 | 2025.0 | 660 | 5.92 | 50.0 |
| 1.022 | 83 | 87 | 32.362 | 0.600 | 3.680 | 3.650 | 0.030 | 1078.7 | 660 | 7.37 | 50.0 |
| 32.000 | 84 | 86 | 31.430 | 0.600 | 4.400 | 4.100 | 0.300 | 104.8 | 225 | 5.41 | 50.0 |
| 33.000 | 85 | 86 | 8.420 | 0.600 | 4.150 | 4.100 | 0.050 | 168.4 | 225 | 5.14 | 50.0 |
| 32.001 | 86 | 87 | 2.797 | 0.600 | 4.100 | 4.050 | 0.050 | 55.9 | 225 | 5.44 | 50.0 |
| 1.023 | 87 | 89 | 2.417 | 0.600 | 3.650 | 3.630 | 0.020 | 120.8 | 660 | 7.38 | 50.0 |
| 34.000 | 88 | 89 | 32.153 | 0.600 | 3.700 | 3.630 | 0.070 | 459.3 | 660 | 5.61 | 50.0 |
| 1.024 | 89 | 91 | 2.899 | 0.600 | 3.630 | 3.600 | 0.030 | 96.6 | 660 | 7.39 | 50.0 |
| 35.000 | 90 | 91 | 53.593 | 0.600 | 3.650 | 3.600 | 0.050 | 1071.9 | 660 | 5.27 | 50.0 |
| 1.025 | 91 | 91_OUT | 2.660 | 0.600 | 4.000 | 3.900 | 0.100 | 26.6 | 300 | 7.41 | 50.0 |
| 36.000 | 92 | 93 | 8.623 | 0.600 | 6.600 | 6.400 | 0.200 | 43.1 | 225 | 5.07 | 50.0 |
| 36.001 | 93 | 95 | 65.583 | 0.600 | 6.400 | 5.103 | 1.297 | 50.6 | 225 | 5.66 | 50.0 |
| 37.000 | 94 | 95 | 40.619 | 0.600 | 5.358 | 5.103 | 0.255 | 159.3 | 225 | 5.66 | 50.0 |
| 36.002 | 95 | 96 | 43.575 | 0.600 | 5.103 | 4.100 | 1.003 | 43.4 | 225 | 6.03 | 50.0 |
| 36.003 | 96 | 99 | 15.421 | 0.600 | 4.100 | 4.000 | 0.100 | 154.2 | 225 | 6.27 | 50.0 |
| 38.000 | 97 | 98 | 8.665 | 0.600 | 5.329 | 5.060 | 0.269 | 32.2 | 225 | 5.06 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 28.000 | 1.561 | 62.1 | 0.9 | 1.543 | 1.200 | 0.007 | 0.0 | 19 | 0.562 |
| 21.011 | 1.986 | 79.0 | 46.7 | 1.544 | 0.972 | 0.344 | 0.0 | 124 | 2.065 |
| 21.012 | 1.348 | 95.3 | 53.8 | 0.897 | 1.082 | 0.397 | 0.0 | 161 | 1.387 |
| 29.000 | 2.133 | 84.8 | 4.8 | 1.216 | 1.157 | 0.035 | 0.0 | 36 | 1.153 |
| 21.013 | 1.424 | 100.7 | 60.3 | 1.082 | 0.644 | 0.445 | 0.0 | 167 | 1.485 |
| 30.000 | 5.350 | 6152.2 | 0.0 | 0.129 | 0.040 | 0.000 | 0.0 | 0 | 0.000 |
| 30.001 | 1.892 | 75.2 | 0.0 | 0.715 | 0.369 | 0.000 | 0.0 | 0 | 0.000 |
| 1.021 | 1.837 | 202.8 | 135.4 | 0.649 | 0.700 | 0.999 | 0.0 | 224 | 1.961 |
| 31.000 | 0.732 | 772.7 | 1.1 | 0.633 | 1.035 | 0.008 | 0.0 | 9 | 0.079 |
| 1.022 | 1.007 | 531.7 | 136.5 | 1.035 | 0.943 | 1.007 | 0.0 | 235 | 0.727 |
| 32.000 | 1.277 | 50.8 | 4.1 | 0.960 | 1.033 | 0.030 | 0.0 | 43 | 0.768 |
| 33.000 | 1.004 | 39.9 | 1.6 | 1.048 | 1.033 | 0.012 | 0.0 | 30 | 0.489 |
| 32.001 | 1.752 | 69.7 | 5.6 | 1.033 | 0.978 | 0.042 | 0.0 | 43 | 1.055 |
| 1.023 | 3.034 | 1601.7 | 142.2 | 0.943 | 0.747 | 1.049 | 0.0 | 112 | 1.580 |
| 34.000 | 1.550 | 1636.5 | 0.0 | 0.607 | 0.747 | 0.000 | 0.0 | 0 | 0.000 |
| 1.024 | 3.394 | 1792.1 | 142.2 | 0.747 | 0.527 | 1.049 | 0.0 | 104 | 1.701 |
| 35.000 | 1.010 | 1066.8 | 0.0 | 0.499 | 0.527 | 0.000 | 0.0 | 0 | 0.000 |
| 1.025 | 3.060 | 216.3 | 142.2 | 0.487 | 0.797 | 1.049 | 0.0 | 178 | 3.258 |
| 36.000 | 1.997 | 79.4 | 0.4 | 1.246 | 1.349 | 0.003 | 0.0 | 12 | 0.527 |
| 36.001 | 1.843 | 73.3 | 14.9 | 1.349 | 1.240 | 0.110 | 0.0 | 68 | 1.448 |
| 37.000 | 1.033 | 41.1 | 10.3 | 1.677 | 1.240 | 0.076 | 0.0 | 77 | 0.864 |
| 36.002 | 1.990 | 79.1 | 27.9 | 1.240 | 1.271 | 0.206 | 0.0 | 92 | 1.819 |
| 36.003 | 1.050 | 41.8 | 29.0 | 1.271 | 1.255 | 0.214 | 0.0 | 138 | 1.133 |
| 38.000 | 2.313 | 92.0 | 3.5 | 1.200 | 1.200 | 0.025 | 0.0 | 29 | 1.112 |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 38.001 | 98 | 99 | 67.055 | 0.600 | 4.802 | 4.200 | 0.602 | 111.4 | 225 | 5.97 | 50.0 |
| 36.004 | 99 | 106 | 4.167 | 0.600 | 4.000 | 3.950 | 0.050 | 83.3 | 225 | 6.32 | 50.0 |
| 39.000 | 100 | 101 | 32.721 | 0.600 | 5.900 | 5.500 | 0.400 | 81.8 | 500 | 5.14 | 50.0 |
| 39.001 | 101 | 102 | 7.495 | 0.600 | 5.500 | 5.400 | 0.100 | 75.0 | 500 | 5.18 | 50.0 |
| 39.002 | 102 | 103 | 26.383 | 0.600 | 5.400 | 4.850 | 0.550 | 48.0 | 500 | 5.26 | 50.0 |
| 39.003 | 103 | 106 | 3.809 | 0.600 | 4.450 | 4.400 | 0.050 | 76.2 | 225 | 5.31 | 50.0 |
| 40.000 | 104 | 105 | 14.184 | 0.600 | 3.550 | 3.500 | 0.050 | 283.7 | 660 | 5.12 | 50.0 |
| 40.001 | 105 | 106 | 6.870 | 0.600 | 3.500 | 3.450 | 0.050 | 137.4 | 660 | 5.16 | 50.0 |
| 36.005 | 106 | 107 | 12.118 | 0.600 | 3.950 | 3.900 | 0.050 | 242.4 | 300 | 6.52 | 50.0 |
| 36.006 | 107 | 110 | 19.485 | 0.600 | 3.400 | 3.350 | 0.050 | 389.7 | 660 | 6.72 | 50.0 |
| 41.000 | 108 | 109 | 10.482 | 0.600 | 4.013 | 3.900 | 0.113 | 92.8 | 225 | 5.13 | 50.0 |
| 41.001 | 109 | 110 | 7.074 | 0.600 | 3.900 | 3.800 | 0.100 | 70.7 | 225 | 5.20 | 50.0 |
| 36.007 | 110 | 111 | 11.278 | 0.600 | 3.350 | 3.300 | 0.050 | 225.6 | 660 | 6.80 | 50.0 |
| 42.000 | 121 | 111 | 5.980 | 0.600 | 3.800 | 3.700 | 0.100 | 59.8 | 225 | 5.06 | 50.0 |
| 36.008 | 111 | 115 | 3.937 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 6.87 | 50.0 |
| 43.001 | 113 | 114 | 6.336 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 5.21 | 50.0 |
| 43.002 | 114 | 115 | 11.278 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 5.40 | 50.0 |
| 36.009 | 115 | 119 | 2.420 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 6.91 | 50.0 |
| 43.000 | 112 | 113 | 6.205 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 5.10 | 50.0 |
| 45.000 | 113 | 119 | 12.142 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 5.20 | 50.0 |
| 44.000 | 112 | 117 | 14.153 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 5.24 | 50.0 |
| 44.001 | 117 | 119 | 2.331 | 0.600 | 3.300 | 3.300 | 0.000 | 0.0 | 660 | 5.27 | 50.0 |
| 36.010 | 119 | 123 | 14.685 | 0.600 | 3.900 | 3.150 | 0.750 | 19.6 | 225 | 6.99 | 50.0 |
| 46.000 | 120 | 123 | 28.901 | 0.600 | 2.600 | 2.550 | 0.050 | 578.0 | 660 | 5.35 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 38.001 | 1.238 | 49.2 | 3.6 | 1.458 | 1.055 | 0.026 | 0.0 | 41 | 0.725 |
| 36.004 | 1.433 | 57.0 | 32.5 | 1.255 | 1.376 | 0.240 | 0.0 | 122 | 1.478 |
| 39.000 | 3.789 | 4357.2 | 8.1 | 0.073 | 0.006 | 0.060 | 0.0 | 27 | 0.757 |
| 39.001 | 3.959 | 4552.5 | 8.1 | 0.006 | 0.049 | 0.060 | 0.0 | 26 | 0.775 |
| 39.002 | 4.952 | 5694.6 | 8.1 | 0.049 | 0.048 | 0.060 | 0.0 | 23 | 0.908 |
| 39.003 | 1.499 | 59.6 | 8.1 | 0.723 | 0.926 | 0.060 | 0.0 | 56 | 1.055 |
| 40.000 | 1.975 | 2086.0 | 0.9 | 0.943 | 0.607 | 0.006 | 0.0 | 4 | 0.125 |
| 40.001 | 2.844 | 3003.2 | 0.9 | 0.607 | 1.441 | 0.006 | 0.0 | 4 | 0.162 |
| 36.005 | 1.005 | 71.1 | 41.5 | 1.301 | 1.389 | 0.306 | 0.0 | 165 | 1.043 |
| 36.006 | 1.684 | 1777.8 | 41.5 | 1.529 | 1.496 | 0.306 | 0.0 | 47 | 0.545 |
| 41.000 | 1.358 | 54.0 | 0.0 | 1.200 | 1.231 | 0.000 | 0.0 | 0 | 0.000 |
| 41.001 | 1.556 | 61.9 | 14.3 | 1.231 | 1.481 | 0.106 | 0.0 | 73 | 1.272 |
| 36.007 | 2.217 | 1170.5 | 55.8 | 1.496 | 1.280 | 0.412 | 0.0 | 75 | 0.934 |
| 42.000 | 1.694 | 67.4 | 8.9 | 1.249 | 1.315 | 0.066 | 0.0 | 55 | 1.182 |
| 36.008 | 1.000 | 528.0 | 64.7 | 1.280 | 1.197 | 0.477 | 0.0 | 0 | ∞ |
| 43.001 | 1.000 | 1056.0 | 0.1 | 1.552 | 1.582 | 0.001 | 0.0 | 0 | ∞ |
| 43.002 | 1.000 | 1056.0 | 0.1 | 1.582 | 1.197 | 0.001 | 0.0 | 0 | ∞ |
| 36.009 | 1.000 | 528.0 | 64.8 | 1.197 | 1.154 | 0.478 | 0.0 | 0 | ∞ |
| 43.000 | 1.000 | 1056.0 | 0.1 | 1.406 | 1.552 | 0.001 | 0.0 | 0 | ∞ |
| 45.000 | 1.000 | 528.0 | 0.0 | 1.552 | 1.154 | 0.000 | 0.0 | 0 | 0.000 |
| 44.000 | 1.000 | 528.0 | 0.0 | 1.406 | 1.057 | 0.000 | 0.0 | 0 | 0.000 |
| 44.001 | 1.000 | 528.0 | 0.0 | 1.057 | 1.154 | 0.000 | 0.0 | 0 | 0.000 |
| 36.010 | 2.970 | 118.1 | 64.8 | 0.989 | 0.948 | 0.478 | 0.0 | 119 | 3.038 |
| 46.000 | 1.380 | 728.7 | 0.0 | 1.739 | 1.113 | 0.000 | 0.0 | 0 | 0.000 |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.000 | 122 | 123 | 10.448 | 0.600 | 3.350 | 3.150 | 0.200 | 52.2 | 225 | 5.10 | 50.0 |
| 36.011 | 123 | 125 | 3.545 | 0.600 | 3.100 | 3.050 | 0.050 | 70.9 | 300 | 7.02 | 50.0 |
| 48.000 | 124 | 125 | 11.614 | 0.600 | 2.550 | 2.500 | 0.050 | 232.3 | 660 | 5.09 | 50.0 |
| 36.012 | 125 | 127 | 4.048 | 0.600 | 3.050 | 3.000 | 0.050 | 81.0 | 300 | 7.06 | 50.0 |
| 49.000 | 126 | 127 | 10.665 | 0.600 | 2.550 | 2.500 | 0.050 | 213.3 | 660 | 5.08 | 50.0 |
| 36.013 | 127 | 129 | 3.267 | 0.600 | 3.000 | 2.950 | 0.050 | 65.3 | 300 | 7.09 | 50.0 |
| 50.000 | 128 | 129 | 10.106 | 0.600 | 2.500 | 2.450 | 0.050 | 202.1 | 660 | 5.07 | 50.0 |
| 36.014 | 129 | 131 | 4.005 | 0.600 | 2.950 | 2.900 | 0.050 | 80.1 | 300 | 7.13 | 50.0 |
| 51.000 | 130 | 131 | 17.261 | 0.600 | 2.450 | 2.400 | 0.050 | 345.2 | 660 | 5.16 | 50.0 |
| 36.015 | 131 | 131_OUT | 4.554 | 0.600 | 2.900 | 2.850 | 0.050 | 91.1 | 300 | 7.17 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 47.000 | 1.813 | 72.1 | 0.0 | 1.205 | 0.948 | 0.000 | 0.0 | 0 | 0.000 |
| 36.011 | 1.869 | 132.1 | 64.8 | 0.923 | 1.289 | 0.478 | 0.0 | 149 | 1.862 |
| 48.000 | 2.184 | 1153.3 | 2.3 | 1.111 | 1.479 | 0.017 | 0.0 | 11 | 0.273 |
| 36.012 | 1.749 | 123.6 | 67.1 | 1.289 | 1.281 | 0.495 | 0.0 | 158 | 1.784 |
| 49.000 | 2.280 | 1203.9 | 0.0 | 0.990 | 1.421 | 0.000 | 0.0 | 0 | 0.000 |
| 36.013 | 1.948 | 137.7 | 67.1 | 1.281 | 1.200 | 0.495 | 0.0 | 148 | 1.937 |
| 50.000 | 2.343 | 1236.9 | 0.0 | 0.840 | 1.340 | 0.000 | 0.0 | 0 | 0.000 |
| 36.014 | 1.758 | 124.3 | 67.1 | 1.200 | 1.194 | 0.495 | 0.0 | 157 | 1.791 |
| 51.000 | 1.789 | 944.9 | 0.0 | 1.410 | 1.334 | 0.000 | 0.0 | 0 | 0.000 |
| 36.015 | 1.648 | 116.5 | 67.1 | 1.194 | 0.850 | 0.495 | 0.0 | 164 | 1.705 |

## 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 | 57.019 | 48.3 | 225 | Circular_storm | 13.594 | 12.030 | 1.339 | 12.590 | 10.850 | 1.515 |
| 1.001 | 9.515 | 190.3 | 225 | Circular_storm | 12.590 | 10.850 | 1.515 | 12.274 | 10.800 | 1.249 |
| 3.000 | 14.600 | 146.0 | 225 | Circular_storm | 12.549 | 10.975 | 1.349 | 12.412 | 10.875 | 1.312 |
| 3.001 | 3.766 | 50.2 | 225 | Circular_storm | 12.412 | 10.875 | 1.312 | 12.274 | 10.800 | 1.249 |
| 2.000 | 19.818 | 132.1 | 500 | Swale | 12.445 | 11.900 | 0.045 | 12.274 | 11.750 | 0.024 |
| 1.002 | 9.267 | 185.3 | 225 | Circular_storm | 12.274 | 10.800 | 1.249 | 11.822 | 10.750 | 0.847 |
| 4.000 | 25.811 | 516.2 | 660 | Stormblock Dual | 11.944 | 10.500 | 0.784 | 11.822 | 10.450 | 0.712 |
| 1.003 | 4.866 | 48.7 | 225 | Circular_storm | 11.822 | 11.000 | 0.597 | 11.600 | 10.900 | 0.475 |
| 5.000 | 28.106 | 562.1 | 660 | Stormblock Dual | 11.673 | 10.350 | 0.663 | 11.600 | 10.300 | 0.640 |
| 1.004 | 10.323 | 41.3 | 225 | Circular_storm | 11.600 | 10.900 | 0.475 | 11.495 | 10.650 | 0.620 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 1.000 | 1 | 1200 | Manhole | Adoptable | 2 | 1200 | Manhole | Adoptable |
| 1.001 | 2 | 1200 | Manhole | Adoptable | 6 | 5200 | Manhole | Adoptable |
| 3.000 | 3 | 1200 | Manhole | Adoptable | 4 | 1200 | Manhole | Adoptable |
| 3.001 | 4 | 1200 | Manhole | Adoptable | 6 | 5200 | Manhole | Adoptable |
| 2.000 | 5 | | Junction | | 6 | 5200 | Manhole | Adoptable |
| 1.002 | 6 | 5200 | Manhole | Adoptable | 8 | 2500 | Manhole | 1 STANDARD |
| 4.000 | 7 | | Junction | | 8 | 2500 | Manhole | 1 STANDARD |
| 1.003 | 8 | 2500 | Manhole | 1 STANDARD | 10 | 2500 | Manhole | Adoptable |
| 5.000 | 9 | | Junction | | 10 | 2500 | Manhole | Adoptable |
| 1.004 | 10 | 2500 | Manhole | Adoptable | 12 | 2500 | Manhole | Adoptable |

## Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.000 | 24.000 | 1000.0 | 660 | Stormblock Dual | 11.180 | 10.044 | 0.476 | 11.495 | 10.020 | 0.815 |
| 1.005 | 19.991 | 44.4 | 225 | Circular_storm | 11.495 | 10.650 | 0.620 | 11.033 | 10.200 | 0.608 |
| 7.000 | 30.730 | 1536.5 | 660 | Stormblock Dual | 10.907 | 9.620 | 0.627 | 11.033 | 9.600 | 0.773 |
| 1.006 | 24.610 | 27.3 | 225 | Circular_storm | 11.033 | 10.200 | 0.608 | 10.349 | 9.300 | 0.824 |
| 8.000 | 33.999 | 152.5 | 225 | Circular_storm | 12.795 | 11.350 | 1.220 | 12.938 | 11.127 | 1.586 |
| 8.001 | 48.755 | 36.7 | 225 | Circular_storm | 12.938 | 11.127 | 1.586 | 11.436 | 9.800 | 1.411 |
| 8.002 | 23.653 | 118.3 | 225 | Circular_storm | 11.436 | 9.800 | 1.411 | 11.147 | 9.600 | 1.322 |
| 8.003 | 12.919 | 25.5 | 225 | Circular_storm | 11.147 | 9.357 | 1.565 | 10.505 | 8.850 | 1.430 |
| 8.004 | 9.971 | 199.4 | 225 | Circular_storm | 10.505 | 8.850 | 1.430 | 10.534 | 8.800 | 1.509 |
| 9.000 | 47.107 | 31.9 | 225 | Circular_storm | 11.809 | 10.341 | 1.243 | 10.534 | 8.865 | 1.444 |
| 8.005 | 3.631 | 72.6 | 225 | Circular_storm | 10.534 | 8.800 | 1.509 | 10.349 | 8.750 | 1.374 |
| 10.000 | 47.479 | 949.6 | 660 | Stormblock Dual | 10.477 | 8.800 | 1.017 | 10.349 | 8.750 | 0.939 |
| 1.007 | 4.049 | 20.2 | 225 | Circular_storm | 10.349 | 9.300 | 0.824 | 10.104 | 9.100 | 0.779 |
| 11.000 | 38.612 | 772.2 | 660 | Stormblock Dual | 10.244 | 8.550 | 1.034 | 10.104 | 8.500 | 0.944 |
| 1.008 | 5.066 | 25.3 | 225 | Circular_storm | 10.104 | 9.100 | 0.779 | 9.798 | 8.900 | 0.673 |
| 12.000 | 25.952 | 259.5 | 660 | Stormblock Dual | 10.183 | 8.400 | 1.123 | 9.798 | 8.300 | 0.838 |
| 1.009 | 4.876 | 24.4 | 225 | Circular_storm | 9.798 | 8.900 | 0.673 | 9.561 | 8.700 | 0.636 |
| 13.000 | 16.566 | 331.3 | 660 | Stormblock | 9.776 | 8.300 | 0.816 | 9.561 | 8.250 | 0.651 |
| 1.010 | 4.900 | 24.5 | 225 | Circular_storm | 9.561 | 8.700 | 0.636 | 9.327 | 8.500 | 0.602 |
| 14.000 | 12.126 | 242.5 | 660 | Stormblock | 9.313 | 8.050 | 0.603 | 9.327 | 8.000 | 0.667 |
| 1.011 | 8.712 | 17.4 | 225 | Circular_storm | 9.327 | 8.500 | 0.602 | 8.723 | 8.000 | 0.498 |
| 1.012 | 45.515 | 50.8 | 225 | Circular_storm | 8.723 | 7.546 | 0.952 | 7.525 | 6.650 | 0.650 |
| 1.013 | 7.085 | 47.2 | 225 | Circular_storm | 7.525 | 6.650 | 0.650 | 7.354 | 6.500 | 0.629 |
| 1.014 | 7.926 | 79.3 | 225 | Circular_storm | 7.354 | 6.500 | 0.629 | 7.189 | 6.400 | 0.564 |
| 1.015 | 6.031 | 40.2 | 225 | Circular_storm | 7.189 | 6.400 | 0.564 | 7.212 | 6.250 | 0.737 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 11 | | Junction | | 12 | 2500 | Manhole | Adoptable |
| 1.005 | 12 | 2500 | Manhole | Adoptable | 14 | 2500 | Manhole | Adoptable |
| 7.000 | 13 | | Junction | | 14 | 2500 | Manhole | Adoptable |
| 1.006 | 14 | 2500 | Manhole | Adoptable | 23 | | Junction | |
| 8.000 | 15 | 1200 | Manhole | Adoptable | 16 | 1200 | Manhole | Adoptable |
| 8.001 | 16 | 1200 | Manhole | Adoptable | 17 | 1200 | Manhole | Adoptable |
| 8.002 | 17 | 1200 | Manhole | Adoptable | 18 | 1200 | Manhole | Adoptable |
| 8.003 | 18 | 1200 | Manhole | Adoptable | 19 | 1200 | Manhole | Adoptable |
| 8.004 | 19 | 1200 | Manhole | Adoptable | 21 | 1200 | Manhole | Adoptable |
| 9.000 | 20 | 1200 | Manhole | Adoptable | 21 | 1200 | Manhole | Adoptable |
| 8.005 | 21 | 1200 | Manhole | Adoptable | 23 | | Junction | |
| 10.000 | 22 | | Junction | | 23 | | Junction | |
| 1.007 | 23 | | Junction | | 25 | 2500 | Manhole | 1 STANDARD |
| 11.000 | 24 | | Junction | | 25 | 2500 | Manhole | 1 STANDARD |
| 1.008 | 25 | 2500 | Manhole | 1 STANDARD | 27 | 2500 | Manhole | 1 STANDARD |
| 12.000 | 26 | | Junction | | 27 | 2500 | Manhole | 1 STANDARD |
| 1.009 | 27 | 2500 | Manhole | 1 STANDARD | 29 | 1800 | Manhole | 1 STANDARD |
| 13.000 | 28 | | Junction | | 29 | 1800 | Manhole | 1 STANDARD |
| 1.010 | 29 | 1800 | Manhole | 1 STANDARD | 31 | 1800 | Manhole | 1 STANDARD |
| 14.000 | 30 | | Junction | | 31 | 1800 | Manhole | 1 STANDARD |
| 1.011 | 31 | 1800 | Manhole | 1 STANDARD | 32 | 1200 | Manhole | Adoptable |
| 1.012 | 32 | 1200 | Manhole | Adoptable | 33 | 1200 | Manhole | Adoptable |
| 1.013 | 33 | 1200 | Manhole | Adoptable | 34 | 1200 | Manhole | Adoptable |
| 1.014 | 34 | 1200 | Manhole | Adoptable | 35 | 1200 | Manhole | Adoptable |
| 1.015 | 35 | 1200 | Manhole | Adoptable | 45 | 2500 | Manhole | Adoptable |

## 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 | 11.219 | 17.3 | 500 | Swale | 9.700 | 9.150 | 0.050 | 9.058 | 8.500 | 0.058 |
| 15.001 | 23.425 | 23.4 | 500 | Swale | 9.058 | 8.500 | 0.058 | 8.108 | 7.500 | 0.108 |
| 15.002 | 41.455 | 55.3 | 500 | Swale | 8.108 | 7.500 | 0.108 | 7.270 | 6.750 | 0.020 |
| 16.000 | 36.072 | 120.2 | 225 | Circular_storm | 7.878 | 6.300 | 1.353 | 7.234 | 6.000 | 1.009 |
| 16.001 | 2.242 | 44.8 | 225 | Circular_storm | 7.234 | 6.000 | 1.009 | 7.270 | 5.950 | 1.095 |
| 15.003 | 3.606 | 72.1 | 225 | Circular_storm | 7.270 | 5.950 | 1.095 | 7.212 | 5.900 | 1.087 |
| 17.000 | 42.361 | 30.3 | 225 | Circular_storm | 9.588 | 7.300 | 2.063 | 7.354 | 5.903 | 1.226 |
| 17.001 | 9.893 | 96.0 | 225 | Circular_storm | 7.354 | 5.903 | 1.226 | 7.212 | 5.800 | 1.187 |
| 18.000 | 22.482 | 224.8 | 660 | Stormblock Dual | 6.991 | 5.400 | 0.931 | 7.212 | 5.300 | 1.252 |
| 1.016 | 3.694 | 73.9 | 300 | Circular_storm | 7.212 | 5.850 | 1.062 | 6.879 | 5.800 | 0.779 |
| 1.017 | 10.935 | 109.3 | 300 | Circular_storm | 6.879 | 5.800 | 0.779 | 6.756 | 5.700 | 0.756 |
| 19.000 | 22.029 | 440.6 | 660 | Stormblock | 6.533 | 5.250 | 0.623 | 6.756 | 5.200 | 0.896 |
| 1.018 | 3.277 | 8.2 | 300 | Circular_storm | 6.756 | 5.700 | 0.756 | 6.236 | 5.300 | 0.636 |
| 20.000 | 11.168 | 223.4 | 660 | Stormblock | 6.078 | 4.750 | 0.668 | 6.236 | 4.700 | 0.876 |
| 1.019 | 4.408 | 8.8 | 300 | Circular_storm | 6.236 | 5.300 | 0.636 | 5.587 | 4.800 | 0.487 |
| 1.020 | 44.590 | 891.8 | 660 | Stormblock Dual | 5.587 | 4.300 | 0.627 | 5.444 | 4.250 | 0.534 |
| 21.000 | 34.965 | 38.9 | 225 | Circular_storm | 12.776 | 11.300 | 1.251 | 11.839 | 10.400 | 1.214 |
| 21.001 | 31.916 | 24.6 | 225 | Circular_storm | 11.839 | 10.400 | 1.214 | 10.330 | 9.100 | 1.005 |
| 21.002 | 9.043 | 90.4 | 225 | Circular_storm | 10.330 | 9.100 | 1.005 | 10.227 | 9.000 | 1.002 |
| 21.003 | 4.072 | 81.4 | 225 | Circular_storm | 10.227 | 9.000 | 1.002 | 10.055 | 8.950 | 0.880 |
| 22.000 | 16.094 | 321.9 | 660 | Stormblock | 10.005 | 8.450 | 0.895 | 10.055 | 8.400 | 0.995 |
| 21.004 | 6.509 | 43.4 | 225 | Circular_storm | 10.055 | 8.950 | 0.880 | 9.759 | 8.800 | 0.734 |
| 21.005 | 8.964 | 44.8 | 225 | Circular_storm | 9.759 | 8.800 | 0.734 | 9.484 | 8.600 | 0.659 |
| 23.000 | 40.067 | 801.3 | 660 | Stormblock | 9.261 | 8.150 | 0.451 | 9.484 | 8.100 | 0.724 |
| 21.006 | 5.792 | 12.9 | 225 | Circular_storm | 9.484 | 8.600 | 0.659 | 9.296 | 8.150 | 0.921 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 15.000 | 36 | | Junction | | 37 | | Junction | |
| 15.001 | 37 | | Junction | | 38 | | Junction | |
| 15.002 | 38 | | Junction | | 41 | 5200 | Manhole | Adoptable |
| 16.000 | 39 | 1200 | Manhole | Adoptable | 40 | 1200 | Manhole | Adoptable |
| 16.001 | 40 | 1200 | Manhole | Adoptable | 41 | 5200 | Manhole | Adoptable |
| 15.003 | 41 | 5200 | Manhole | Adoptable | 45 | 2500 | Manhole | Adoptable |
| 17.000 | 42 | 1200 | Manhole | Adoptable | 43 | 1200 | Manhole | Adoptable |
| 17.001 | 43 | 1200 | Manhole | Adoptable | 45 | 2500 | Manhole | Adoptable |
| 18.000 | 44 | | Junction | | 45 | 2500 | Manhole | Adoptable |
| 1.016 | 45 | 2500 | Manhole | Adoptable | 46 | 1500 | Manhole | Adoptable |
| 1.017 | 46 | 1500 | Manhole | Adoptable | 48 | 1800 | Manhole | Adoptable |
| 19.000 | 47 | | Junction | | 48 | 1800 | Manhole | Adoptable |
| 1.018 | 48 | 1800 | Manhole | Adoptable | 50 | 1800 | Manhole | Adoptable |
| 20.000 | 49 | | Junction | | 50 | 1800 | Manhole | Adoptable |
| 1.019 | 50 | 1800 | Manhole | Adoptable | 51 | 2500 | Manhole | Adoptable |
| 1.020 | 51 | 2500 | Manhole | Adoptable | 81 | 2500 | Manhole | 1 STANDARD |
| 21.000 | 55 | 1200 | Manhole | Adoptable | 56 | 1200 | Manhole | Adoptable |
| 21.001 | 56 | 1200 | Manhole | Adoptable | 57 | 1200 | Manhole | Adoptable |
| 21.002 | 57 | 1200 | Manhole | Adoptable | 58 | 1200 | Manhole | Adoptable |
| 21.003 | 58 | 1200 | Manhole | Adoptable | 60 | 1800 | Manhole | 1 STANDARD |
| 22.000 | 59 | | Junction | | 60 | 1800 | Manhole | 1 STANDARD |
| 21.004 | 60 | 1800 | Manhole | 1 STANDARD | 61 | 1200 | Manhole | Adoptable |
| 21.005 | 61 | 1200 | Manhole | Adoptable | 63 | 1800 | Manhole | Adoptable |
| 23.000 | 62 | | Junction | | 63 | 1800 | Manhole | Adoptable |
| 21.006 | 63 | 1800 | Manhole | Adoptable | 64 | 1200 | Manhole | Adoptable |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 21.007 | 9.875 | 28.2 | 225 | Circular_storm | 9.296 | 8.150 | 0.921 | 8.948 | 7.800 | 0.923 |
| 24.000 | 33.696 | 48.1 | 225 | Circular_storm | 9.590 | 8.000 | 1.365 | 8.457 | 7.300 | 0.932 |
| 24.001 | 3.544 | 118.1 | 225 | Circular_storm | 8.457 | 7.300 | 0.932 | 8.521 | 7.270 | 1.026 |
| 24.002 | 37.280 | 745.6 | 660 | Stormblock | 8.521 | 7.250 | 0.611 | 8.948 | 7.200 | 1.088 |
| 21.008 | 20.239 | 81.0 | 225 | Circular_storm | 8.948 | 7.800 | 0.923 | 8.322 | 7.550 | 0.547 |
| 25.000 | 14.194 | 141.9 | 660 | Stormblock Dual | 8.063 | 6.700 | 0.703 | 8.322 | 6.600 | 1.062 |
| 21.009 | 5.850 | 14.6 | 225 | Circular_storm | 8.322 | 7.200 | 0.897 | 8.233 | 6.800 | 1.208 |
| 26.000 | 65.141 | 126.2 | 225 | Circular_storm | 11.407 | 8.784 | 2.398 | 9.743 | 8.268 | 1.250 |
| 27.000 | 17.544 | 132.9 | 225 | Circular_storm | 10.173 | 8.400 | 1.548 | 9.743 | 8.268 | 1.250 |
| 26.001 | 11.755 | 17.5 | 225 | Circular_storm | 9.743 | 8.268 | 1.250 | 9.341 | 7.595 | 1.521 |
| 26.002 | 37.909 | 48.2 | 225 | Circular_storm | 9.341 | 7.595 | 1.521 | 8.233 | 6.808 | 1.200 |
| 21.010 | 12.442 | 18.7 | 225 | Circular_storm | 8.233 | 6.808 | 1.200 | 7.569 | 6.144 | 1.200 |
| 28.000 | 25.039 | 70.3 | 225 | Circular_storm | 8.268 | 6.500 | 1.543 | 7.569 | 6.144 | 1.200 |
| 21.011 | 52.333 | 43.6 | 225 | Circular_storm | 7.569 | 5.800 | 1.544 | 5.797 | 4.600 | 0.972 |
| 21.012 | 6.782 | 135.6 | 300 | Circular_storm | 5.797 | 4.600 | 0.897 | 5.932 | 4.550 | 1.082 |
| 29.000 | 39.718 | 37.8 | 225 | Circular_storm | 7.041 | 5.600 | 1.216 | 5.932 | 4.550 | 1.157 |
| 21.013 | 6.079 | 121.6 | 300 | Circular_storm | 5.932 | 4.550 | 1.082 | 5.444 | 4.500 | 0.644 |
| 30.000 | 39.059 | 41.1 | 500 | Swale | 6.929 | 6.300 | 0.129 | 5.890 | 5.350 | 0.040 |
| 30.001 | 4.803 | 48.0 | 225 | Circular_storm | 5.890 | 4.950 | 0.715 | 5.444 | 4.850 | 0.369 |
| 1.021 | 11.678 | 97.3 | 375 | Circular_storm | 5.444 | 4.420 | 0.649 | 5.375 | 4.300 | 0.700 |
| 31.000 | 40.500 | 2025.0 | 660 | Stormblock Dual | 4.993 | 3.700 | 0.633 | 5.375 | 3.680 | 1.035 |
| 1.022 | 32.362 | 1078.7 | 660 | Stormblock | 5.375 | 3.680 | 1.035 | 5.253 | 3.650 | 0.943 |
| 32.000 | 31.430 | 104.8 | 225 | Circular_storm | 5.585 | 4.400 | 0.960 | 5.358 | 4.100 | 1.033 |
| 33.000 | 8.420 | 168.4 | 225 | Circular_storm | 5.423 | 4.150 | 1.048 | 5.358 | 4.100 | 1.033 |
| 32.001 | 2.797 | 55.9 | 225 | Circular_storm | 5.358 | 4.100 | 1.033 | 5.253 | 4.050 | 0.978 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 21.007 | 64 | 1200 | Manhole | Adoptable | 68 | 1800 | Manhole | Adoptable |
| 24.000 | 65 | 1200 | Manhole | Adoptable | 66 | 1200 | Manhole | 1 STANDARD |
| 24.001 | 66 | 1200 | Manhole | 1 STANDARD | 67 | 1800 | Manhole | 1 STANDARD |
| 24.002 | 67 | 1800 | Manhole | 1 STANDARD | 68 | 1800 | Manhole | Adoptable |
| 21.008 | 68 | 1800 | Manhole | Adoptable | 70 | 2500 | Manhole | Adoptable |
| 25.000 | 69 | | Junction | | 70 | 2500 | Manhole | Adoptable |
| 21.009 | 70 | 2500 | Manhole | Adoptable | 75 | 1200 | Manhole | Adoptable |
| 26.000 | 71 | 1200 | Manhole | Adoptable | 73 | 1200 | Manhole | Adoptable |
| 27.000 | 72 | 1200 | Manhole | Adoptable | 73 | 1200 | Manhole | Adoptable |
| 26.001 | 73 | 1200 | Manhole | Adoptable | 74 | 1350 | Manhole | 1 STANDARD |
| 26.002 | 74 | 1350 | Manhole | 1 STANDARD | 75 | 1200 | Manhole | Adoptable |
| 21.010 | 75 | 1200 | Manhole | Adoptable | 77 | 1350 | Manhole | 1 STANDARD |
| 28.000 | 76 | 1350 | Manhole | 1 STANDARD | 77 | 1350 | Manhole | 1 STANDARD |
| 21.011 | 77 | 1350 | Manhole | 1 STANDARD | 80 | 1200 | Manhole | Adoptable |
| 21.012 | 80 | 1200 | Manhole | Adoptable | 79 | 1200 | Manhole | 1 STANDARD |
| 29.000 | 78 | 1200 | Manhole | Adoptable | 79 | 1200 | Manhole | 1 STANDARD |
| 21.013 | 79 | 1200 | Manhole | 1 STANDARD | 81 | 2500 | Manhole | 1 STANDARD |
| 30.000 | 52 | | Junction | | 53 | 5200 | Manhole | 1 STANDARD |
| 30.001 | 53 | 5200 | Manhole | 1 STANDARD | 81 | 2500 | Manhole | 1 STANDARD |
| 1.021 | 81 | 2500 | Manhole | 1 STANDARD | 83 | 2500 | Manhole | 1 STANDARD |
| 31.000 | 82 | | Junction | | 83 | 2500 | Manhole | 1 STANDARD |
| 1.022 | 83 | 2500 | Manhole | 1 STANDARD | 87 | 1800 | Manhole | 1 STANDARD |
| 32.000 | 84 | | Junction | | 86 | 1200 | Manhole | Adoptable |
| 33.000 | 85 | 1200 | Manhole | Adoptable | 86 | 1200 | Manhole | Adoptable |
| 32.001 | 86 | 1200 | Manhole | Adoptable | 87 | 1800 | Manhole | 1 STANDARD |

## 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 | 2.417 | 120.8 | 660 | Stormblock | 5.253 | 3.650 | 0.943 | 5.037 | 3.630 | 0.747 |
| 34.000 | 32.153 | 459.3 | 660 | Stormblock Dual | 4.967 | 3.700 | 0.607 | 5.037 | 3.630 | 0.747 |
| 1.024 | 2.899 | 96.6 | 660 | Stormblock | 5.037 | 3.630 | 0.747 | 4.787 | 3.600 | 0.527 |
| 35.000 | 53.593 | 1071.9 | 660 | Stormblock Dual | 4.809 | 3.650 | 0.499 | 4.787 | 3.600 | 0.527 |
| 1.025 | 2.660 | 26.6 | 300 | Circular_storm | 4.787 | 4.000 | 0.487 | 4.997 | 3.900 | 0.797 |
| 36.000 | 8.623 | 43.1 | 225 | Circular_storm | 8.071 | 6.600 | 1.246 | 7.974 | 6.400 | 1.349 |
| 36.001 | 65.583 | 50.6 | 225 | Circular_storm | 7.974 | 6.400 | 1.349 | 6.568 | 5.103 | 1.240 |
| 37.000 | 40.619 | 159.3 | 225 | Circular_storm | 7.260 | 5.358 | 1.677 | 6.568 | 5.103 | 1.240 |
| 36.002 | 43.575 | 43.4 | 225 | Circular_storm | 6.568 | 5.103 | 1.240 | 5.596 | 4.100 | 1.271 |
| 36.003 | 15.421 | 154.2 | 225 | Circular_storm | 5.596 | 4.100 | 1.271 | 5.480 | 4.000 | 1.255 |
| 38.000 | 8.665 | 32.2 | 225 | Circular_storm | 6.754 | 5.329 | 1.200 | 6.485 | 5.060 | 1.200 |
| 38.001 | 67.055 | 111.4 | 225 | Circular_storm | 6.485 | 4.802 | 1.458 | 5.480 | 4.200 | 1.055 |
| 36.004 | 4.167 | 83.3 | 225 | Circular_storm | 5.480 | 4.000 | 1.255 | 5.551 | 3.950 | 1.376 |
| 39.000 | 32.721 | 81.8 | 500 | Swale | 6.473 | 5.900 | 0.073 | 6.006 | 5.500 | 0.006 |
| 39.001 | 7.495 | 75.0 | 500 | Swale | 6.006 | 5.500 | 0.006 | 5.949 | 5.400 | 0.049 |
| 39.002 | 26.383 | 48.0 | 500 | Swale | 5.949 | 5.400 | 0.049 | 5.398 | 4.850 | 0.048 |
| 39.003 | 3.809 | 76.2 | 225 | Circular_storm | 5.398 | 4.450 | 0.723 | 5.551 | 4.400 | 0.926 |
| 40.000 | 14.184 | 283.7 | 660 | Stormblock Dual | 5.153 | 3.550 | 0.943 | 4.767 | 3.500 | 0.607 |
| 40.001 | 6.870 | 137.4 | 660 | Stormblock Dual | 4.767 | 3.500 | 0.607 | 5.551 | 3.450 | 1.441 |
| 36.005 | 12.118 | 242.4 | 300 | Circular_storm | 5.551 | 3.950 | 1.301 | 5.589 | 3.900 | 1.389 |
| 36.006 | 19.485 | 389.7 | 660 | Stormblock Dual | 5.589 | 3.400 | 1.529 | 5.506 | 3.350 | 1.496 |
| 41.000 | 10.482 | 92.8 | 225 | Circular_storm | 5.438 | 4.013 | 1.200 | 5.356 | 3.900 | 1.231 |
| 41.001 | 7.074 | 70.7 | 225 | Circular_storm | 5.356 | 3.900 | 1.231 | 5.506 | 3.800 | 1.481 |
| 36.007 | 11.278 | 225.6 | 660 | Stormblock | 5.506 | 3.350 | 1.496 | 5.240 | 3.300 | 1.280 |
| 42.000 | 5.980 | 59.8 | 225 | Circular_storm | 5.274 | 3.800 | 1.249 | 5.240 | 3.700 | 1.315 |

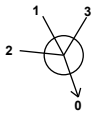
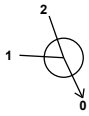
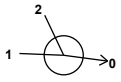
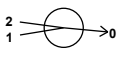
| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 1.023 | 87 | 1800 | Manhole | 1 STANDARD | 89 | | Junction | |
| 34.000 | 88 | | Junction | | 89 | | Junction | |
| 1.024 | 89 | | Junction | | 91 | | Junction | |
| 35.000 | 90 | | Junction | | 91 | | Junction | |
| 1.025 | 91 | | Junction | | 91_OUT | 1200 | Manhole | 1 STANDARD |
| 36.000 | 92 | 1200 | Manhole | Adoptable | 93 | 1200 | Manhole | Adoptable |
| 36.001 | 93 | 1200 | Manhole | Adoptable | 95 | 1200 | Manhole | Adoptable |
| 37.000 | 94 | 1200 | Manhole | Adoptable | 95 | 1200 | Manhole | Adoptable |
| 36.002 | 95 | 1200 | Manhole | Adoptable | 96 | 1200 | Manhole | Adoptable |
| 36.003 | 96 | 1200 | Manhole | Adoptable | 99 | 1200 | Manhole | Adoptable |
| 38.000 | 97 | 1200 | Manhole | Adoptable | 98 | 1200 | Manhole | Adoptable |
| 38.001 | 98 | 1200 | Manhole | Adoptable | 99 | 1200 | Manhole | Adoptable |
| 36.004 | 99 | 1200 | Manhole | Adoptable | 106 | 2500 | Manhole | Adoptable |
| 39.000 | 100 | | Junction | | 101 | | Junction | |
| 39.001 | 101 | | Junction | | 102 | | Junction | |
| 39.002 | 102 | | Junction | | 103 | | Junction | |
| 39.003 | 103 | | Junction | | 106 | 2500 | Manhole | Adoptable |
| 40.000 | 104 | | Junction | | 105 | 2500 | Manhole | Adoptable |
| 40.001 | 105 | 2500 | Manhole | Adoptable | 106 | 2500 | Manhole | Adoptable |
| 36.005 | 106 | 2500 | Manhole | Adoptable | 107 | 2500 | Manhole | Adoptable |
| 36.006 | 107 | 2500 | Manhole | Adoptable | 110 | 2500 | Manhole | Adoptable |
| 41.000 | 108 | 1200 | Manhole | Adoptable | 109 | 1200 | Manhole | Adoptable |
| 41.001 | 109 | 1200 | Manhole | Adoptable | 110 | 2500 | Manhole | Adoptable |
| 36.007 | 110 | 2500 | Manhole | Adoptable | 111 | | Junction | |
| 42.000 | 121 | 1200 | Manhole | Adoptable | 111 | | Junction | |

## Pipeline Schedule

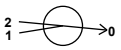
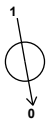
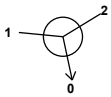
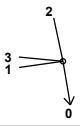
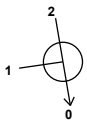
| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 36.008 | 3.937 | 0.0 | 660 | Stormblock | 5.240 | 3.300 | 1.280 | 5.157 | 3.300 | 1.197 |
| 43.001 | 6.336 | 0.0 | 660 | Stormblock Dual | 5.512 | 3.300 | 1.552 | 5.542 | 3.300 | 1.582 |
| 43.002 | 11.278 | 0.0 | 660 | Stormblock Dual | 5.542 | 3.300 | 1.582 | 5.157 | 3.300 | 1.197 |
| 36.009 | 2.420 | 0.0 | 660 | Stormblock | 5.157 | 3.300 | 1.197 | 5.114 | 3.300 | 1.154 |
| 43.000 | 6.205 | 0.0 | 660 | Stormblock Dual | 5.366 | 3.300 | 1.406 | 5.512 | 3.300 | 1.552 |
| 45.000 | 12.142 | 0.0 | 660 | Stormblock | 5.512 | 3.300 | 1.552 | 5.114 | 3.300 | 1.154 |
| 44.000 | 14.153 | 0.0 | 660 | Stormblock | 5.366 | 3.300 | 1.406 | 5.017 | 3.300 | 1.057 |
| 44.001 | 2.331 | 0.0 | 660 | Stormblock | 5.017 | 3.300 | 1.057 | 5.114 | 3.300 | 1.154 |
| 36.010 | 14.685 | 19.6 | 225 | Circular_storm | 5.114 | 3.900 | 0.989 | 4.323 | 3.150 | 0.948 |
| 46.000 | 28.901 | 578.0 | 660 | Stormblock | 4.999 | 2.600 | 1.739 | 4.323 | 2.550 | 1.113 |
| 47.000 | 10.448 | 52.2 | 225 | Circular_storm | 4.780 | 3.350 | 1.205 | 4.323 | 3.150 | 0.948 |
| 36.011 | 3.545 | 70.9 | 300 | Circular_storm | 4.323 | 3.100 | 0.923 | 4.639 | 3.050 | 1.289 |
| 48.000 | 11.614 | 232.3 | 660 | Stormblock | 4.321 | 2.550 | 1.111 | 4.639 | 2.500 | 1.479 |
| 36.012 | 4.048 | 81.0 | 300 | Circular_storm | 4.639 | 3.050 | 1.289 | 4.581 | 3.000 | 1.281 |
| 49.000 | 10.665 | 213.3 | 660 | Stormblock | 4.200 | 2.550 | 0.990 | 4.581 | 2.500 | 1.421 |
| 36.013 | 3.267 | 65.3 | 300 | Circular_storm | 4.581 | 3.000 | 1.281 | 4.450 | 2.950 | 1.200 |
| 50.000 | 10.106 | 202.1 | 660 | Stormblock | 4.000 | 2.500 | 0.840 | 4.450 | 2.450 | 1.340 |
| 36.014 | 4.005 | 80.1 | 300 | Circular_storm | 4.450 | 2.950 | 1.200 | 4.394 | 2.900 | 1.194 |
| 51.000 | 17.261 | 345.2 | 660 | Stormblock | 4.520 | 2.450 | 1.410 | 4.394 | 2.400 | 1.334 |
| 36.015 | 4.554 | 91.1 | 300 | Circular_storm | 4.394 | 2.900 | 1.194 | 4.000 | 2.850 | 0.850 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 36.008 | 111 | | Junction | | 115 | | Junction | |
| 43.001 | 113 | | Junction | | 114 | | Junction | |
| 43.002 | 114 | | Junction | | 115 | | Junction | |
| 36.009 | 115 | | Junction | | 119 | 1800 | Manhole | 1 STANDARD |
| 43.000 | 112 | | Junction | | 113 | | Junction | |
| 45.000 | 113 | | Junction | | 119 | 1800 | Manhole | 1 STANDARD |
| 44.000 | 112 | | Junction | | 117 | | Junction | |
| 44.001 | 117 | | Junction | | 119 | 1800 | Manhole | 1 STANDARD |
| 36.010 | 119 | 1800 | Manhole | 1 STANDARD | 123 | | Junction | |
| 46.000 | 120 | | Junction | | 123 | | Junction | |
| 47.000 | 122 | 1200 | Manhole | Adoptable | 123 | | Junction | |
| 36.011 | 123 | | Junction | | 125 | 1800 | Manhole | Adoptable |
| 48.000 | 124 | | Junction | | 125 | 1800 | Manhole | Adoptable |
| 36.012 | 125 | 1800 | Manhole | Adoptable | 127 | | Junction | |
| 49.000 | 126 | | Junction | | 127 | | Junction | |
| 36.013 | 127 | | Junction | | 129 | 1800 | Manhole | 1 STANDARD |
| 50.000 | 128 | | Junction | | 129 | 1800 | Manhole | 1 STANDARD |
| 36.014 | 129 | 1800 | Manhole | 1 STANDARD | 131 | 1800 | Manhole | Adoptable |
| 51.000 | 130 | | Junction | | 131 | 1800 | Manhole | Adoptable |
| 36.015 | 131 | 1800 | Manhole | Adoptable | 131_OUT | 1200 | Manhole | Adoptable |

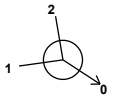
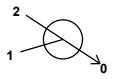
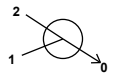
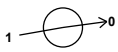
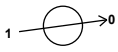
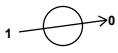
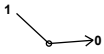
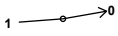
## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 536240.781 | 725277.533 | 13.594 | 1.564 | 1200 |  | 0 1.000 | 12.030 | 225 |
| 2 | 536251.452 | 725221.521 | 12.590 | 1.740 | 1200 |  | 1 1.000<br>0 1.001 | 10.850<br>10.850 | 225<br>225 |
| 3 | 536230.224 | 725218.076 | 12.549 | 1.574 | 1200 |  | 0 3.000 | 10.975 | 225 |
| 4 | 536244.758 | 725216.688 | 12.412 | 1.537 | 1200 |  | 1 3.000<br>0 3.001 | 10.875<br>10.875 | 225<br>225 |
| 5 | 536226.827 | 725215.398 | 12.445 | 0.545 | |  | 0 2.000 | 11.900 | 500 |
| 6 | 536246.541 | 725213.371 | 12.274 | 1.474 | 5200 |  | 1 3.001<br>2 2.000<br>3 1.001<br>0 1.002 | 10.800<br>11.750<br>10.800<br>10.800 | 225<br>500<br>225<br>225 |
| 7 | 536223.821 | 725206.055 | 11.944 | 1.444 | |  | 0 4.000 | 10.500 | 660 |
| 8 | 536249.592 | 725204.621 | 11.822 | 1.372 | 2500 |  | 1 4.000<br>2 1.002<br>0 1.003 | 10.450<br>10.750<br>11.000 | 660<br>225<br>225 |
| 9 | 536223.595 | 725201.354 | 11.673 | 1.323 | |  | 0 5.000 | 10.350 | 660 |
| 10 | 536251.678 | 725200.225 | 11.600 | 1.300 | 2500 |  | 1 5.000<br>2 1.003<br>0 1.004 | 10.300<br>10.900<br>10.900 | 660<br>225<br>225 |
| 11 | 536238.229 | 725194.981 | 11.180 | 1.136 | |  | 0 6.000 | 10.044 | 660 |
| 12 | 536261.912 | 725198.871 | 11.495 | 1.475 | 2500 |  | 1 6.000<br>2 1.004<br>0 1.005 | 10.020<br>10.650<br>10.650 | 660<br>225<br>225 |
| 13 | 536251.481 | 725192.097 | 10.907 | 1.287 | |  | 0 7.000 | 9.620 | 660 |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 14 | 536281.816 | 725197.008 | 11.033 | 1.433 | 2500 | 1 | 7.000 | 9.600 | 660 |
| | | | | | |  2 | 1.005 | 10.200 | 225 |
| | | | | | | 0 | 1.006 | 10.200 | 225 |
| 15 | 536332.069 | 725293.625 | 12.795 | 1.445 | 1200 |  | | | |
| | | | | | | 0 | 8.000 | 11.350 | 225 |
| 16 | 536298.660 | 725287.321 | 12.938 | 1.811 | 1200 | 1 | 8.000 | 11.127 | 225 |
| | | | | | |  | | | |
| | | | | | | 0 | 8.001 | 11.127 | 225 |
| 17 | 536307.178 | 725239.316 | 11.436 | 1.636 | 1200 |  1 | 8.001 | 9.800 | 225 |
| | | | | | | 0 | 8.002 | 9.800 | 225 |
| 18 | 536311.459 | 725216.054 | 11.147 | 1.790 | 1200 |  1 | 8.002 | 9.600 | 225 |
| | | | | | | 0 | 8.003 | 9.357 | 225 |
| 19 | 536314.066 | 725203.401 | 10.505 | 1.655 | 1200 |  1 | 8.003 | 8.850 | 225 |
| | | | | | | 0 | 8.004 | 8.850 | 225 |
| 20 | 536258.667 | 725202.744 | 11.809 | 1.468 | 1200 |  | | | |
| | | | | | | 0 | 9.000 | 10.341 | 225 |
| 21 | 536305.555 | 725198.207 | 10.534 | 1.734 | 1200 | 1 | 9.000 | 8.865 | 225 |
| | | | | | |  2 | 8.004 | 8.800 | 225 |
| | | | | | | 0 | 8.005 | 8.800 | 225 |
| 22 | 536259.300 | 725188.017 | 10.477 | 1.677 | |  | | | |
| | | | | | | 0 | 10.000 | 8.800 | 660 |
| 23 | 536306.313 | 725194.656 | 10.349 | 1.599 | |  2 | 1 | 10.000 | 8.750 | 660 |
| | | | | | | 3 | 2 | 8.005 | 8.750 | 225 |
| | | | | | | 1 | 3 | 1.006 | 9.300 | 225 |
| | | | | | | | 0 | 1.007 | 9.300 | 225 |
| 24 | 536268.778 | 725185.124 | 10.244 | 1.694 | |  | | | |
| | | | | | | 0 | 11.000 | 8.550 | 660 |
| 25 | 536306.990 | 725190.664 | 10.104 | 1.604 | 2500 | 1 | 11.000 | 8.500 | 660 |
| | | | | | |  2 | 1.007 | 9.100 | 225 |
| | | | | | | 0 | 1.008 | 9.100 | 225 |
| 26 | 536282.140 | 725182.050 | 10.183 | 1.783 | |  | | | |
| | | | | | | 0 | 12.000 | 8.400 | 660 |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 27 | 536307.838 | 725185.669 | 9.798 | 1.498 | 2500 |  | 1 | 12.000 | 8.300 | 660 |
| | | | | | | | 2 | 1.008 | 8.900 | 225 |
| | | | | | | | 0 | 1.009 | 8.900 | 225 |
| 28 | 536296.023 | 725178.342 | 9.776 | 1.476 | |  | 0 | 13.000 | 8.300 | 660 |
| 29 | 536311.920 | 725183.002 | 9.561 | 1.311 | 1800 |  | 1 | 13.000 | 8.250 | 660 |
| | | | | | | | 2 | 1.009 | 8.700 | 225 |
| | | | | | | | 0 | 1.010 | 8.700 | 225 |
| 30 | 536304.757 | 725175.833 | 9.313 | 1.263 | |  | 0 | 14.000 | 8.050 | 660 |
| 31 | 536316.022 | 725180.322 | 9.327 | 1.327 | 1800 |  | 1 | 14.000 | 8.000 | 660 |
| | | | | | | | 2 | 1.010 | 8.500 | 225 |
| | | | | | | | 0 | 1.011 | 8.500 | 225 |
| 32 | 536323.389 | 725175.672 | 8.723 | 1.177 | 1200 |  | 1 | 1.011 | 8.000 | 225 |
| | | | | | | | 0 | 1.012 | 7.546 | 225 |
| 33 | 536368.223 | 725183.514 | 7.525 | 0.875 | 1200 |  | 1 | 1.012 | 6.650 | 225 |
| | | | | | | | 0 | 1.013 | 6.650 | 225 |
| 34 | 536375.244 | 725184.461 | 7.354 | 0.854 | 1200 |  | 1 | 1.013 | 6.500 | 225 |
| | | | | | | | 0 | 1.014 | 6.500 | 225 |
| 35 | 536383.099 | 725185.519 | 7.189 | 0.789 | 1200 |  | 1 | 1.014 | 6.400 | 225 |
| | | | | | | | 0 | 1.015 | 6.400 | 225 |
| 36 | 536313.148 | 725185.858 | 9.700 | 0.550 | |  | 0 | 15.000 | 9.150 | 500 |
| 37 | 536321.369 | 725178.224 | 9.058 | 0.558 | |  | 1 | 15.000 | 8.500 | 500 |
| | | | | | | | 0 | 15.001 | 8.500 | 500 |
| 38 | 536344.728 | 725179.986 | 8.108 | 0.608 | |  | 1 | 15.001 | 7.500 | 500 |
| | | | | | | | 0 | 15.002 | 7.500 | 500 |
| 39 | 536349.381 | 725182.481 | 7.878 | 1.578 | 1200 |  | 0 | 16.000 | 6.300 | 225 |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 40 | 536384.813 | 725189.248 | 7.234 | 1.234 | 1200 | 1 | 16.000 | 6.000 | 225 |
| | | | | | | 0 | 16.001 | 6.000 | 225 |
| 41 | 536385.562 | 725187.135 | 7.270 | 1.320 | 5200 | 1 | 16.001 | 5.950 | 225 |
| | | | | | | 2 | 15.002 | 6.750 | 500 |
| | | | | | | 0 | 15.003 | 5.950 | 225 |
| 42 | 536382.945 | 725237.812 | 9.588 | 2.288 | 1200 | 0 | 17.000 | 7.300 | 225 |
| 43 | 536390.451 | 725196.121 | 7.354 | 1.451 | 1200 | 1 | 17.000 | 5.903 | 225 |
| | | | | | | 0 | 17.001 | 5.903 | 225 |
| 44 | 536369.594 | 725175.103 | 6.991 | 1.591 | | 0 | 18.000 | 5.400 | 660 |
| 45 | 536389.076 | 725186.324 | 7.212 | 1.912 | 2500 | 1 | 18.000 | 5.300 | 660 |
| | | | | | | 2 | 17.001 | 5.800 | 225 |
| | | | | | | 3 | 15.003 | 5.900 | 225 |
| | | | | | | 4 | 1.015 | 6.250 | 225 |
| | | | | | | 0 | 1.016 | 5.850 | 300 |
| 46 | 536389.634 | 725182.672 | 6.879 | 1.079 | 1500 | 1 | 1.016 | 5.800 | 300 |
| | | | | | | 0 | 1.017 | 5.800 | 300 |
| 47 | 536379.953 | 725175.225 | 6.533 | 1.283 | | 0 | 19.000 | 5.250 | 660 |
| 48 | 536400.564 | 725183.000 | 6.756 | 1.556 | 1800 | 1 | 19.000 | 5.200 | 660 |
| | | | | | | 2 | 1.017 | 5.700 | 300 |
| | | | | | | 0 | 1.018 | 5.700 | 300 |
| 49 | 536391.775 | 725175.549 | 6.078 | 1.328 | | 0 | 20.000 | 4.750 | 660 |
| 50 | 536401.995 | 725180.052 | 6.236 | 1.536 | 1800 | 1 | 20.000 | 4.700 | 660 |
| | | | | | | 2 | 1.018 | 5.300 | 300 |
| | | | | | | 0 | 1.019 | 5.300 | 300 |
| 51 | 536401.690 | 725175.655 | 5.587 | 1.287 | 2500 | 1 | 1.019 | 4.800 | 300 |
| | | | | | | 0 | 1.020 | 4.300 | 660 |
| 52 | 536402.768 | 725184.960 | 6.929 | 0.629 | | 0 | 30.000 | 6.300 | 500 |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 53 | 536441.161 | 725192.140 | 5.890 | 0.940 | 5200 | 1 | 30.000 | 5.350 | 500 |
| | | | | | | 0 | 30.001 | 4.950 | 225 |
| 55 | 536336.952 | 725294.298 | 12.776 | 1.476 | 1200 | 0 | 21.000 | 11.300 | 225 |
| 56 | 536371.345 | 725300.597 | 11.839 | 1.439 | 1200 | 1 | 21.000 | 10.400 | 225 |
| | | | | | | 0 | 21.001 | 10.400 | 225 |
| 57 | 536377.005 | 725269.187 | 10.330 | 1.230 | 1200 | 1 | 21.001 | 9.100 | 225 |
| | | | | | | 0 | 21.002 | 9.100 | 225 |
| 58 | 536385.780 | 725267.001 | 10.227 | 1.227 | 1200 | 1 | 21.002 | 9.000 | 225 |
| | | | | | | 0 | 21.003 | 9.000 | 225 |
| 59 | 536399.536 | 725272.865 | 10.005 | 1.555 | | 0 | 22.000 | 8.450 | 660 |
| 60 | 536386.779 | 725263.053 | 10.055 | 1.655 | 1800 | 1 | 22.000 | 8.400 | 660 |
| | | | | | | 2 | 21.003 | 8.950 | 225 |
| | | | | | | 0 | 21.004 | 8.950 | 225 |
| 61 | 536388.147 | 725256.689 | 9.759 | 0.959 | 1200 | 1 | 21.004 | 8.800 | 225 |
| | | | | | | 0 | 21.005 | 8.800 | 225 |
| 62 | 536417.891 | 725276.691 | 9.261 | 1.111 | | 0 | 23.000 | 8.150 | 660 |
| 63 | 536390.005 | 725247.920 | 9.484 | 1.384 | 1800 | 1 | 23.000 | 8.100 | 660 |
| | | | | | | 2 | 21.005 | 8.600 | 225 |
| | | | | | | 0 | 21.006 | 8.600 | 225 |
| 64 | 536395.750 | 725248.657 | 9.296 | 1.146 | 1200 | 1 | 21.006 | 8.150 | 225 |
| | | | | | | 0 | 21.007 | 8.150 | 225 |
| 65 | 536428.146 | 725311.395 | 9.590 | 1.590 | 1200 | 0 | 24.000 | 8.000 | 225 |
| 66 | 536434.211 | 725278.249 | 8.457 | 1.157 | 1200 | 1 | 24.000 | 7.300 | 225 |
| | | | | | | 0 | 24.001 | 7.300 | 225 |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 67 | 536431.032 | 725276.683 | 8.521 | 1.271 | 1800 | 1 | 24.001 | 7.270 | 225 |
| | | | | | | 0 | 24.002 | 7.250 | 660 |
| 68 | 536405.595 | 725249.430 | 8.948 | 1.748 | 1800 | 1 | 24.002 | 7.200 | 660 |
| | | | | | | 2 | 21.007 | 7.800 | 225 |
| | | | | | | 0 | 21.008 | 7.800 | 225 |
| 69 | 536432.912 | 725265.332 | 8.063 | 1.363 | | 0 | 25.000 | 6.700 | 660 |
| 70 | 536425.471 | 725253.245 | 8.322 | 1.722 | 2500 | 1 | 25.000 | 6.600 | 660 |
| | | | | | | 2 | 21.008 | 7.550 | 225 |
| | | | | | | 0 | 21.009 | 7.200 | 225 |
| 71 | 536316.759 | 725236.396 | 11.407 | 2.623 | 1200 | 0 | 26.000 | 8.784 | 225 |
| 72 | 536377.792 | 725265.692 | 10.173 | 1.773 | 1200 | 0 | 27.000 | 8.400 | 225 |
| 73 | 536380.783 | 725248.405 | 9.743 | 1.475 | 1200 | 1 | 27.000 | 8.268 | 225 |
| | | | | | | 2 | 26.000 | 8.268 | 225 |
| | | | | | | 0 | 26.001 | 8.268 | 225 |
| 74 | 536389.681 | 725240.724 | 9.341 | 1.746 | 1350 | 1 | 26.001 | 7.595 | 225 |
| | | | | | | 0 | 26.002 | 7.595 | 225 |
| 75 | 536426.963 | 725247.588 | 8.233 | 1.433 | 1200 | 1 | 26.002 | 6.808 | 225 |
| | | | | | | 2 | 21.009 | 6.800 | 225 |
| | | | | | | 0 | 21.010 | 6.808 | 225 |
| 76 | 536435.140 | 725274.423 | 8.268 | 1.768 | 1350 | 0 | 28.000 | 6.500 | 225 |
| 77 | 536439.221 | 725249.719 | 7.569 | 1.769 | 1350 | 1 | 28.000 | 6.144 | 225 |
| | | | | | | 2 | 21.010 | 6.144 | 225 |
| | | | | | | 0 | 21.011 | 5.800 | 225 |
| 78 | 536404.031 | 725187.191 | 7.041 | 1.441 | 1200 | 0 | 29.000 | 5.600 | 225 |
| 79 | 536443.070 | 725194.504 | 5.932 | 1.382 | 1200 | 1 | 29.000 | 4.550 | 225 |
| | | | | | | 2 | 21.012 | 4.550 | 300 |
| | | | | | | 0 | 21.013 | 4.550 | 300 |

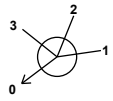
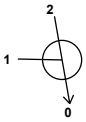
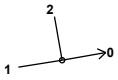
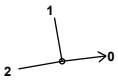
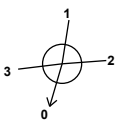
## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 80 | 536448.720 | 725198.255 | 5.797 | 1.197 | 1200 | 1 | 21.011 | 4.600 | 225 |
| | | | | | | 0 | 21.012 | 4.600 | 300 |
| 81 | 536444.370 | 725188.566 | 5.444 | 1.194 | 2500 | 1 | 30.001 | 4.850 | 225 |
| | | | | | | 2 | 21.013 | 4.500 | 300 |
| | | | | | | 3 | 1.020 | 4.250 | 660 |
| | | | | | | 0 | 1.021 | 4.420 | 375 |
| 82 | 536417.498 | 725176.974 | 4.993 | 1.293 | | 0 | 31.000 | 3.700 | 660 |
| 83 | 536456.010 | 725189.508 | 5.375 | 1.695 | 2500 | 1 | 31.000 | 3.680 | 660 |
| | | | | | | 2 | 1.021 | 4.300 | 375 |
| | | | | | | 0 | 1.022 | 3.680 | 660 |
| 84 | 536456.444 | 725192.565 | 5.585 | 1.185 | | 0 | 32.000 | 4.400 | 225 |
| 85 | 536495.594 | 725200.000 | 5.423 | 1.273 | 1200 | 0 | 33.000 | 4.150 | 225 |
| 86 | 536487.321 | 725198.433 | 5.358 | 1.258 | 1200 | 1 | 33.000 | 4.100 | 225 |
| | | | | | | 2 | 32.000 | 4.100 | 225 |
| | | | | | | 0 | 32.001 | 4.100 | 225 |
| 87 | 536487.779 | 725195.674 | 5.253 | 1.603 | 1800 | 1 | 32.001 | 4.050 | 225 |
| | | | | | | 2 | 1.022 | 3.650 | 660 |
| | | | | | | 0 | 1.023 | 3.650 | 660 |
| 88 | 536456.861 | 725186.394 | 4.967 | 1.267 | | 0 | 34.000 | 3.700 | 660 |
| 89 | 536488.262 | 725193.306 | 5.037 | 1.407 | | 1 | 34.000 | 3.630 | 660 |
| | | | | | | 2 | 1.023 | 3.630 | 660 |
| | | | | | | 0 | 1.024 | 3.630 | 660 |
| 90 | 536436.321 | 725180.431 | 4.809 | 1.159 | | 0 | 35.000 | 3.650 | 660 |
| 91 | 536488.961 | 725190.493 | 4.787 | 1.187 | | 1 | 35.000 | 3.600 | 660 |
| | | | | | | 2 | 1.024 | 3.600 | 660 |
| | | | | | | 0 | 1.025 | 4.000 | 300 |
| 91_OUT | 536491.562 | 725191.051 | 4.997 | 1.097 | 1200 | 1 | 1.025 | 3.900 | 300 |

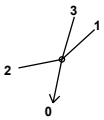
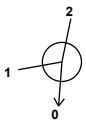
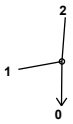
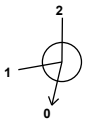
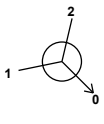
## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 93 | 536483.101 | 725322.110 | 7.974 | 1.574 | 1200 | 1 | 36.000 | 6.400 | 225 |
| | | | | | | 0 | 36.001 | 6.400 | 225 |
| 94 | 536454.976 | 725250.360 | 7.260 | 1.902 | 1200 | 0 | 37.000 | 5.358 | 225 |
| 95 | 536494.944 | 725257.605 | 6.568 | 1.465 | 1200 | 1 | 37.000 | 5.103 | 225 |
| | | | | | | 2 | 36.001 | 5.103 | 225 |
| | | | | | | 0 | 36.002 | 5.103 | 225 |
| 96 | 536537.820 | 725265.377 | 5.596 | 1.496 | 1200 | 1 | 36.002 | 4.100 | 225 |
| | | | | | | 0 | 36.003 | 4.100 | 225 |
| 97 | 536534.101 | 725335.043 | 6.754 | 1.425 | 1200 | 0 | 38.000 | 5.329 | 225 |
| 98 | 536542.714 | 725335.990 | 6.485 | 1.683 | 1200 | 1 | 38.000 | 5.060 | 225 |
| | | | | | | 0 | 38.001 | 4.802 | 225 |
| 99 | 536552.631 | 725269.672 | 5.480 | 1.480 | 1200 | 1 | 38.001 | 4.200 | 225 |
| | | | | | | 2 | 36.003 | 4.000 | 225 |
| | | | | | | 0 | 36.004 | 4.000 | 225 |
| 100 | 536546.680 | 725336.287 | 6.473 | 0.573 | | 0 | 39.000 | 5.900 | 500 |
| 101 | 536552.697 | 725304.124 | 6.006 | 0.506 | | 1 | 39.000 | 5.500 | 500 |
| | | | | | | 0 | 39.001 | 5.500 | 500 |
| 102 | 536552.984 | 725296.634 | 5.949 | 0.549 | | 1 | 39.001 | 5.400 | 500 |
| | | | | | | 0 | 39.002 | 5.400 | 500 |
| 103 | 536557.319 | 725270.610 | 5.398 | 0.948 | | 1 | 39.002 | 4.850 | 500 |
| | | | | | | 0 | 39.003 | 4.450 | 225 |
| 104 | 536560.127 | 725282.008 | 5.153 | 1.603 | | 0 | 40.000 | 3.550 | 660 |
| 105 | 536562.692 | 725268.058 | 4.767 | 1.267 | 2500 | 1 | 40.000 | 3.500 | 660 |
| | | | | | | 0 | 40.001 | 3.500 | 660 |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 106 | 536555.892 | 725267.078 | 5.551 | 2.101 | 2500 |  | 1 | 40.001 | 3.450 | 660 |
| | | | | | | | 2 | 39.003 | 4.400 | 225 |
| | | | | | | | 3 | 36.004 | 3.950 | 225 |
| | | | | | | | 0 | 36.005 | 3.950 | 300 |
| 107 | 536546.212 | 725259.788 | 5.589 | 2.189 | 2500 |  | 1 | 36.005 | 3.900 | 300 |
| | | | | | | | 0 | 36.006 | 3.400 | 660 |
| 108 | 536540.788 | 725251.082 | 5.438 | 1.425 | 1200 |  | 0 | 41.000 | 4.013 | 225 |
| 109 | 536542.497 | 725240.740 | 5.356 | 1.456 | 1200 |  | 1 | 41.000 | 3.900 | 225 |
| | | | | | | | 0 | 41.001 | 3.900 | 225 |
| 110 | 536549.570 | 725240.595 | 5.506 | 2.156 | 2500 |  | 1 | 41.001 | 3.800 | 225 |
| | | | | | | | 2 | 36.006 | 3.350 | 660 |
| | | | | | | | 0 | 36.007 | 3.350 | 660 |
| 111 | 536551.521 | 725229.487 | 5.240 | 1.940 | |  | 1 | 42.000 | 3.700 | 225 |
| | | | | | | | 2 | 36.007 | 3.300 | 660 |
| | | | | | | | 0 | 36.008 | 3.300 | 660 |
| 112 | 536565.770 | 725243.611 | 5.366 | 2.066 | |  | 0-1 | 43.000 | 3.300 | 660 |
| | | | | | | | 0-2 | 44.000 | 3.300 | 660 |
| 113 | 536559.673 | 725242.456 | 5.512 | 2.212 | |  | 1 | 43.000 | 3.300 | 660 |
| | | | | | | | 0-1 | 43.001 | 3.300 | 660 |
| | | | | | | | 0-2 | 45.000 | 3.300 | 660 |
| 114 | 536553.448 | 725241.276 | 5.542 | 2.242 | |  | 1 | 43.001 | 3.300 | 660 |
| | | | | | | | 0 | 43.002 | 3.300 | 660 |
| 115 | 536555.399 | 725230.168 | 5.157 | 1.857 | |  | 1 | 43.002 | 3.300 | 660 |
| | | | | | | | 2 | 36.008 | 3.300 | 660 |
| | | | | | | | 0 | 36.009 | 3.300 | 660 |
| 117 | 536560.126 | 725230.632 | 5.017 | 1.717 | |  | 1 | 44.000 | 3.300 | 660 |
| | | | | | | | 0 | 44.001 | 3.300 | 660 |
| 119 | 536557.801 | 725230.459 | 5.114 | 1.814 | 1800 |  | 1 | 45.000 | 3.300 | 660 |
| | | | | | | | 2 | 44.001 | 3.300 | 660 |
| | | | | | | | 3 | 36.009 | 3.300 | 660 |
| | | | | | | | 0 | 36.010 | 3.900 | 225 |
| 120 | 536525.326 | 725210.777 | 4.999 | 2.399 | |  | 0 | 46.000 | 2.600 | 660 |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 121 | 536545.615 | 725228.548 | 5.274 | 1.474 | 1200 |  | | | |
| | | | | | | 0 | 42.000 | 3.800 | 225 |
| 122 | 536561.398 | 725223.407 | 4.780 | 1.430 | 1200 |  | | | |
| | | | | | | 0 | 47.000 | 3.350 | 225 |
| 123 | 536553.682 | 725216.363 | 4.323 | 1.773 | |  | | | |
| | | | | | | 1 | 47.000 | 3.150 | 225 |
| | | | | | | 2 | 46.000 | 2.550 | 660 |
| | | | | | | 3 | 36.010 | 3.150 | 225 |
| | | | | | | 0 | 36.011 | 3.100 | 300 |
| 124 | 536541.536 | 725210.847 | 4.321 | 1.771 | |  | | | |
| | | | | | | 0 | 48.000 | 2.550 | 660 |
| 125 | 536552.969 | 725212.890 | 4.639 | 2.139 | 1800 |  | | | |
| | | | | | | 1 | 48.000 | 2.500 | 660 |
| | | | | | | 2 | 36.011 | 3.050 | 300 |
| | | | | | | 0 | 36.012 | 3.050 | 300 |
| 126 | 536542.168 | 725206.954 | 4.200 | 1.650 | |  | | | |
| | | | | | | 0 | 49.000 | 2.550 | 660 |
| 127 | 536552.662 | 725208.854 | 4.581 | 2.081 | |  | | | |
| | | | | | | 1 | 49.000 | 2.500 | 660 |
| | | | | | | 2 | 36.012 | 3.000 | 300 |
| | | | | | | 0 | 36.013 | 3.000 | 300 |
| 128 | 536542.676 | 725203.831 | 4.000 | 1.500 | |  | | | |
| | | | | | | 0 | 50.000 | 2.500 | 660 |
| 129 | 536552.628 | 725205.587 | 4.450 | 2.000 | 1800 |  | | | |
| | | | | | | 1 | 50.000 | 2.450 | 660 |
| | | | | | | 2 | 36.013 | 2.950 | 300 |
| | | | | | | 0 | 36.014 | 2.950 | 300 |
| 130 | 536534.802 | 725198.224 | 4.520 | 2.070 | |  | | | |
| | | | | | | 0 | 51.000 | 2.450 | 660 |
| 131 | 536551.712 | 725201.688 | 4.394 | 1.994 | 1800 |  | | | |
| | | | | | | 1 | 51.000 | 2.400 | 660 |
| | | | | | | 2 | 36.014 | 2.900 | 300 |
| | | | | | | 0 | 36.015 | 2.900 | 300 |
| 131_OUT | 536554.935 | 725198.471 | 4.000 | 1.150 | 1200 |  | | | |
| | | | | | | 1 | 36.015 | 2.850 | 300 |
| 92 | 536474.579 | 725320.795 | 8.071 | 1.471 | 1200 |  | | | |
| | | | | | | 0 | 36.000 | 6.600 | 225 |

## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Analysis Speed | Normal |
| FSR Region | Scotland and Ireland | Skip Steady State | x |
| M5-60 (mm) | 14.600 | Drain Down Time (mins) | 960 |
| Ratio-R | 0.245 | Additional Storage (m³/ha) | 20.0 |
| Summer CV | 0.750 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |

### Storm Durations

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | 60 | 180 | 360 | 600 | 960 | 2160 | 4320 |
| 30 | 120 | 240 | 480 | 720 | 1440 | 2880 | |

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 1 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 |
| 100 | 30 | 0 | 0 |

## Node 101 Online Weir Control

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 5.500 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

## Node 102 Online Weir Control

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 5.400 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

## Node 103 Online Weir Control

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 4.450 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

## Node 91_OUT Online Pump Control

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 3.900 | Switch off depth (m) | 0.000 |
| Replaces Downstream Link | ✓ | Switch on depth (m) | 1.000 | | |

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|
| 0.010 | 0.000 | 1.000 | 0.000 |

## Node 131_OUT Online Pump Control

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 2.850 | Switch off depth (m) | 0.000 |
| Replaces Downstream Link | ✓ | Switch on depth (m) | 1.000 | | |

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|
| 0.010 | 0.000 | 1.000 | 0.000 |

## Node 36 Online Weir Control

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 9.150 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

**Node 37 Online Weir Control**

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 8.500 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

**Node 38 Online Weir Control**

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 7.500 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

**Node 41 Online Weir Control**

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 5.950 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

**Node 53 Online Weir Control**

| | | | | | |
|---|---|---|---|---|---|
| Flap Valve | x | Invert Level (m) | 4.950 | Discharge Coefficient | 0.590 |
| Replaces Downstream Link | ✓ | Width (m) | 0.100 | | |

**Node 81 Online Hydro-Brake® Control**

| | | | |
|---|---|---|---|
| Flap Valve | x | Objective | (HE) Minimise upstream storage |
| Replaces Downstream Link | x | Sump Available | ✓ |
| Invert Level (m) | 4.420 | Product Number | CTL-SHE-0146-1000-1000-1000 |
| Design Depth (m) | 1.000 | Min Outlet Diameter (m) | 0.225 |
| Design Flow (l/s) | 10.0 | Min Node Diameter (mm) | 1200 |

**Node 31 Online Hydro-Brake® Control**

| | | | |
|---|---|---|---|
| Flap Valve | x | Objective | (HE) Minimise upstream storage |
| Replaces Downstream Link | x | Sump Available | ✓ |
| Invert Level (m) | 8.500 | Product Number | CTL-SHE-0047-1000-1000-1000 |
| Design Depth (m) | 1.000 | Min Outlet Diameter (m) | 0.075 |
| Design Flow (l/s) | 1.0 | Min Node Diameter (mm) | 1200 |

**Node 23 Online Hydro-Brake® Control**

| | | | |
|---|---|---|---|
| Flap Valve | x | Objective | (HE) Minimise upstream storage |
| Replaces Downstream Link | ✓ | Sump Available | ✓ |
| Invert Level (m) | 9.300 | Product Number | CTL-SHE-0067-2000-1000-2000 |
| Design Depth (m) | 1.000 | Min Outlet Diameter (m) | 0.100 |
| Design Flow (l/s) | 2.0 | Min Node Diameter (mm) | 1200 |

**Node 46 Online Hydro-Brake® Control**

| | | | |
|---|---|---|---|
| Flap Valve | x | Objective | (HE) Minimise upstream storage |
| Replaces Downstream Link | x | Sump Available | ✓ |
| Invert Level (m) | 5.800 | Product Number | CTL-SHE-0058-1500-1000-1500 |
| Design Depth (m) | 1.000 | Min Outlet Diameter (m) | 0.075 |
| Design Flow (l/s) | 1.5 | Min Node Diameter (mm) | 1200 |

## Node 75 Online Hydro-Brake® Control

| | | | |
|---|---|---|---|
| Flap Valve | x | Objective | (HE) Minimise upstream storage |
| Replaces Downstream Link | x | Sump Available | ✓ |
| Invert Level (m) | 6.808 | Product Number | CTL-SHE-0115-6000-1000-6000 |
| Design Depth (m) | 1.000 | Min Outlet Diameter (m) | 0.150 |
| Design Flow (l/s) | 6.0 | Min Node Diameter (mm) | 1200 |

## Node 123 Online Hydro-Brake® Control

| | | | |
|---|---|---|---|
| Flap Valve | x | Objective | (HE) Minimise upstream storage |
| Replaces Downstream Link | x | Sump Available | ✓ |
| Invert Level (m) | 3.100 | Product Number | CTL-SHE-0098-5000-1500-5000 |
| Design Depth (m) | 1.500 | Min Outlet Diameter (m) | 0.150 |
| Design Flow (l/s) | 5.0 | Min Node Diameter (mm) | 1200 |

## Node 6 Link Infiltration Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 2.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 11.750 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

## Node 8 Link Infiltration Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 4.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 10.450 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 112 | | |

## Node 10 Link Infiltration Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 5.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 10.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 285 | | |

## Node 12 Link Infiltration Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 6.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 10.020 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

## Node 14 Link Infiltration Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 7.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 9.600 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

## Node 23 Link Infiltration Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 10.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 8.750 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 270 | | |

## Node 25 Link Infiltration Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 11.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 8.500 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 27 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 12.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 8.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 31 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 14.000 |
| Side Inf Coefficient (m/hr) | 0.07990 | Invert Level (m) | 8.000 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 29 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 13.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 8.250 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 41 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 15.002 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 6.750 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 45 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 18.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 5.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 645 | | |

**Node 48 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 19.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 5.200 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 50 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 20.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 4.700 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 870 | | |

**Node 50 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 20.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 4.700 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 870 | | |

**Node 53 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 30.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 5.350 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 81 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 1.020 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 4.250 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 600 | | |

**Node 83 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 31.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 3.680 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 1860 | | |

**Node 91 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 35.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 3.600 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | | | |

**Node 87 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 1.022 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 3.650 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 1560 | | |

**Node 89 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 34.000 |
| Side Inf Coefficient (m/hr) | 0.03470 | Invert Level (m) | 3.630 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 1980 | | |

**Node 105 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 40.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.500 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 20 | | |

**Node 106 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 40.001 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.450 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 29 | | |

**Node 110 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 36.006 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.350 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 111 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 36.007 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 32 | | |

**Node 115 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 36.008 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 64 | | |

**Node 115 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 43.002 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 64 | | |

**Node 114 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 43.001 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 111 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 36.007 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 32 | | |

**Node 119 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 36.009 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 80 | | |

**Node 119 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 44.001 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 104 | | |

**Node 119 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 45.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 80 | | |

**Node 117 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 44.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 104 | | |

**Node 113 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 43.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 3.300 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 123 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 46.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 2.550 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 256 | | |

**Node 125 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 48.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 2.500 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 225 | | |

**Node 127 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 49.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 2.500 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 270 | | |

**Node 129 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 50.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 2.450 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 375 | | |

**Node 131 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 51.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 2.400 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 225 | | |

**Node 101 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 39.000 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 5.500 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 5 | | |

**Node 102 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 39.001 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 5.400 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Node 103 Link Infiltration Storage Structure**

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Link | 39.002 |
| Side Inf Coefficient (m/hr) | 0.14240 | Invert Level (m) | 4.850 | | |
| Safety Factor | 2.0 | Time to half empty (mins) | 0 | | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 1 | 10 | 12.076 | 0.046 | 7.2 | 0.0965 | 0.0000 | OK |
| 15 minute winter | 2 | 11 | 10.925 | 0.075 | 8.4 | 0.0974 | 0.0000 | OK |
| 15 minute summer | 3 | 10 | 11.008 | 0.033 | 1.8 | 0.0447 | 0.0000 | OK |
| 15 minute summer | 4 | 11 | 10.899 | 0.024 | 1.8 | 0.0271 | 0.0000 | OK |
| 15 minute summer | 5 | 1 | 11.900 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 6 | 13 | 10.881 | 0.081 | 11.5 | 1.7419 | 0.0000 | OK |
| 1440 minute winter | 7 | 1020 | 10.875 | 0.375 | 0.4 | 0.0000 | 0.0000 | OK |
| 1440 minute winter | 8 | 1020 | 10.875 | 0.425 | 1.2 | 2.0873 | 0.0000 | OK |
| 15 minute summer | 9 | 1 | 10.350 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 10 | 1 | 10.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 1440 minute winter | 11 | 960 | 10.101 | 0.057 | 0.1 | 0.0070 | 0.0000 | OK |
| 1440 minute winter | 12 | 960 | 10.101 | 0.081 | 0.1 | 0.4099 | 0.0000 | OK |
| 15 minute summer | 13 | 1 | 9.620 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 14 | 1 | 9.600 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 15 | 10 | 11.388 | 0.038 | 2.8 | 0.0586 | 0.0000 | OK |
| 15 minute winter | 16 | 11 | 11.172 | 0.045 | 7.8 | 0.0769 | 0.0000 | OK |
| 15 minute winter | 17 | 11 | 9.872 | 0.072 | 10.3 | 0.1071 | 0.0000 | OK |
| 15 minute winter | 18 | 11 | 9.411 | 0.054 | 13.4 | 0.0837 | 0.0000 | OK |
| 1440 minute winter | 19 | 960 | 9.195 | 0.345 | 1.5 | 0.4381 | 0.0000 | SURCHARGED |
| 15 minute summer | 20 | 1 | 10.341 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 1 | 1.000 | 2 | 7.0 | 0.838 | 0.093 | 0.4976 | |
| 15 minute winter | 2 | 1.001 | 6 | 8.1 | 0.860 | 0.216 | 0.1138 | |
| 15 minute summer | 3 | 3.000 | 4 | 1.8 | 0.616 | 0.041 | 0.0421 | |
| 15 minute summer | 4 | 3.001 | 6 | 1.8 | 0.576 | 0.024 | 0.0263 | |
| 15 minute summer | 5 | 2.000 | 6 | 0.0 | 0.000 | 0.000 | 0.0002 | |
| 15 minute winter | 6 | 1.002 | 8 | 9.5 | 0.771 | 0.250 | 0.1142 | |
| 15 minute winter | 6 | Infiltration | | 0.0 | | | | |
| 1440 minute winter | 7 | 4.000 | 8 | -0.4 | -0.002 | 0.000 | 16.5292 | |
| 1440 minute winter | 8 | 1.003 | 10 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 1440 minute winter | 8 | Infiltration | | 0.5 | | | | |
| 15 minute summer | 9 | 5.000 | 10 | 0.0 | 0.000 | 0.000 | 0.0014 | |
| 15 minute summer | 10 | 1.004 | 12 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 10 | Infiltration | | 0.0 | | | | |
| 1440 minute winter | 11 | 6.000 | 12 | -0.1 | -0.002 | 0.000 | 2.6438 | |
| 1440 minute winter | 12 | 1.005 | 14 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 1440 minute winter | 12 | Infiltration | | 0.1 | | | | |
| 15 minute summer | 13 | 7.000 | 14 | 0.0 | 0.000 | 0.000 | 0.0015 | |
| 15 minute summer | 14 | 1.006 | 23 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 14 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 15 | 8.000 | 16 | 2.7 | 0.534 | 0.064 | 0.1715 | |
| 15 minute winter | 16 | 8.001 | 17 | 7.6 | 0.946 | 0.088 | 0.4047 | |
| 15 minute winter | 17 | 8.002 | 18 | 10.1 | 0.942 | 0.211 | 0.2535 | |
| 15 minute winter | 18 | 8.003 | 19 | 13.4 | 1.087 | 0.129 | 0.1614 | |
| 1440 minute winter | 19 | 8.004 | 21 | 1.5 | 0.283 | 0.040 | 0.3966 | |
| 15 minute summer | 20 | 9.000 | 21 | 0.0 | 0.000 | 0.000 | 0.0425 | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | 21 | 960 | 9.195 | 0.395 | 2.4 | 0.5778 | 0.0000 | SURCHARGED |
| 1440 minute winter | 22 | 960 | 9.195 | 0.395 | 0.7 | 0.0000 | 0.0000 | OK |
| 1440 minute winter | 23 | 960 | 9.195 | 0.445 | 2.3 | 0.1837 | 0.0000 | OK |
| 15 minute summer | 24 | 1 | 8.550 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 25 | 1 | 8.500 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 2160 minute winter | 26 | 1440 | 8.400 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 2880 minute winter | 27 | 1740 | 8.399 | 0.099 | 0.1 | 0.5001 | 0.0000 | OK |
| 15 minute summer | 28 | 1 | 8.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 29 | 1 | 8.250 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 30 | 1 | 8.050 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 31 | 1 | 8.000 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 32 | 1 | 7.546 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 33 | 1 | 6.650 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 34 | 1 | 6.500 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 35 | 1 | 6.400 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 36 | 10 | 9.188 | 0.038 | 1.4 | 0.0202 | 0.0000 | OK |
| 15 minute winter | 37 | 10 | 8.576 | 0.076 | 4.0 | 0.0729 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | 21 | 8.005 | 23 | 2.2 | 0.476 | 0.035 | 0.1444 | |
| 1440 minute winter | 22 | 10.000 | 23 | -0.7 | -0.003 | -0.001 | 31.8850 | |
| 1440 minute winter | 23 | Hydro-Brake® | 25 | 0.0 | | | | |
| 1440 minute winter | 23 | Infiltration | | 0.9 | | | | |
| 15 minute summer | 24 | 11.000 | 25 | 0.0 | 0.000 | 0.000 | 0.0019 | |
| 15 minute summer | 25 | 1.008 | 27 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 25 | Infiltration | | 0.0 | | | | |
| 2160 minute winter | 26 | 12.000 | 27 | 0.0 | 0.000 | 0.000 | 2.0517 | |
| 2880 minute winter | 27 | 1.009 | 29 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 2880 minute winter | 27 | Infiltration | | 0.1 | | | | |
| 15 minute summer | 28 | 13.000 | 29 | 0.0 | 0.000 | 0.000 | 0.0004 | |
| 15 minute summer | 29 | 1.010 | 31 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 29 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 30 | 14.000 | 31 | 0.0 | 0.000 | 0.000 | 0.0003 | |
| 15 minute summer | 31 | 1.011 | 32 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 31 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 32 | 1.012 | 33 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 33 | 1.013 | 34 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 34 | 1.014 | 35 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 35 | 1.015 | 45 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute winter | 36 | Weir | 37 | 1.4 | | | | |
| 15 minute winter | 37 | Weir | 38 | 3.9 | | | | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 38 | 10 | 7.608 | 0.108 | 6.6 | 0.0992 | 0.0000 | OK |
| 15 minute summer | 39 | 1 | 6.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 30 minute winter | 40 | 22 | 6.026 | 0.026 | 0.4 | 0.0289 | 0.0000 | OK |
| 30 minute winter | 41 | 22 | 6.025 | 0.075 | 5.5 | 1.6031 | 0.0000 | OK |
| 15 minute winter | 42 | 10 | 7.338 | 0.038 | 6.1 | 0.0642 | 0.0000 | OK |
| 15 minute winter | 43 | 11 | 5.956 | 0.053 | 6.0 | 0.0599 | 0.0000 | OK |
| 960 minute winter | 44 | 585 | 5.925 | 0.525 | 1.9 | 0.0399 | 0.0000 | OK |
| 960 minute winter | 45 | 585 | 5.924 | 0.624 | 3.5 | 3.3242 | 0.0000 | OK |
| 960 minute winter | 46 | 570 | 5.930 | 0.130 | 3.9 | 0.2295 | 0.0000 | OK |
| 960 minute winter | 47 | 675 | 5.711 | 0.461 | 0.6 | 0.0000 | 0.0000 | OK |
| 960 minute winter | 48 | 675 | 5.711 | 0.511 | 1.2 | 1.3009 | 0.0000 | OK |
| 2160 minute winter | 49 | 1620 | 5.240 | 0.490 | 0.3 | 0.0000 | 0.0000 | OK |
| 2160 minute winter | 50 | 1620 | 5.240 | 0.540 | 0.7 | 1.3746 | 0.0000 | OK |
| 240 minute winter | 51 | 156 | 4.554 | 0.254 | 3.0 | 1.2469 | 0.0000 | OK |
| 15 minute summer | 52 | 1 | 6.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 53 | 1 | 4.950 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 55 | 10 | 11.330 | 0.030 | 3.2 | 0.0469 | 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 | 38 | Weir | 41 | 6.5 | | | | |
| 15 minute summer | 39 | 16.000 | 40 | 0.0 | 0.000 | 0.000 | 0.0267 | |
| 30 minute winter | 40 | 16.001 | 41 | -0.4 | -0.082 | -0.005 | 0.0158 | |
| 30 minute winter | 41 | Weir | 45 | 3.8 | | | | |
| 30 minute winter | 41 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 42 | 17.000 | 43 | 6.0 | 1.058 | 0.063 | 0.2428 | |
| 15 minute winter | 43 | 17.001 | 45 | 5.9 | 0.860 | 0.111 | 0.0679 | |
| 960 minute winter | 44 | 18.000 | 45 | 2.4 | 0.003 | 0.001 | 20.6652 | |
| 960 minute winter | 45 | 1.016 | 46 | 3.9 | 0.382 | 0.030 | 0.0782 | |
| 960 minute winter | 45 | Infiltration | | 0.2 | | | | |
| 960 minute winter | 46 | 1.017 | 48 | 1.2 | 0.501 | 0.011 | 0.0262 | |
| 960 minute winter | 47 | 19.000 | 48 | -0.6 | -0.012 | -0.001 | 8.5689 | |
| 960 minute winter | 48 | 1.018 | 50 | 0.9 | 1.143 | 0.002 | 0.0026 | |
| 960 minute winter | 48 | Infiltration | | 0.1 | | | | |
| 2160 minute winter | 49 | 20.000 | 50 | -0.3 | -0.002 | 0.000 | 4.6027 | |
| 2160 minute winter | 50 | 1.019 | 51 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 2160 minute winter | 50 | Infiltration | | 0.1 | | | | |
| 2160 minute winter | 50 | Infiltration | | 0.1 | | | | |
| 240 minute winter | 51 | 1.020 | 81 | -3.0 | -0.026 | -0.003 | 19.9075 | |
| 15 minute summer | 52 | 30.000 | 53 | 0.0 | 0.000 | 0.000 | 0.0004 | |
| 15 minute summer | 53 | Weir | 81 | 0.0 | | | | |
| 15 minute summer | 53 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 55 | 21.000 | 56 | 3.1 | 0.821 | 0.037 | 0.1341 | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 56 | 10 | 10.439 | 0.039 | 7.1 | 0.0664 | 0.0000 | OK |
| 15 minute winter | 57 | 11 | 9.160 | 0.060 | 7.5 | 0.0736 | 0.0000 | OK |
| 15 minute winter | 58 | 11 | 9.061 | 0.061 | 7.6 | 0.0690 | 0.0000 | OK |
| 360 minute winter | 59 | 216 | 8.971 | 0.521 | 0.7 | 0.0000 | 0.0000 | OK |
| 360 minute winter | 60 | 216 | 8.971 | 0.571 | 1.6 | 1.4524 | 0.0000 | OK |
| 360 minute winter | 61 | 216 | 8.821 | 0.021 | 1.3 | 0.0235 | 0.0000 | OK |
| 4320 minute winter | 62 | 3060 | 8.606 | 0.456 | 0.2 | 0.0000 | 0.0000 | OK |
| 4320 minute winter | 63 | 3060 | 8.606 | 0.506 | 0.4 | 1.2889 | 0.0000 | OK |
| 4320 minute winter | 64 | 3060 | 8.158 | 0.008 | 0.2 | 0.0087 | 0.0000 | OK |
| 15 minute winter | 65 | 10 | 8.041 | 0.041 | 5.6 | 0.0767 | 0.0000 | OK |
| 2880 minute winter | 66 | 1740 | 7.813 | 0.513 | 0.4 | 0.6653 | 0.0000 | SURCHARGED |
| 2880 minute winter | 67 | 1740 | 7.813 | 0.563 | 0.4 | 1.4317 | 0.0000 | OK |
| 2880 minute winter | 68 | 1740 | 7.813 | 0.613 | 0.4 | 1.6533 | 0.0000 | OK |
| 4320 minute winter | 69 | 4680 | 6.986 | 0.286 | 0.1 | 0.0000 | 0.0000 | OK |
| 4320 minute winter | 70 | 4680 | 6.986 | 0.386 | 0.3 | 1.8932 | 0.0000 | OK |
| 15 minute winter | 71 | 11 | 8.844 | 0.060 | 6.6 | 0.0986 | 0.0000 | OK |
| 15 minute winter | 72 | 10 | 8.432 | 0.032 | 2.0 | 0.0429 | 0.0000 | OK |
| 15 minute winter | 73 | 11 | 8.311 | 0.043 | 9.8 | 0.0574 | 0.0000 | OK |
| 15 minute winter | 74 | 11 | 7.653 | 0.058 | 11.0 | 0.0917 | 0.0000 | OK |
| 15 minute summer | 75 | 16 | 7.299 | 0.499 | 13.6 | 0.8063 | 0.0000 | SURCHARGED |
| 15 minute winter | 76 | 11 | 6.516 | 0.016 | 0.7 | 0.0244 | 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 | 56 | 21.001 | 57 | 6.9 | 1.096 | 0.066 | 0.2067 | |
| 15 minute winter | 57 | 21.002 | 58 | 7.6 | 0.888 | 0.139 | 0.0772 | |
| 15 minute winter | 58 | 21.003 | 60 | 7.6 | 0.940 | 0.132 | 0.0329 | |
| 360 minute winter | 59 | 22.000 | 60 | -0.7 | -0.007 | -0.001 | 7.0264 | |
| 360 minute winter | 60 | 21.004 | 61 | 1.3 | 0.726 | 0.017 | 0.0118 | |
| 360 minute winter | 61 | 21.005 | 63 | 1.3 | 0.732 | 0.017 | 0.0161 | |
| 4320 minute winter | 62 | 23.000 | 63 | -0.2 | -0.010 | 0.000 | 15.4348 | |
| 4320 minute winter | 63 | 21.006 | 64 | 0.2 | 0.560 | 0.001 | 0.0021 | |
| 4320 minute winter | 64 | 21.007 | 68 | 0.2 | 0.370 | 0.002 | 0.0059 | |
| 15 minute winter | 65 | 24.000 | 66 | 5.5 | 0.824 | 0.073 | 0.2284 | |
| 2880 minute winter | 66 | 24.001 | 67 | 0.4 | 0.267 | 0.008 | 0.1409 | |
| 2880 minute winter | 67 | 24.002 | 68 | 0.3 | 0.026 | 0.000 | 17.5257 | |
| 2880 minute winter | 68 | 21.008 | 70 | 0.3 | 0.398 | 0.006 | 0.0174 | |
| 4320 minute winter | 69 | 25.000 | 70 | -0.1 | -0.001 | 0.000 | 7.6240 | |
| 4320 minute winter | 70 | 21.009 | 75 | 0.0 | 0.000 | 0.000 | 0.0242 | |
| 15 minute winter | 71 | 26.000 | 73 | 6.4 | 0.954 | 0.139 | 0.4426 | |
| 15 minute winter | 72 | 27.000 | 73 | 1.9 | 0.459 | 0.043 | 0.0746 | |
| 15 minute winter | 73 | 26.001 | 74 | 9.8 | 1.491 | 0.079 | 0.0781 | |
| 15 minute winter | 74 | 26.002 | 75 | 11.0 | 0.464 | 0.147 | 0.9070 | |
| 15 minute summer | 75 | 21.010 | 77 | 6.0 | 1.561 | 0.050 | 0.0477 | |
| 15 minute winter | 76 | 28.000 | 77 | 0.6 | 0.505 | 0.010 | 0.0314 | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 77 | 11 | 5.850 | 0.050 | 8.7 | 0.0844 | 0.0000 | OK |
| 15 minute winter | 78 | 10 | 5.630 | 0.030 | 3.4 | 0.0492 | 0.0000 | OK |
| 15 minute winter | 79 | 11 | 4.644 | 0.094 | 17.9 | 0.1237 | 0.0000 | OK |
| 15 minute winter | 80 | 11 | 4.686 | 0.086 | 13.5 | 0.1731 | 0.0000 | OK |
| 240 minute winter | 81 | 156 | 4.554 | 0.304 | 7.3 | 1.4923 | 0.0000 | OK |
| 2880 minute winter | 82 | 2040 | 3.885 | 0.185 | 0.2 | 0.0242 | 0.0000 | OK |
| 2880 minute winter | 83 | 2040 | 3.885 | 0.205 | 1.4 | 1.0065 | 0.0000 | OK |
| 15 minute winter | 84 | 10 | 4.436 | 0.036 | 2.9 | 0.0182 | 0.0000 | OK |
| 15 minute winter | 85 | 11 | 4.176 | 0.026 | 1.1 | 0.0336 | 0.0000 | OK |
| 15 minute winter | 86 | 11 | 4.140 | 0.040 | 3.9 | 0.0451 | 0.0000 | OK |
| 2880 minute winter | 87 | 2040 | 3.885 | 0.235 | 2.7 | 0.5983 | 0.0000 | OK |
| 2880 minute winter | 88 | 2040 | 3.885 | 0.185 | 0.2 | 0.0000 | 0.0000 | OK |
| 2880 minute winter | 89 | 2040 | 3.885 | 0.255 | 2.5 | 0.0000 | 0.0000 | OK |
| 2880 minute winter | 90 | 2040 | 3.885 | 0.235 | 0.3 | 0.0000 | 0.0000 | OK |
| 2880 minute winter | 91 | 2040 | 3.885 | 0.285 | 3.2 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 91_OUT | 1 | 3.900 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 93 | 10 | 6.457 | 0.057 | 10.6 | 0.1408 | 0.0000 | OK |
| 15 minute winter | 94 | 10 | 5.421 | 0.063 | 7.3 | 0.1218 | 0.0000 | OK |
| 15 minute winter | 95 | 11 | 5.178 | 0.075 | 19.3 | 0.1051 | 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 | 77 | 21.011 | 80 | 8.7 | 0.960 | 0.110 | 0.5372 | |
| 15 minute winter | 78 | 29.000 | 79 | 3.3 | 0.456 | 0.039 | 0.3746 | |
| 15 minute winter | 79 | 21.013 | 81 | 17.7 | 1.010 | 0.176 | 0.1067 | |
| 15 minute winter | 80 | 21.012 | 79 | 13.4 | 0.755 | 0.141 | 0.1206 | |
| 240 minute winter | 81 | 1.021 | 83 | 4.7 | 0.758 | 0.023 | 0.0728 | |
| 240 minute winter | 81 | Infiltration | | 0.2 | | | | |
| 2880 minute winter | 82 | 31.000 | 83 | -0.2 | -0.007 | 0.000 | 12.6399 | |
| 2880 minute winter | 83 | 1.022 | 87 | 1.0 | 0.106 | 0.002 | 5.6982 | |
| 2880 minute winter | 83 | Infiltration | | 0.2 | | | | |
| 15 minute winter | 84 | 32.000 | 86 | 2.8 | 0.650 | 0.056 | 0.1373 | |
| 15 minute winter | 85 | 33.000 | 86 | 1.1 | 0.318 | 0.028 | 0.0304 | |
| 15 minute winter | 86 | 32.001 | 87 | 3.9 | 0.884 | 0.056 | 0.0123 | |
| 2880 minute winter | 87 | 1.023 | 89 | 1.7 | 0.067 | 0.001 | 0.4740 | |
| 2880 minute winter | 87 | Infiltration | | 0.1 | | | | |
| 2880 minute winter | 88 | 34.000 | 89 | -0.2 | -0.002 | 0.000 | 11.3254 | |
| 2880 minute winter | 89 | 1.024 | 91 | 3.2 | 0.064 | 0.002 | 0.6265 | |
| 2880 minute winter | 89 | Infiltration | | 0.1 | | | | |
| 2880 minute winter | 90 | 35.000 | 91 | -0.3 | -0.005 | 0.000 | 22.3044 | |
| 2880 minute winter | 91 | 1.025 | 91_OUT | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 2880 minute winter | 91 | Infiltration | | 0.3 | | | | |
| 15 minute summer | 91_OUT | Pump | | 0.0 | | | | 0.0 |
| 15 minute winter | 93 | 36.001 | 95 | 10.3 | 1.092 | 0.140 | 0.6330 | |
| 15 minute winter | 94 | 37.000 | 95 | 7.1 | 0.708 | 0.173 | 0.4167 | |
| 15 minute winter | 95 | 36.002 | 96 | 19.0 | 1.207 | 0.241 | 0.6953 | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 96 | 11 | 4.215 | 0.115 | 19.7 | 0.1423 | 0.0000 | OK |
| 15 minute winter | 97 | 10 | 5.355 | 0.026 | 2.5 | 0.0388 | 0.0000 | OK |
| 15 minute winter | 98 | 11 | 4.835 | 0.033 | 2.6 | 0.0377 | 0.0000 | OK |
| 15 minute winter | 99 | 12 | 4.112 | 0.112 | 21.7 | 0.1264 | 0.0000 | OK |
| 15 minute winter | 100 | 10 | 5.922 | 0.022 | 5.8 | 0.0448 | 0.0000 | OK |
| 15 minute winter | 101 | 12 | 5.581 | 0.081 | 5.6 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 102 | 13 | 5.481 | 0.081 | 4.2 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 103 | 13 | 4.531 | 0.081 | 4.2 | 0.0000 | 0.0000 | OK |
| 180 minute winter | 104 | 112 | 4.013 | 0.463 | 2.5 | 0.0370 | 0.0000 | OK |
| 180 minute winter | 105 | 112 | 4.012 | 0.512 | 6.8 | 2.5157 | 0.0000 | OK |
| 180 minute winter | 106 | 112 | 4.012 | 0.562 | 9.0 | 2.7610 | 0.0000 | OK |
| 960 minute winter | 107 | 645 | 3.656 | 0.256 | 2.7 | 1.2590 | 0.0000 | OK |
| 15 minute summer | 108 | 1 | 4.013 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 109 | 10 | 3.966 | 0.066 | 10.2 | 0.1713 | 0.0000 | OK |
| 960 minute winter | 110 | 645 | 3.657 | 0.307 | 4.6 | 1.5064 | 0.0000 | OK |
| 720 minute winter | 111 | 510 | 3.656 | 0.356 | 3.7 | 0.0000 | 0.0000 | OK |
| 960 minute winter | 112 | 645 | 3.656 | 0.356 | 2.3 | 0.0025 | 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 | 96 | 36.003 | 99 | 19.4 | 0.972 | 0.464 | 0.3076 | |
| 15 minute winter | 97 | 38.000 | 98 | 2.5 | 0.986 | 0.027 | 0.0216 | |
| 15 minute winter | 98 | 38.001 | 99 | 2.3 | 0.638 | 0.046 | 0.2404 | |
| 15 minute winter | 99 | 36.004 | 106 | 21.7 | 1.217 | 0.382 | 0.0745 | |
| 15 minute winter | 100 | 39.000 | 101 | 5.6 | 0.349 | 0.001 | 0.9485 | |
| 15 minute winter | 101 | Weir | 102 | 4.2 | | | | |
| 15 minute winter | 101 | Infiltration | | 0.1 | | | | |
| 15 minute winter | 102 | Weir | 103 | 4.2 | | | | |
| 15 minute winter | 102 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 103 | Weir | 106 | 4.2 | | | | |
| 15 minute winter | 103 | Infiltration | | 0.0 | | | | |
| 180 minute winter | 104 | 40.000 | 105 | -2.3 | -0.011 | -0.001 | 11.0644 | |
| 180 minute winter | 105 | 40.001 | 106 | -6.8 | -0.023 | -0.002 | 5.9083 | |
| 180 minute winter | 105 | Infiltration | | 0.5 | | | | |
| 180 minute winter | 106 | 36.005 | 107 | 6.3 | 0.618 | 0.089 | 0.1236 | |
| 180 minute winter | 106 | Infiltration | | 0.3 | | | | |
| 960 minute winter | 107 | 36.006 | 110 | 3.6 | 0.016 | 0.002 | 8.7851 | |
| 15 minute summer | 108 | 41.000 | 109 | 0.0 | 0.000 | 0.000 | 0.0493 | |
| 15 minute winter | 109 | 41.001 | 110 | 10.0 | 1.089 | 0.162 | 0.0651 | |
| 960 minute winter | 110 | 36.007 | 111 | 3.4 | 0.049 | 0.003 | 2.9927 | |
| 960 minute winter | 110 | Infiltration | | 0.4 | | | | |
| 720 minute winter | 111 | 36.008 | 115 | 7.1 | 0.061 | 0.013 | 1.1221 | |
| 720 minute winter | 111 | Infiltration | | 0.1 | | | | |
| 720 minute winter | 111 | Infiltration | | 0.1 | | | | |
| 960 minute winter | 112 | 43.000 | 113 | -2.3 | 0.004 | -0.002 | 3.5343 | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | 113 | 660 | 3.656 | 0.356 | 4.2 | 0.0000 | 0.0000 | OK |
| 960 minute winter | 114 | 645 | 3.657 | 0.357 | 4.3 | 0.0000 | 0.0000 | OK |
| 960 minute winter | 115 | 645 | 3.658 | 0.358 | 16.6 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 117 | 510 | 3.658 | 0.358 | 18.7 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 119 | 495 | 3.655 | 0.355 | 15.1 | 0.9044 | 0.0000 | OK |
| 15 minute summer | 120 | 1 | 2.600 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 121 | 10 | 3.848 | 0.048 | 6.3 | 0.0966 | 0.0000 | OK |
| 15 minute summer | 122 | 1 | 3.350 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 123 | 1 | 2.550 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 4320 minute winter | 124 | 2700 | 2.720 | 0.170 | 0.1 | 0.0332 | 0.0000 | OK |
| 4320 minute winter | 125 | 2700 | 2.720 | 0.220 | 0.1 | 0.5602 | 0.0000 | OK |
| 15 minute summer | 126 | 1 | 2.550 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 127 | 1 | 2.500 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | 112 | 44.000 | 117 | 1.3 | 0.005 | 0.002 | 4.0369 | |
| 960 minute winter | 113 | 43.001 | 114 | 2.8 | -0.007 | 0.003 | 3.6116 | |
| 960 minute winter | 113 | 45.000 | 119 | -2.6 | -0.010 | -0.005 | 3.4420 | |
| 960 minute winter | 113 | Infiltration | | 0.2 | | | | |
| 960 minute winter | 114 | 43.002 | 115 | -4.3 | -0.019 | -0.004 | 6.4523 | |
| 960 minute winter | 114 | Infiltration | | 0.2 | | | | |
| 960 minute winter | 115 | 36.009 | 119 | -10.3 | -0.044 | -0.020 | 0.6890 | |
| 960 minute winter | 115 | Infiltration | | 0.1 | | | | |
| 960 minute winter | 115 | Infiltration | | 0.3 | | | | |
| 720 minute winter | 117 | 44.001 | 119 | -18.4 | -0.080 | -0.035 | 0.6605 | |
| 720 minute winter | 117 | Infiltration | | 0.2 | | | | |
| 720 minute winter | 119 | 36.010 | 123 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 720 minute winter | 119 | Infiltration | | 0.0 | | | | |
| 720 minute winter | 119 | Infiltration | | 0.0 | | | | |
| 720 minute winter | 119 | Infiltration | | 0.2 | | | | |
| 15 minute summer | 120 | 46.000 | 123 | 0.0 | 0.000 | 0.000 | 0.0007 | |
| 15 minute winter | 121 | 42.000 | 111 | 6.2 | 1.042 | 0.093 | 0.0358 | |
| 15 minute summer | 122 | 47.000 | 123 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 123 | 36.011 | 125 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 123 | Infiltration | | 0.0 | | | | |
| 4320 minute winter | 124 | 48.000 | 125 | 0.1 | 0.010 | 0.000 | 1.8130 | |
| 4320 minute winter | 125 | 36.012 | 127 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 4320 minute winter | 125 | Infiltration | | 0.1 | | | | |
| 15 minute summer | 126 | 49.000 | 127 | 0.0 | 0.000 | 0.000 | 0.0003 | |
| 15 minute summer | 127 | 36.013 | 129 | 0.0 | 0.000 | 0.000 | 0.0000 | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | 128 | 1 | 2.500 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 129 | 1 | 2.450 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 130 | 1 | 2.450 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 131 | 1 | 2.400 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 131_OUT | 1 | 2.850 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 92 | 11 | 6.610 | 0.010 | 0.3 | 0.0120 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | 127 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 128 | 50.000 | 129 | 0.0 | 0.000 | 0.000 | 0.0002 | |
| 15 minute summer | 129 | 36.014 | 131 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 129 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 130 | 51.000 | 131 | 0.0 | 0.000 | 0.000 | 0.0004 | |
| 15 minute summer | 131 | 36.015 | 131_OUT | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 131 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 131_OUT | Pump | | 0.0 | | | | 0.0 |
| 15 minute winter | 92 | 36.000 | 93 | 0.3 | 0.082 | 0.004 | 0.0364 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 1 | 10 | 12.099 | 0.069 | 16.0 | 0.1449 | 0.0000 | OK |
| 720 minute winter | 2 | 435 | 11.026 | 0.176 | 2.4 | 0.2271 | 0.0000 | OK |
| 720 minute winter | 3 | 435 | 11.026 | 0.051 | 0.5 | 0.0694 | 0.0000 | OK |
| 480 minute winter | 4 | 312 | 11.026 | 0.151 | 1.4 | 0.1707 | 0.0000 | OK |
| 15 minute summer | 5 | 1 | 11.900 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 6 | 435 | 11.026 | 0.226 | 3.3 | 4.8446 | 0.0000 | SURCHARGED |
| 720 minute winter | 7 | 435 | 11.025 | 0.525 | 1.4 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 8 | 435 | 11.025 | 0.575 | 2.8 | 2.8237 | 0.0000 | OK |
| 960 minute winter | 9 | 720 | 10.508 | 0.158 | 0.9 | 0.0000 | 0.0000 | OK |
| 960 minute winter | 10 | 720 | 10.508 | 0.208 | 1.7 | 1.0202 | 0.0000 | OK |
| 720 minute winter | 11 | 540 | 10.165 | 0.121 | 0.2 | 0.0148 | 0.0000 | OK |
| 720 minute winter | 12 | 540 | 10.165 | 0.145 | 0.4 | 0.7331 | 0.0000 | OK |
| 15 minute summer | 13 | 1 | 9.620 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 14 | 1 | 9.600 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 15 | 10 | 11.407 | 0.057 | 6.2 | 0.0879 | 0.0000 | OK |
| 15 minute winter | 16 | 10 | 11.194 | 0.067 | 17.2 | 0.1145 | 0.0000 | OK |
| 15 minute winter | 17 | 11 | 9.914 | 0.114 | 23.0 | 0.1694 | 0.0000 | OK |
| 15 minute winter | 18 | 11 | 9.440 | 0.083 | 30.0 | 0.1269 | 0.0000 | OK |
| 600 minute winter | 19 | 405 | 9.438 | 0.588 | 4.8 | 0.7469 | 0.0000 | SURCHARGED |
| 15 minute summer | 20 | 1 | 10.341 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 1 | 1.000 | 2 | 15.7 | 1.023 | 0.209 | 0.9294 | |
| 720 minute winter | 2 | 1.001 | 6 | 2.3 | 0.432 | 0.061 | 0.3473 | |
| 720 minute winter | 3 | 3.000 | 4 | 0.5 | 0.420 | 0.012 | 0.2547 | |
| 480 minute winter | 4 | 3.001 | 6 | 0.9 | 0.365 | 0.012 | 0.1281 | |
| 15 minute summer | 5 | 2.000 | 6 | 0.0 | 0.000 | 0.000 | 0.0002 | |
| 720 minute winter | 6 | 1.002 | 8 | 2.8 | 0.531 | 0.073 | 0.3684 | |
| 720 minute winter | 6 | Infiltration | | 0.0 | | | | |
| 720 minute winter | 7 | 4.000 | 8 | -1.4 | -0.005 | -0.001 | 22.7248 | |
| 720 minute winter | 8 | 1.003 | 10 | 1.8 | 0.770 | 0.024 | 0.0114 | |
| 720 minute winter | 8 | Infiltration | | 0.6 | | | | |
| 960 minute winter | 9 | 5.000 | 10 | -0.9 | -0.018 | -0.001 | 8.2217 | |
| 960 minute winter | 10 | 1.004 | 12 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 960 minute winter | 10 | Infiltration | | 0.2 | | | | |
| 720 minute winter | 11 | 6.000 | 12 | 0.1 | -0.002 | 0.000 | 5.0931 | |
| 720 minute winter | 12 | 1.005 | 14 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 720 minute winter | 12 | Infiltration | | 0.1 | | | | |
| 15 minute summer | 13 | 7.000 | 14 | 0.0 | 0.000 | 0.000 | 0.0015 | |
| 15 minute summer | 14 | 1.006 | 23 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 14 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 15 | 8.000 | 16 | 6.0 | 0.677 | 0.144 | 0.3037 | |
| 15 minute winter | 16 | 8.001 | 17 | 16.8 | 1.148 | 0.195 | 0.7334 | |
| 15 minute winter | 17 | 8.002 | 18 | 22.7 | 1.162 | 0.476 | 0.4624 | |
| 15 minute winter | 18 | 8.003 | 19 | 30.0 | 1.311 | 0.290 | 0.3000 | |
| 600 minute winter | 19 | 8.004 | 21 | 4.7 | 0.434 | 0.127 | 0.3966 | |
| 15 minute summer | 20 | 9.000 | 21 | 0.0 | 0.000 | 0.000 | 0.5716 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | 21 | 405 | 9.437 | 0.637 | 5.6 | 0.9331 | 0.0000 | SURCHARGED |
| 600 minute winter | 22 | 405 | 9.437 | 0.637 | 2.6 | 0.0000 | 0.0000 | OK |
| 600 minute winter | 23 | 405 | 9.437 | 0.687 | 6.3 | 0.2838 | 0.0000 | OK |
| 1440 minute winter | 24 | 1050 | 8.795 | 0.245 | 0.7 | 0.0000 | 0.0000 | OK |
| 1440 minute winter | 25 | 1050 | 8.795 | 0.295 | 1.6 | 1.4487 | 0.0000 | OK |
| 720 minute winter | 26 | 660 | 8.429 | 0.029 | 0.1 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 27 | 660 | 8.429 | 0.129 | 0.3 | 0.6524 | 0.0000 | OK |
| 15 minute summer | 28 | 1 | 8.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 29 | 1 | 8.250 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 30 | 1 | 8.050 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 31 | 1 | 8.000 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 32 | 1 | 7.546 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 33 | 1 | 6.650 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 34 | 1 | 6.500 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 35 | 1 | 6.400 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 36 | 10 | 9.215 | 0.065 | 3.1 | 0.0345 | 0.0000 | OK |
| 15 minute winter | 37 | 10 | 8.630 | 0.130 | 8.7 | 0.1241 | 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) |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | 21 | 8.005 | 23 | 5.3 | 0.760 | 0.087 | 0.1444 | |
| 600 minute winter | 22 | 10.000 | 23 | -2.6 | -0.014 | -0.002 | 50.3126 | |
| 600 minute winter | 23 | Hydro-Brake® | 25 | 1.8 | | | | |
| 600 minute winter | 23 | Infiltration | | 1.4 | | | | |
| 1440 minute winter | 24 | 11.000 | 25 | -0.7 | -0.011 | -0.001 | 16.6897 | |
| 1440 minute winter | 25 | 1.008 | 27 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 1440 minute winter | 25 | Infiltration | | 0.5 | | | | |
| 720 minute winter | 26 | 12.000 | 27 | -0.1 | -0.002 | 0.000 | 3.2749 | |
| 720 minute winter | 27 | 1.009 | 29 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 720 minute winter | 27 | Infiltration | | 0.1 | | | | |
| 15 minute summer | 28 | 13.000 | 29 | 0.0 | 0.000 | 0.000 | 0.0004 | |
| 15 minute summer | 29 | 1.010 | 31 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 29 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 30 | 14.000 | 31 | 0.0 | 0.000 | 0.000 | 0.0003 | |
| 15 minute summer | 31 | 1.011 | 32 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 31 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 32 | 1.012 | 33 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 33 | 1.013 | 34 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 34 | 1.014 | 35 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 35 | 1.015 | 45 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute winter | 36 | Weir | 37 | 3.1 | | | | |
| 15 minute winter | 37 | Weir | 38 | 8.7 | | | | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 38 | 10 | 7.684 | 0.184 | 14.7 | 0.1693 | 0.0000 | OK |
| 15 minute summer | 39 | 1 | 6.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 40 | 510 | 6.240 | 0.240 | 0.2 | 0.2717 | 0.0000 | SURCHARGED |
| 720 minute winter | 41 | 510 | 6.240 | 0.290 | 1.8 | 6.1615 | 0.0000 | SURCHARGED |
| 15 minute winter | 42 | 10 | 7.357 | 0.057 | 13.4 | 0.0950 | 0.0000 | OK |
| 720 minute winter | 43 | 510 | 6.240 | 0.337 | 1.7 | 0.3813 | 0.0000 | SURCHARGED |
| 720 minute winter | 44 | 510 | 6.240 | 0.840 | 5.5 | 0.0638 | 0.0000 | SURCHARGED |
| 720 minute winter | 45 | 510 | 6.240 | 0.940 | 5.8 | 5.0080 | 0.0000 | SURCHARGED |
| 720 minute winter | 46 | 510 | 6.240 | 0.440 | 2.0 | 0.7776 | 0.0000 | SURCHARGED |
| 360 minute winter | 47 | 448 | 5.713 | 0.463 | 0.8 | 0.0000 | 0.0000 | OK |
| 480 minute winter | 48 | 560 | 5.713 | 0.513 | 1.4 | 1.3058 | 0.0000 | OK |
| 2160 minute winter | 49 | 1380 | 5.313 | 0.563 | 0.5 | 0.0000 | 0.0000 | OK |
| 2160 minute winter | 50 | 1320 | 5.313 | 0.613 | 1.3 | 1.5590 | 0.0000 | OK |
| 180 minute winter | 51 | 124 | 4.669 | 0.369 | 4.8 | 1.8095 | 0.0000 | OK |
| 15 minute summer | 52 | 1 | 6.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 53 | 1 | 4.950 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 55 | 10 | 11.344 | 0.044 | 7.1 | 0.0693 | 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 | 38 | Weir | 41 | 14.5 | | | | |
| 15 minute summer | 39 | 16.000 | 40 | 0.0 | 0.000 | 0.000 | 0.2153 | |
| 720 minute winter | 40 | 16.001 | 41 | -0.2 | -0.025 | -0.002 | 0.0892 | |
| 720 minute winter | 41 | Weir | 45 | 1.6 | | | | |
| 720 minute winter | 41 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 42 | 17.000 | 43 | 13.2 | 1.293 | 0.140 | 0.4361 | |
| 720 minute winter | 43 | 17.001 | 45 | 1.7 | 0.530 | 0.032 | 0.3935 | |
| 720 minute winter | 44 | 18.000 | 45 | -5.4 | -0.006 | -0.002 | 32.0210 | |
| 720 minute winter | 45 | 1.016 | 46 | -2.2 | -0.146 | -0.017 | 0.2601 | |
| 720 minute winter | 45 | Infiltration | | 0.4 | | | | |
| 720 minute winter | 46 | 1.017 | 48 | 1.4 | 0.521 | 0.013 | 0.0287 | |
| 360 minute winter | 47 | 19.000 | 48 | -0.8 | -0.015 | -0.001 | 8.6022 | |
| 480 minute winter | 48 | 1.018 | 50 | 1.3 | 1.253 | 0.003 | 0.0033 | |
| 480 minute winter | 48 | Infiltration | | 0.1 | | | | |
| 2160 minute winter | 49 | 20.000 | 50 | -0.5 | -0.006 | 0.000 | 5.2502 | |
| 2160 minute winter | 50 | 1.019 | 51 | 1.1 | 1.192 | 0.003 | 0.0042 | |
| 2160 minute winter | 50 | Infiltration | | 0.1 | | | | |
| 2160 minute winter | 50 | Infiltration | | 0.1 | | | | |
| 180 minute winter | 51 | 1.020 | 81 | -4.8 | -0.040 | -0.004 | 28.0841 | |
| 15 minute summer | 52 | 30.000 | 53 | 0.0 | 0.000 | 0.000 | 0.0004 | |
| 15 minute summer | 53 | Weir | 81 | 0.0 | | | | |
| 15 minute summer | 53 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 55 | 21.000 | 56 | 7.0 | 1.039 | 0.084 | 0.2368 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 56 | 10 | 10.458 | 0.058 | 15.8 | 0.0990 | 0.0000 | OK |
| 15 minute winter | 57 | 11 | 9.194 | 0.094 | 16.9 | 0.1157 | 0.0000 | OK |
| 15 minute winter | 58 | 11 | 9.096 | 0.096 | 16.8 | 0.1085 | 0.0000 | OK |
| 60 minute winter | 59 | 39 | 9.001 | 0.551 | 4.9 | 0.0000 | 0.0000 | OK |
| 60 minute winter | 60 | 39 | 9.000 | 0.600 | 10.2 | 1.5282 | 0.0000 | OK |
| 60 minute winter | 61 | 40 | 8.850 | 0.050 | 7.7 | 0.0568 | 0.0000 | OK |
| 720 minute winter | 62 | 450 | 8.616 | 0.466 | 1.2 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 63 | 450 | 8.616 | 0.516 | 2.2 | 1.3127 | 0.0000 | OK |
| 720 minute winter | 64 | 450 | 8.169 | 0.019 | 1.4 | 0.0213 | 0.0000 | OK |
| 15 minute winter | 65 | 10 | 8.061 | 0.061 | 12.5 | 0.1145 | 0.0000 | OK |
| 960 minute winter | 66 | 585 | 7.834 | 0.534 | 1.5 | 0.6925 | 0.0000 | SURCHARGED |
| 960 minute winter | 67 | 585 | 7.833 | 0.583 | 1.4 | 1.4850 | 0.0000 | OK |
| 960 minute winter | 68 | 585 | 7.833 | 0.633 | 2.7 | 1.7098 | 0.0000 | OK |
| 1440 minute winter | 69 | 900 | 7.219 | 0.519 | 1.3 | 0.0000 | 0.0000 | OK |
| 1440 minute winter | 70 | 900 | 7.219 | 0.619 | 2.4 | 3.0391 | 0.0000 | OK |
| 15 minute winter | 71 | 10 | 8.875 | 0.091 | 14.7 | 0.1503 | 0.0000 | OK |
| 15 minute winter | 72 | 10 | 8.446 | 0.046 | 4.3 | 0.0630 | 0.0000 | OK |
| 15 minute winter | 73 | 11 | 8.331 | 0.063 | 21.8 | 0.0853 | 0.0000 | OK |
| 15 minute winter | 74 | 11 | 7.683 | 0.088 | 24.4 | 0.1390 | 0.0000 | OK |
| 15 minute winter | 75 | 11 | 7.365 | 0.565 | 31.5 | 0.9130 | 0.0000 | SURCHARGED |
| 15 minute winter | 76 | 11 | 6.524 | 0.024 | 1.5 | 0.0359 | 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 | 56 | 21.001 | 57 | 15.5 | 1.328 | 0.147 | 0.3773 | |
| 15 minute winter | 57 | 21.002 | 58 | 16.8 | 1.061 | 0.308 | 0.1435 | |
| 15 minute winter | 58 | 21.003 | 60 | 16.9 | 1.152 | 0.293 | 0.0599 | |
| 60 minute winter | 59 | 22.000 | 60 | -4.9 | -0.057 | -0.005 | 7.4111 | |
| 60 minute winter | 60 | 21.004 | 61 | 7.7 | 1.165 | 0.097 | 0.0430 | |
| 60 minute winter | 61 | 21.005 | 63 | 7.7 | 1.213 | 0.099 | 0.0569 | |
| 720 minute winter | 62 | 23.000 | 63 | -1.2 | -0.049 | -0.002 | 15.7327 | |
| 720 minute winter | 63 | 21.006 | 64 | 1.4 | 1.013 | 0.010 | 0.0081 | |
| 720 minute winter | 64 | 21.007 | 68 | 1.4 | 0.563 | 0.014 | 0.0252 | |
| 15 minute winter | 65 | 24.000 | 66 | 12.3 | 1.008 | 0.164 | 0.4490 | |
| 960 minute winter | 66 | 24.001 | 67 | 1.4 | 0.294 | 0.029 | 0.1409 | |
| 960 minute winter | 67 | 24.002 | 68 | 1.3 | 0.032 | 0.002 | 18.1498 | |
| 960 minute winter | 68 | 21.008 | 70 | 2.7 | 0.742 | 0.047 | 0.0736 | |
| 1440 minute winter | 69 | 25.000 | 70 | -1.3 | -0.003 | 0.000 | 12.9254 | |
| 1440 minute winter | 70 | 21.009 | 75 | 2.0 | 0.175 | 0.015 | 0.0743 | |
| 15 minute winter | 71 | 26.000 | 73 | 14.2 | 1.192 | 0.308 | 0.7826 | |
| 15 minute winter | 72 | 27.000 | 73 | 4.2 | 0.572 | 0.094 | 0.1309 | |
| 15 minute winter | 73 | 26.001 | 74 | 21.8 | 1.864 | 0.174 | 0.1380 | |
| 15 minute winter | 74 | 26.002 | 75 | 24.5 | 0.771 | 0.326 | 1.0257 | |
| 15 minute winter | 75 | 21.010 | 77 | 6.0 | 1.561 | 0.050 | 0.0477 | |
| 15 minute winter | 76 | 28.000 | 77 | 1.4 | 0.648 | 0.023 | 0.0555 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 77 | 10 | 5.858 | 0.058 | 11.9 | 0.0985 | 0.0000 | OK |
| 15 minute winter | 78 | 10 | 5.645 | 0.045 | 7.5 | 0.0725 | 0.0000 | OK |
| 15 minute winter | 79 | 11 | 4.683 | 0.133 | 32.5 | 0.1744 | 0.0000 | OK |
| 15 minute winter | 80 | 11 | 4.719 | 0.119 | 23.1 | 0.2384 | 0.0000 | OK |
| 180 minute winter | 81 | 124 | 4.669 | 0.419 | 14.2 | 2.0549 | 0.0000 | OK |
| 2880 minute winter | 82 | 2100 | 4.358 | 0.658 | 2.1 | 0.0863 | 0.0000 | OK |
| 2880 minute winter | 83 | 2100 | 4.359 | 0.679 | 5.9 | 3.3324 | 0.0000 | SURCHARGED |
| 15 minute winter | 84 | 10 | 4.453 | 0.053 | 6.4 | 0.0269 | 0.0000 | OK |
| 2880 minute winter | 85 | 2100 | 4.359 | 0.209 | 0.3 | 0.2747 | 0.0000 | OK |
| 2880 minute winter | 86 | 2100 | 4.359 | 0.259 | 0.7 | 0.2926 | 0.0000 | SURCHARGED |
| 2880 minute winter | 87 | 2100 | 4.360 | 0.710 | 4.2 | 1.8071 | 0.0000 | SURCHARGED |
| 2880 minute winter | 88 | 2100 | 4.358 | 0.658 | 5.9 | 0.0000 | 0.0000 | OK |
| 2880 minute winter | 89 | 2100 | 4.357 | 0.727 | 8.6 | 0.0000 | 0.0000 | SURCHARGED |
| 2880 minute winter | 90 | 2100 | 4.358 | 0.708 | 2.5 | 0.0000 | 0.0000 | SURCHARGED |
| 2880 minute winter | 91 | 2100 | 4.359 | 0.759 | 3.0 | 0.0000 | 0.0000 | SURCHARGED |
| 2880 minute winter | 91_OUT | 2100 | 4.361 | 0.461 | 0.3 | 0.5218 | 0.0000 | OK |
| 15 minute winter | 93 | 10 | 6.486 | 0.086 | 23.5 | 0.2136 | 0.0000 | OK |
| 15 minute winter | 94 | 10 | 5.456 | 0.098 | 16.2 | 0.1887 | 0.0000 | OK |
| 15 minute winter | 95 | 11 | 5.220 | 0.117 | 43.2 | 0.1642 | 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 | 77 | 21.011 | 80 | 11.8 | 0.961 | 0.149 | 0.7679 | |
| 15 minute winter | 78 | 29.000 | 79 | 7.4 | 0.529 | 0.087 | 0.5921 | |
| 15 minute winter | 79 | 21.013 | 81 | 32.6 | 1.183 | 0.324 | 0.1678 | |
| 15 minute winter | 80 | 21.012 | 79 | 22.6 | 0.811 | 0.237 | 0.1896 | |
| 180 minute winter | 81 | 1.021 | 83 | 9.6 | 0.929 | 0.047 | 0.1207 | |
| 180 minute winter | 81 | Infiltration | | 0.3 | | | | |
| 2880 minute winter | 82 | 31.000 | 83 | 2.5 | -0.005 | 0.003 | 43.3347 | |
| 2880 minute winter | 83 | 1.022 | 87 | 4.0 | 0.068 | 0.007 | 17.9765 | |
| 2880 minute winter | 83 | Infiltration | | 0.5 | | | | |
| 15 minute winter | 84 | 32.000 | 86 | 6.3 | 0.795 | 0.124 | 0.2486 | |
| 2880 minute winter | 85 | 33.000 | 86 | 0.3 | 0.200 | 0.007 | 0.3294 | |
| 2880 minute winter | 86 | 32.001 | 87 | 1.3 | 0.466 | 0.018 | 0.1112 | |
| 2880 minute winter | 87 | 1.023 | 89 | 8.4 | 0.082 | 0.005 | 1.3893 | |
| 2880 minute winter | 87 | Infiltration | | 0.2 | | | | |
| 2880 minute winter | 88 | 34.000 | 89 | -5.9 | -0.011 | -0.004 | 35.6270 | |
| 2880 minute winter | 89 | 1.024 | 91 | 3.0 | 0.044 | 0.002 | 1.7233 | |
| 2880 minute winter | 89 | Infiltration | | 0.4 | | | | |
| 2880 minute winter | 90 | 35.000 | 91 | -2.5 | -0.004 | -0.002 | 62.8416 | |
| 2880 minute winter | 91 | 1.025 | 91_OUT | 0.3 | 0.005 | 0.001 | 0.1873 | |
| 2880 minute winter | 91 | Infiltration | | 0.8 | | | | |
| 2880 minute winter | 91_OUT | Pump | | 0.0 | | | | 0.0 |
| 15 minute winter | 93 | 36.001 | 95 | 22.9 | 1.344 | 0.313 | 1.1337 | |
| 15 minute winter | 94 | 37.000 | 95 | 15.9 | 0.867 | 0.388 | 0.7487 | |
| 15 minute winter | 95 | 36.002 | 96 | 42.7 | 1.408 | 0.540 | 1.3193 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 96 | 11 | 4.324 | 0.224 | 44.3 | 0.2774 | 0.0000 | OK |
| 15 minute winter | 97 | 10 | 5.368 | 0.039 | 5.5 | 0.0576 | 0.0000 | OK |
| 15 minute winter | 98 | 11 | 4.852 | 0.050 | 5.6 | 0.0571 | 0.0000 | OK |
| 15 minute winter | 99 | 12 | 4.192 | 0.192 | 48.3 | 0.2173 | 0.0000 | OK |
| 15 minute winter | 100 | 10 | 5.933 | 0.033 | 12.7 | 0.0693 | 0.0000 | OK |
| 15 minute winter | 101 | 13 | 5.638 | 0.138 | 12.4 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 102 | 13 | 5.533 | 0.133 | 9.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 103 | 13 | 4.583 | 0.133 | 9.0 | 0.0000 | 0.0000 | OK |
| 60 minute winter | 104 | 38 | 4.100 | 0.550 | 10.3 | 0.0440 | 0.0000 | OK |
| 60 minute winter | 105 | 39 | 4.100 | 0.600 | 25.9 | 2.9469 | 0.0000 | OK |
| 60 minute winter | 106 | 39 | 4.100 | 0.650 | 36.9 | 3.1927 | 0.0000 | OK |
| 360 minute winter | 107 | 232 | 3.943 | 0.543 | 11.6 | 2.6655 | 0.0000 | OK |
| 15 minute summer | 108 | 1 | 4.013 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 109 | 10 | 4.005 | 0.105 | 22.6 | 0.2711 | 0.0000 | OK |
| 360 minute winter | 110 | 224 | 3.943 | 0.593 | 13.3 | 2.9096 | 0.0000 | OK |
| 360 minute winter | 111 | 224 | 3.943 | 0.643 | 58.7 | 0.0000 | 0.0000 | OK |
| 360 minute winter | 112 | 224 | 3.943 | 0.643 | 57.8 | 0.0045 | 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 | 96 | 36.003 | 99 | 43.0 | 1.121 | 1.030 | 0.5846 | |
| 15 minute winter | 97 | 38.000 | 98 | 5.4 | 1.237 | 0.059 | 0.0380 | |
| 15 minute winter | 98 | 38.001 | 99 | 5.3 | 0.814 | 0.107 | 0.4357 | |
| 15 minute winter | 99 | 36.004 | 106 | 48.2 | 1.457 | 0.845 | 0.1368 | |
| 15 minute winter | 100 | 39.000 | 101 | 12.4 | 0.422 | 0.003 | 2.1277 | |
| 15 minute winter | 101 | Weir | 102 | 9.0 | | | | |
| 15 minute winter | 101 | Infiltration | | 0.3 | | | | |
| 15 minute winter | 102 | Weir | 103 | 9.0 | | | | |
| 15 minute winter | 102 | Infiltration | | 0.1 | | | | |
| 15 minute winter | 103 | Weir | 106 | 9.0 | | | | |
| 15 minute winter | 103 | Infiltration | | 0.0 | | | | |
| 60 minute winter | 104 | 40.000 | 105 | -9.5 | -0.039 | -0.005 | 13.0545 | |
| 60 minute winter | 105 | 40.001 | 106 | -25.9 | -0.084 | -0.009 | 6.8745 | |
| 60 minute winter | 105 | Infiltration | | 0.6 | | | | |
| 60 minute winter | 106 | 36.005 | 107 | 31.5 | 0.948 | 0.443 | 0.4022 | |
| 60 minute winter | 106 | Infiltration | | 0.3 | | | | |
| 360 minute winter | 107 | 36.006 | 110 | 9.3 | 0.034 | 0.005 | 17.7039 | |
| 15 minute summer | 108 | 41.000 | 109 | 0.0 | 0.000 | 0.000 | 0.0915 | |
| 15 minute winter | 109 | 41.001 | 110 | 22.3 | 1.329 | 0.360 | 0.1186 | |
| 360 minute winter | 110 | 36.007 | 111 | 16.6 | 0.087 | 0.014 | 5.5743 | |
| 360 minute winter | 110 | Infiltration | | 0.9 | | | | |
| 360 minute winter | 111 | 36.008 | 115 | -47.5 | 0.118 | -0.090 | 2.0251 | |
| 360 minute winter | 111 | Infiltration | | 0.3 | | | | |
| 360 minute winter | 111 | Infiltration | | 0.3 | | | | |
| 360 minute winter | 112 | 43.000 | 113 | 61.4 | 0.062 | 0.058 | 6.3866 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | 113 | 224 | 3.943 | 0.643 | 62.2 | 0.0000 | 0.0000 | OK |
| 360 minute winter | 114 | 224 | 3.943 | 0.643 | 84.1 | 0.0000 | 0.0000 | OK |
| 240 minute summer | 115 | 180 | 3.950 | 0.650 | 97.1 | 0.0000 | 0.0000 | OK |
| 2160 minute winter | 117 | 1320 | 3.962 | 0.662 | 252.3 | 0.0000 | 0.0000 | SURCHARGED |
| 960 minute summer | 119 | 615 | 3.953 | 0.653 | 108.0 | 1.6621 | 0.0000 | OK |
| 480 minute winter | 120 | 328 | 3.250 | 0.650 | 4.2 | 0.0000 | 0.0000 | OK |
| 240 minute winter | 121 | 164 | 3.947 | 0.147 | 7.4 | 0.2973 | 0.0000 | OK |
| 15 minute summer | 122 | 1 | 3.350 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 480 minute winter | 123 | 328 | 3.249 | 0.699 | 8.5 | 0.0000 | 0.0000 | OK |
| 480 minute winter | 124 | 328 | 3.086 | 0.536 | 1.5 | 0.1046 | 0.0000 | OK |
| 480 minute winter | 125 | 328 | 3.086 | 0.586 | 3.9 | 1.4923 | 0.0000 | OK |
| 720 minute winter | 126 | 510 | 3.027 | 0.477 | 1.5 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 127 | 510 | 3.027 | 0.527 | 3.2 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | 112 | 44.000 | 117 | -57.8 | -0.116 | -0.110 | 7.2827 | |
| 360 minute winter | 113 | 43.001 | 114 | 55.5 | 0.056 | 0.053 | 6.5211 | |
| 360 minute winter | 113 | 45.000 | 119 | 37.8 | 0.078 | 0.072 | 6.2477 | |
| 360 minute winter | 113 | Infiltration | | 0.3 | | | | |
| 360 minute winter | 114 | 43.002 | 115 | -36.2 | -0.040 | -0.034 | 11.6055 | |
| 360 minute winter | 114 | Infiltration | | 0.3 | | | | |
| 240 minute summer | 115 | 36.009 | 119 | -76.0 | 0.161 | -0.144 | 1.2216 | |
| 240 minute summer | 115 | Infiltration | | 0.1 | | | | |
| 240 minute summer | 115 | Infiltration | | 0.6 | | | | |
| 2160 minute winter | 117 | 44.001 | 119 | -242.3 | -0.485 | -0.459 | 1.1669 | |
| 2160 minute winter | 117 | Infiltration | | 0.4 | | | | |
| 960 minute summer | 119 | 36.010 | 123 | 8.2 | 5.092 | 0.070 | 0.0792 | |
| 960 minute summer | 119 | Infiltration | | 0.1 | | | | |
| 960 minute summer | 119 | Infiltration | | 0.1 | | | | |
| 960 minute summer | 119 | Infiltration | | 0.3 | | | | |
| 480 minute winter | 120 | 46.000 | 123 | -4.2 | -0.041 | -0.006 | 15.5963 | |
| 240 minute winter | 121 | 42.000 | 111 | 5.4 | 0.892 | 0.080 | 0.2012 | |
| 15 minute summer | 122 | 47.000 | 123 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 480 minute winter | 123 | 36.011 | 125 | 3.6 | 0.786 | 0.028 | 0.0168 | |
| 480 minute winter | 123 | Infiltration | | 0.8 | | | | |
| 480 minute winter | 124 | 48.000 | 125 | -1.2 | 0.024 | -0.001 | 5.2165 | |
| 480 minute winter | 125 | 36.012 | 127 | 3.6 | 0.767 | 0.029 | 0.0191 | |
| 480 minute winter | 125 | Infiltration | | 0.3 | | | | |
| 720 minute winter | 126 | 49.000 | 127 | -1.5 | -0.017 | -0.001 | 4.2820 | |
| 720 minute winter | 127 | 36.013 | 129 | 2.1 | 0.707 | 0.015 | 0.0098 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | 128 | 585 | 2.966 | 0.466 | 0.9 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 129 | 585 | 2.966 | 0.516 | 2.1 | 1.3127 | 0.0000 | OK |
| 720 minute winter | 130 | 600 | 2.512 | 0.062 | 0.4 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 131 | 600 | 2.512 | 0.112 | 0.6 | 0.2850 | 0.0000 | OK |
| 15 minute summer | 131_OUT | 1 | 2.850 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 92 | 10 | 6.615 | 0.015 | 0.7 | 0.0174 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | 127 | Infiltration | | 0.2 | | | | |
| 720 minute winter | 128 | 50.000 | 129 | -0.9 | -0.006 | -0.001 | 3.9685 | |
| 720 minute winter | 129 | 36.014 | 131 | 0.6 | 0.453 | 0.005 | 0.0055 | |
| 720 minute winter | 129 | Infiltration | | 0.2 | | | | |
| 720 minute winter | 130 | 51.000 | 131 | -0.4 | -0.006 | 0.000 | 1.2017 | |
| 720 minute winter | 131 | 36.015 | 131_OUT | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 720 minute winter | 131 | Infiltration | | 0.1 | | | | |
| 15 minute summer | 131_OUT | Pump | | 0.0 | | | | 0.0 |
| 15 minute winter | 92 | 36.000 | 93 | 0.7 | 0.101 | 0.008 | 0.0647 | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 1 | 10 | 12.122 | 0.092 | 26.8 | 0.1909 | 0.0000 | OK |
| 180 minute winter | 2 | 112 | 11.066 | 0.216 | 9.6 | 0.2798 | 0.0000 | OK |
| 180 minute winter | 3 | 112 | 11.064 | 0.089 | 2.1 | 0.1225 | 0.0000 | OK |
| 180 minute winter | 4 | 116 | 11.063 | 0.188 | 2.8 | 0.2129 | 0.0000 | OK |
| 15 minute summer | 5 | 1 | 11.900 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 180 minute winter | 6 | 112 | 11.064 | 0.264 | 14.3 | 5.6732 | 0.0000 | SURCHARGED |
| 180 minute winter | 7 | 112 | 11.059 | 0.559 | 5.0 | 0.0000 | 0.0000 | OK |
| 180 minute winter | 8 | 112 | 11.059 | 0.609 | 11.1 | 2.9886 | 0.0000 | OK |
| 960 minute winter | 9 | 645 | 10.918 | 0.568 | 1.9 | 0.0000 | 0.0000 | OK |
| 960 minute winter | 10 | 645 | 10.918 | 0.618 | 3.8 | 3.0322 | 0.0000 | OK |
| 1440 minute winter | 11 | 1020 | 10.319 | 0.275 | 0.4 | 0.0339 | 0.0000 | OK |
| 1440 minute winter | 12 | 1020 | 10.319 | 0.299 | 1.0 | 1.5180 | 0.0000 | OK |
| 15 minute summer | 13 | 1 | 9.620 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 14 | 1 | 9.600 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 15 | 10 | 11.426 | 0.076 | 10.4 | 0.1163 | 0.0000 | OK |
| 15 minute winter | 16 | 10 | 11.215 | 0.088 | 29.0 | 0.1512 | 0.0000 | OK |
| 15 minute winter | 17 | 11 | 9.962 | 0.162 | 38.7 | 0.2408 | 0.0000 | OK |
| 600 minute winter | 18 | 435 | 9.830 | 0.473 | 7.1 | 0.7266 | 0.0000 | SURCHARGED |
| 600 minute winter | 19 | 435 | 9.830 | 0.980 | 7.5 | 1.2452 | 0.0000 | SURCHARGED |
| 15 minute summer | 20 | 1 | 10.341 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 1 | 1.000 | 2 | 26.4 | 1.124 | 0.351 | 1.4170 | |
| 180 minute winter | 2 | 1.001 | 6 | 9.0 | 0.635 | 0.240 | 0.3759 | |
| 180 minute winter | 3 | 3.000 | 4 | 2.1 | 0.627 | 0.049 | 0.3655 | |
| 180 minute winter | 4 | 3.001 | 6 | 4.1 | 0.420 | 0.056 | 0.1417 | |
| 15 minute summer | 5 | 2.000 | 6 | 0.0 | 0.000 | 0.000 | 0.0002 | |
| 180 minute winter | 6 | 1.002 | 8 | 11.1 | 0.787 | 0.292 | 0.3686 | |
| 180 minute winter | 6 | Infiltration | | 0.0 | | | | |
| 180 minute winter | 7 | 4.000 | 8 | -5.0 | -0.022 | -0.003 | 24.1131 | |
| 180 minute winter | 8 | 1.003 | 10 | 9.2 | 1.199 | 0.123 | 0.0374 | |
| 180 minute winter | 8 | Infiltration | | 0.7 | | | | |
| 960 minute winter | 9 | 5.000 | 10 | -1.9 | -0.016 | -0.001 | 26.6557 | |
| 960 minute winter | 10 | 1.004 | 12 | 1.0 | 0.691 | 0.012 | 0.0147 | |
| 960 minute winter | 10 | Infiltration | | 0.7 | | | | |
| 1440 minute winter | 11 | 6.000 | 12 | -0.3 | -0.002 | 0.000 | 11.0381 | |
| 1440 minute winter | 12 | 1.005 | 14 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 1440 minute winter | 12 | Infiltration | | 0.3 | | | | |
| 15 minute summer | 13 | 7.000 | 14 | 0.0 | 0.000 | 0.000 | 0.0015 | |
| 15 minute summer | 14 | 1.006 | 23 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 14 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 15 | 8.000 | 16 | 10.2 | 0.778 | 0.243 | 0.4461 | |
| 15 minute winter | 16 | 8.001 | 17 | 28.4 | 1.283 | 0.330 | 1.0979 | |
| 15 minute winter | 17 | 8.002 | 18 | 38.2 | 1.298 | 0.801 | 0.6962 | |
| 600 minute winter | 18 | 8.003 | 19 | 6.9 | 0.593 | 0.067 | 0.5138 | |
| 600 minute winter | 19 | 8.004 | 21 | 7.4 | 0.470 | 0.202 | 0.3966 | |
| 15 minute summer | 20 | 9.000 | 21 | 0.0 | 0.000 | 0.000 | 0.9368 | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | 21 | 435 | 9.829 | 1.029 | 8.8 | 1.5069 | 0.0000 | SURCHARGED |
| 600 minute winter | 22 | 435 | 9.829 | 1.029 | 3.4 | 0.0000 | 0.0000 | SURCHARGED |
| 600 minute winter | 23 | 435 | 9.829 | 1.079 | 10.1 | 0.4457 | 0.0000 | SURCHARGED |
| 2160 minute winter | 24 | 1500 | 9.115 | 0.565 | 0.7 | 0.0000 | 0.0000 | OK |
| 2160 minute winter | 25 | 1500 | 9.115 | 0.615 | 1.9 | 3.0170 | 0.0000 | OK |
| 2160 minute winter | 26 | 1620 | 8.563 | 0.163 | 0.4 | 0.0000 | 0.0000 | OK |
| 2160 minute winter | 27 | 1620 | 8.563 | 0.263 | 0.9 | 1.3321 | 0.0000 | OK |
| 15 minute summer | 28 | 1 | 8.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 29 | 1 | 8.250 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 30 | 1 | 8.050 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 31 | 1 | 8.000 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 32 | 1 | 7.546 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 33 | 540 | 6.731 | 0.081 | 0.1 | 0.0918 | 0.0000 | OK |
| 720 minute winter | 34 | 540 | 6.731 | 0.231 | 0.2 | 0.2615 | 0.0000 | SURCHARGED |
| 720 minute winter | 35 | 540 | 6.731 | 0.331 | 0.3 | 0.3748 | 0.0000 | SURCHARGED |
| 15 minute winter | 36 | 10 | 9.242 | 0.092 | 5.2 | 0.0488 | 0.0000 | OK |
| 15 minute winter | 37 | 10 | 8.684 | 0.184 | 14.6 | 0.1751 | 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) |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | 21 | 8.005 | 23 | 8.5 | 0.699 | 0.139 | 0.1444 | |
| 600 minute winter | 22 | 10.000 | 23 | -3.4 | -0.010 | -0.003 | 80.0836 | |
| 600 minute winter | 23 | Hydro-Brake® | 25 | 2.0 | | | | |
| 600 minute winter | 23 | Infiltration | | 2.2 | | | | |
| 2160 minute winter | 24 | 11.000 | 25 | -0.7 | -0.004 | -0.001 | 36.4278 | |
| 2160 minute winter | 25 | 1.008 | 27 | 0.8 | 0.765 | 0.008 | 0.0053 | |
| 2160 minute winter | 25 | Infiltration | | 1.0 | | | | |
| 2160 minute winter | 26 | 12.000 | 27 | -0.4 | -0.002 | 0.000 | 8.8499 | |
| 2160 minute winter | 27 | 1.009 | 29 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 2160 minute winter | 27 | Infiltration | | 0.2 | | | | |
| 15 minute summer | 28 | 13.000 | 29 | 0.0 | 0.000 | 0.000 | 0.0004 | |
| 15 minute summer | 29 | 1.010 | 31 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 29 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 30 | 14.000 | 31 | 0.0 | 0.000 | 0.000 | 0.0003 | |
| 15 minute summer | 31 | 1.011 | 32 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 15 minute summer | 31 | Infiltration | | 0.0 | | | | |
| 15 minute summer | 32 | 1.012 | 33 | 0.0 | 0.000 | 0.000 | 0.0000 | |
| 720 minute winter | 33 | 1.013 | 34 | -0.1 | -0.009 | -0.002 | 0.1865 | |
| 720 minute winter | 34 | 1.014 | 35 | -0.2 | 0.011 | -0.004 | 0.3152 | |
| 720 minute winter | 35 | 1.015 | 45 | -0.3 | -0.010 | -0.004 | 0.2399 | |
| 15 minute winter | 36 | Weir | 37 | 5.1 | | | | |
| 15 minute winter | 37 | Weir | 38 | 14.5 | | | | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 38 | 10 | 7.760 | 0.260 | 24.6 | 0.2395 | 0.0000 | OK |
| 720 minute winter | 39 | 540 | 6.732 | 0.432 | 0.3 | 0.4886 | 0.0000 | SURCHARGED |
| 720 minute winter | 40 | 540 | 6.731 | 0.731 | 0.8 | 0.8263 | 0.0000 | SURCHARGED |
| 720 minute winter | 41 | 540 | 6.732 | 0.782 | 2.9 | 16.6005 | 0.0000 | SURCHARGED |
| 15 minute winter | 42 | 10 | 7.374 | 0.074 | 22.5 | 0.1240 | 0.0000 | OK |
| 720 minute winter | 43 | 540 | 6.731 | 0.828 | 2.7 | 0.9364 | 0.0000 | SURCHARGED |
| 720 minute winter | 44 | 540 | 6.731 | 1.331 | 1.6 | 0.1012 | 0.0000 | FLOOD RISK |
| 720 minute winter | 45 | 540 | 6.730 | 1.430 | 10.5 | 7.6202 | 0.0000 | SURCHARGED |
| 720 minute winter | 46 | 540 | 6.731 | 0.931 | 5.4 | 1.6458 | 0.0000 | FLOOD RISK |
| 960 minute winter | 47 | 690 | 5.713 | 0.463 | 0.7 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 48 | 570 | 5.713 | 0.513 | 1.5 | 1.3066 | 0.0000 | OK |
| 720 minute winter | 49 | 540 | 5.313 | 0.563 | 0.7 | 0.0000 | 0.0000 | OK |
| 720 minute winter | 50 | 555 | 5.313 | 0.613 | 1.4 | 1.5599 | 0.0000 | OK |
| 4320 minute winter | 51 | 3000 | 4.857 | 0.557 | 4.2 | 2.7353 | 0.0000 | OK |
| 15 minute summer | 52 | 1 | 6.300 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute summer | 53 | 1 | 4.950 | 0.000 | 0.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 55 | 10 | 11.357 | 0.057 | 11.9 | 0.0897 | 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 | 38 | Weir | 41 | 24.5 | | | | |
| 720 minute winter | 39 | 16.000 | 40 | -0.3 | -0.012 | -0.007 | 1.4346 | |
| 720 minute winter | 40 | 16.001 | 41 | -0.7 | -0.024 | -0.009 | 0.0892 | |
| 720 minute winter | 41 | Weir | 45 | 1.7 | | | | |
| 720 minute winter | 41 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 42 | 17.000 | 43 | 22.3 | 1.466 | 0.235 | 0.6465 | |
| 720 minute winter | 43 | 17.001 | 45 | 2.4 | 0.543 | 0.046 | 0.3935 | |
| 720 minute winter | 44 | 18.000 | 45 | 5.3 | -0.009 | 0.002 | 49.6913 | |
| 720 minute winter | 45 | 1.016 | 46 | 5.4 | 0.432 | 0.042 | 0.2601 | |
| 720 minute winter | 45 | Infiltration | | 0.6 | | | | |
| 720 minute winter | 46 | 1.017 | 48 | 1.4 | 0.529 | 0.014 | 0.0297 | |
| 960 minute winter | 47 | 19.000 | 48 | -0.7 | -0.009 | -0.001 | 8.6078 | |
| 720 minute winter | 48 | 1.018 | 50 | 1.3 | 1.271 | 0.003 | 0.0034 | |
| 720 minute winter | 48 | Infiltration | | 0.1 | | | | |
| 720 minute winter | 49 | 20.000 | 50 | -0.7 | -0.008 | -0.001 | 5.2533 | |
| 720 minute winter | 50 | 1.019 | 51 | 1.2 | 1.211 | 0.003 | 0.0044 | |
| 720 minute winter | 50 | Infiltration | | 0.1 | | | | |
| 720 minute winter | 50 | Infiltration | | 0.1 | | | | |
| 4320 minute winter | 51 | 1.020 | 81 | -3.1 | -0.005 | -0.003 | 41.5415 | |
| 15 minute summer | 52 | 30.000 | 53 | 0.0 | 0.000 | 0.000 | 0.0004 | |
| 15 minute summer | 53 | Weir | 81 | 0.0 | | | | |
| 15 minute summer | 53 | Infiltration | | 0.0 | | | | |
| 15 minute winter | 55 | 21.000 | 56 | 11.8 | 1.204 | 0.140 | 0.3428 | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 56 | 10 | 10.476 | 0.076 | 26.5 | 0.1293 | 0.0000 | OK |
| 15 minute winter | 57 | 11 | 9.230 | 0.130 | 28.4 | 0.1605 | 0.0000 | OK |
| 15 minute winter | 58 | 11 | 9.131 | 0.131 | 28.1 | 0.1483 | 0.0000 | OK |
| 30 minute winter | 59 | 21 | 9.039 | 0.589 | 9.7 | 0.0000 | 0.0000 | OK |
| 30 minute winter | 60 | 20 | 9.039 | 0.639 | 24.0 | 1.6250 | 0.0000 | OK |
| 30 minute winter | 61 | 21 | 8.888 | 0.088 | 20.8 | 0.0990 | 0.0000 | OK |
| 240 minute winter | 62 | 148 | 8.631 | 0.481 | 3.9 | 0.0000 | 0.0000 | OK |
| 240 minute winter | 63 | 148 | 8.631 | 0.531 | 7.3 | 1.3507 | 0.0000 | OK |
| 240 minute winter | 64 | 148 | 8.187 | 0.037 | 5.7 | 0.0415 | 0.0000 | OK |
| 15 minute winter | 65 | 10 | 8.080 | 0.080 | 20.9 | 0.1496 | 0.0000 | OK |
| 360 minute winter | 66 | 272 | 7.951 | 0.651 | 4.7 | 0.8447 | 0.0000 | SURCHARGED |
| 360 minute winter | 67 | 272 | 7.951 | 0.701 | 4.5 | 1.7834 | 0.0000 | SURCHARGED |
| 360 minute winter | 68 | 272 | 7.951 | 0.751 | 9.8 | 2.0262 | 0.0000 | OK |
| 360 minute winter | 69 | 272 | 7.950 | 1.250 | 5.0 | 0.0000 | 0.0000 | FLOOD RISK |
| 360 minute winter | 70 | 272 | 7.950 | 1.350 | 12.1 | 6.6274 | 0.0000 | SURCHARGED |
| 15 minute winter | 71 | 10 | 8.906 | 0.122 | 24.7 | 0.2024 | 0.0000 | OK |
| 15 minute winter | 72 | 10 | 8.460 | 0.060 | 7.3 | 0.0821 | 0.0000 | OK |
| 15 minute winter | 73 | 10 | 8.352 | 0.084 | 36.9 | 0.1133 | 0.0000 | OK |
| 360 minute winter | 74 | 272 | 7.950 | 0.355 | 8.2 | 0.5620 | 0.0000 | SURCHARGED |
| 360 minute winter | 75 | 272 | 7.950 | 1.150 | 10.6 | 1.8577 | 0.0000 | FLOOD RISK |
| 15 minute winter | 76 | 10 | 6.530 | 0.030 | 2.5 | 0.0459 | 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 | 56 | 21.001 | 57 | 26.1 | 1.480 | 0.248 | 0.5648 | |
| 15 minute winter | 57 | 21.002 | 58 | 28.1 | 1.179 | 0.515 | 0.2158 | |
| 15 minute winter | 58 | 21.003 | 60 | 28.3 | 1.304 | 0.491 | 0.0883 | |
| 30 minute winter | 59 | 22.000 | 60 | -9.7 | -0.081 | -0.010 | 7.8962 | |
| 30 minute winter | 60 | 21.004 | 61 | 20.8 | 1.459 | 0.263 | 0.0930 | |
| 30 minute winter | 61 | 21.005 | 63 | 21.1 | 1.576 | 0.271 | 0.1202 | |
| 240 minute winter | 62 | 23.000 | 63 | -3.9 | -0.112 | -0.006 | 16.2138 | |
| 240 minute winter | 63 | 21.006 | 64 | 5.7 | 1.536 | 0.039 | 0.0216 | |
| 240 minute winter | 64 | 21.007 | 68 | 5.7 | 0.841 | 0.058 | 0.1420 | |
| 15 minute winter | 65 | 24.000 | 66 | 20.7 | 1.142 | 0.275 | 0.7904 | |
| 360 minute winter | 66 | 24.001 | 67 | 4.5 | 0.442 | 0.094 | 0.1409 | |
| 360 minute winter | 67 | 24.002 | 68 | 4.4 | 0.066 | 0.007 | 21.6466 | |
| 360 minute winter | 68 | 21.008 | 70 | 9.9 | 1.072 | 0.170 | 0.6885 | |
| 360 minute winter | 69 | 25.000 | 70 | -5.0 | -0.008 | -0.002 | 29.5278 | |
| 360 minute winter | 70 | 21.009 | 75 | 5.2 | -0.181 | 0.038 | 0.2327 | |
| 15 minute winter | 71 | 26.000 | 73 | 24.0 | 1.364 | 0.519 | 1.1578 | |
| 15 minute winter | 72 | 27.000 | 73 | 7.2 | 0.655 | 0.160 | 0.1935 | |
| 15 minute winter | 73 | 26.001 | 74 | 36.7 | 2.056 | 0.293 | 0.2229 | |
| 360 minute winter | 74 | 26.002 | 75 | 8.2 | 0.298 | 0.109 | 1.5077 | |
| 360 minute winter | 75 | 21.010 | 77 | 6.3 | 1.582 | 0.052 | 0.0494 | |
| 15 minute winter | 76 | 28.000 | 77 | 2.4 | 0.754 | 0.038 | 0.0790 | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | 77 | 10 | 5.868 | 0.068 | 15.8 | 0.1140 | 0.0000 | OK |
| 15 minute winter | 78 | 10 | 5.658 | 0.058 | 12.6 | 0.0939 | 0.0000 | OK |
| 4320 minute winter | 79 | 3000 | 4.857 | 0.307 | 5.7 | 0.4040 | 0.0000 | SURCHARGED |
| 4320 minute winter | 80 | 3000 | 4.857 | 0.257 | 5.1 | 0.5172 | 0.0000 | OK |
| 4320 minute winter | 81 | 3000 | 4.857 | 0.607 | 7.5 | 2.9808 | 0.0000 | SURCHARGED |
| 4320 minute winter | 82 | 3060 | 4.786 | 1.086 | 2.7 | 0.1423 | 0.0000 | FLOOD RISK |
| 4320 minute winter | 83 | 3000 | 4.786 | 1.106 | 6.6 | 5.4276 | 0.0000 | SURCHARGED |
| 4320 minute winter | 84 | 3000 | 4.787 | 0.387 | 0.4 | 0.1959 | 0.0000 | SURCHARGED |
| 4320 minute winter | 85 | 3060 | 4.787 | 0.637 | 0.8 | 0.8362 | 0.0000 | SURCHARGED |
| 4320 minute winter | 86 | 3000 | 4.788 | 0.688 | 0.9 | 0.7779 | 0.0000 | SURCHARGED |
| 4320 minute winter | 87 | 3060 | 4.789 | 1.139 | 10.0 | 2.8993 | 0.0000 | SURCHARGED |
| 4320 minute winter | 88 | 3000 | 4.786 | 1.086 | 1.7 | 0.0000 | 0.0000 | FLOOD RISK |
| 4320 minute winter | 89 | 3000 | 4.787 | 1.157 | 24.0 | 0.0000 | 0.0000 | FLOOD RISK |
| 4320 minute winter | 90 | 3000 | 4.786 | 1.136 | 2.8 | 0.0000 | 0.0000 | FLOOD RISK |
| 4320 minute winter | 91 | 3060 | 4.786 | 1.186 | 20.3 | 0.0000 | 0.0000 | FLOOD RISK |
| 4320 minute winter | 91_OUT | 3000 | 4.785 | 0.885 | 2.7 | 1.0014 | 0.0000 | OK |
| 15 minute winter | 93 | 10 | 6.515 | 0.115 | 39.4 | 0.2864 | 0.0000 | OK |
| 15 minute winter | 94 | 10 | 5.490 | 0.132 | 27.2 | 0.2536 | 0.0000 | OK |
| 15 minute winter | 95 | 12 | 5.352 | 0.249 | 72.7 | 0.3498 | 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 | 77 | 21.011 | 80 | 15.7 | 0.971 | 0.199 | 1.0276 | |
| 15 minute winter | 78 | 29.000 | 79 | 12.4 | 0.615 | 0.147 | 0.8059 | |
| 4320 minute winter | 79 | 21.013 | 81 | 7.5 | 0.616 | 0.075 | 0.4281 | |
| 4320 minute winter | 80 | 21.012 | 79 | 5.1 | 0.682 | 0.054 | 0.4569 | |
| 4320 minute winter | 81 | 1.021 | 83 | 6.6 | 0.829 | 0.032 | 1.2835 | |
| 4320 minute winter | 81 | Infiltration | | 0.5 | | | | |
| 4320 minute winter | 82 | 31.000 | 83 | -2.7 | -0.003 | -0.003 | 71.0187 | |
| 4320 minute winter | 83 | 1.022 | 87 | 7.6 | 0.077 | 0.014 | 29.0882 | |
| 4320 minute winter | 83 | Infiltration | | 0.9 | | | | |
| 4320 minute winter | 84 | 32.000 | 86 | 0.6 | 0.346 | 0.011 | 1.2500 | |
| 4320 minute winter | 85 | 33.000 | 86 | -0.7 | 0.200 | -0.017 | 0.3349 | |
| 4320 minute winter | 86 | 32.001 | 87 | 1.6 | 0.466 | 0.022 | 0.1112 | |
| 4320 minute winter | 87 | 1.023 | 89 | 12.1 | 0.042 | 0.008 | 2.2177 | |
| 4320 minute winter | 87 | Infiltration | | 0.4 | | | | |
| 4320 minute winter | 88 | 34.000 | 89 | 4.7 | 0.003 | 0.003 | 57.6729 | |
| 4320 minute winter | 89 | 1.024 | 91 | 20.3 | 0.023 | 0.011 | 2.7159 | |
| 4320 minute winter | 89 | Infiltration | | 0.7 | | | | |
| 4320 minute winter | 90 | 35.000 | 91 | 4.1 | 0.003 | 0.004 | 99.6045 | |
| 4320 minute winter | 91 | 1.025 | 91_OUT | 2.7 | 0.038 | 0.012 | 0.1873 | |
| 4320 minute winter | 91 | Infiltration | | 1.2 | | | | |
| 4320 minute winter | 91_OUT | Pump | | 0.0 | | | | 0.0 |
| 15 minute winter | 93 | 36.001 | 95 | 38.6 | 1.510 | 0.526 | 1.9309 | |
| 15 minute winter | 94 | 37.000 | 95 | 27.0 | 0.959 | 0.657 | 1.2648 | |
| 15 minute winter | 95 | 36.002 | 96 | 64.8 | 1.665 | 0.818 | 1.7330 | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | 96 | 12 | 4.672 | 0.572 | 67.4 | 0.7077 | 0.0000 | SURCHARGED |
| 15 minute winter | 97 | 10 | 5.379 | 0.050 | 9.1 | 0.0749 | 0.0000 | OK |
| 15 minute winter | 98 | 11 | 4.867 | 0.065 | 9.3 | 0.0744 | 0.0000 | OK |
| 15 minute summer | 99 | 12 | 4.341 | 0.341 | 74.3 | 0.3856 | 0.0000 | SURCHARGED |
| 15 minute winter | 100 | 10 | 5.944 | 0.044 | 21.3 | 0.0912 | 0.0000 | OK |
| 15 minute winter | 101 | 13 | 5.698 | 0.198 | 20.9 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 102 | 13 | 5.582 | 0.182 | 14.5 | 0.0000 | 0.0000 | OK |
| 15 minute winter | 103 | 13 | 4.632 | 0.182 | 14.4 | 0.0000 | 0.0000 | OK |
| 30 minute winter | 104 | 22 | 4.204 | 0.654 | 24.9 | 0.0523 | 0.0000 | OK |
| 30 minute winter | 105 | 22 | 4.204 | 0.704 | 53.4 | 3.4550 | 0.0000 | SURCHARGED |
| 30 minute winter | 106 | 22 | 4.204 | 0.754 | 81.4 | 3.6995 | 0.0000 | OK |
| 360 minute winter | 107 | 256 | 4.148 | 0.748 | 19.8 | 3.6715 | 0.0000 | SURCHARGED |
| 360 minute winter | 108 | 256 | 4.148 | 0.135 | 0.3 | 0.1525 | 0.0000 | OK |
| 360 minute winter | 109 | 256 | 4.148 | 0.248 | 7.3 | 0.6410 | 0.0000 | SURCHARGED |
| 360 minute winter | 110 | 256 | 4.148 | 0.798 | 24.1 | 3.9166 | 0.0000 | SURCHARGED |
| 360 minute winter | 111 | 256 | 4.148 | 0.848 | 25.4 | 0.0000 | 0.0000 | SURCHARGED |
| 360 minute winter | 112 | 256 | 4.148 | 0.848 | 12.7 | 0.0059 | 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 | 96 | 36.003 | 99 | 66.1 | 1.662 | 1.582 | 0.6133 | |
| 15 minute winter | 97 | 38.000 | 98 | 9.0 | 1.424 | 0.098 | 0.0550 | |
| 15 minute winter | 98 | 38.001 | 99 | 9.1 | 0.868 | 0.185 | 1.1687 | |
| 15 minute summer | 99 | 36.004 | 106 | 73.6 | 1.851 | 1.292 | 0.1635 | |
| 15 minute winter | 100 | 39.000 | 101 | 20.9 | 0.476 | 0.005 | 3.8033 | |
| 15 minute winter | 101 | Weir | 102 | 14.5 | | | | |
| 15 minute winter | 101 | Infiltration | | 0.5 | | | | |
| 15 minute winter | 102 | Weir | 103 | 14.4 | | | | |
| 15 minute winter | 102 | Infiltration | | 0.2 | | | | |
| 15 minute winter | 103 | Weir | 106 | 14.4 | | | | |
| 15 minute winter | 103 | Infiltration | | 0.0 | | | | |
| 30 minute winter | 104 | 40.000 | 105 | -23.0 | -0.110 | -0.011 | 15.4104 | |
| 30 minute winter | 105 | 40.001 | 106 | -53.4 | -0.149 | -0.018 | 8.0109 | |
| 30 minute winter | 105 | Infiltration | | 0.8 | | | | |
| 30 minute winter | 106 | 36.005 | 107 | 70.0 | 1.209 | 0.985 | 0.6980 | |
| 30 minute winter | 106 | Infiltration | | 0.4 | | | | |
| 360 minute winter | 107 | 36.006 | 110 | 19.9 | 0.032 | 0.011 | 24.0979 | |
| 360 minute winter | 108 | 41.000 | 109 | -0.3 | -0.027 | -0.005 | 0.3385 | |
| 360 minute winter | 109 | 41.001 | 110 | 7.1 | 0.960 | 0.115 | 0.2813 | |
| 360 minute winter | 110 | 36.007 | 111 | 21.3 | 0.115 | 0.018 | 7.4245 | |
| 360 minute winter | 110 | Infiltration | | 1.2 | | | | |
| 360 minute winter | 111 | 36.008 | 115 | 25.1 | 0.151 | 0.047 | 2.6704 | |
| 360 minute winter | 111 | Infiltration | | 0.4 | | | | |
| 360 minute winter | 111 | Infiltration | | 0.4 | | | | |
| 360 minute winter | 112 | 43.000 | 113 | -9.7 | -0.011 | -0.009 | 8.4172 | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | 113 | 256 | 4.148 | 0.848 | 12.0 | 0.0000 | 0.0000 | SURCHARGED |
| 360 minute winter | 114 | 256 | 4.148 | 0.848 | 30.0 | 0.0000 | 0.0000 | SURCHARGED |
| 360 minute winter | 115 | 256 | 4.148 | 0.848 | 25.1 | 0.0000 | 0.0000 | SURCHARGED |
| 360 minute winter | 117 | 256 | 4.148 | 0.848 | 12.6 | 0.0000 | 0.0000 | SURCHARGED |
| 360 minute winter | 119 | 256 | 4.148 | 0.848 | 37.5 | 2.1575 | 0.0000 | SURCHARGED |
| 360 minute winter | 120 | 256 | 4.145 | 1.545 | 16.2 | 0.0000 | 0.0000 | SURCHARGED |
| 360 minute winter | 121 | 256 | 4.148 | 0.348 | 4.5 | 0.7027 | 0.0000 | SURCHARGED |
| 360 minute winter | 122 | 256 | 4.146 | 0.796 | 2.0 | 0.9002 | 0.0000 | SURCHARGED |
| 360 minute winter | 123 | 256 | 4.145 | 1.595 | 28.2 | 0.0000 | 0.0000 | FLOOD RISK |
| 960 minute winter | 124 | 750 | 3.626 | 1.076 | 7.7 | 0.2099 | 0.0000 | SURCHARGED |
| 960 minute winter | 125 | 735 | 3.626 | 1.126 | 13.4 | 2.8667 | 0.0000 | SURCHARGED |
| 960 minute winter | 126 | 735 | 3.626 | 1.076 | 5.1 | 0.0000 | 0.0000 | SURCHARGED |
| 960 minute winter | 127 | 750 | 3.626 | 1.126 | 9.1 | 0.0000 | 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) |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | 112 | 44.000 | 117 | 12.6 | 0.030 | 0.024 | 9.5995 | |
| 360 minute winter | 113 | 43.001 | 114 | 29.7 | 0.035 | 0.028 | 8.5948 | |
| 360 minute winter | 113 | 45.000 | 119 | 7.4 | -0.019 | 0.014 | 8.2355 | |
| 360 minute winter | 113 | Infiltration | | 0.4 | | | | |
| 360 minute winter | 114 | 43.002 | 115 | -13.8 | -0.050 | -0.013 | 15.2988 | |
| 360 minute winter | 114 | Infiltration | | 0.4 | | | | |
| 360 minute winter | 115 | 36.009 | 119 | 14.8 | 0.095 | 0.028 | 1.6414 | |
| 360 minute winter | 115 | Infiltration | | 0.1 | | | | |
| 360 minute winter | 115 | Infiltration | | 0.8 | | | | |
| 360 minute winter | 117 | 44.001 | 119 | 18.8 | 0.072 | 0.036 | 1.5810 | |
| 360 minute winter | 117 | Infiltration | | 0.5 | | | | |
| 360 minute winter | 119 | 36.010 | 123 | 28.2 | 2.364 | 0.239 | 0.5840 | |
| 360 minute winter | 119 | Infiltration | | 0.1 | | | | |
| 360 minute winter | 119 | Infiltration | | 0.1 | | | | |
| 360 minute winter | 119 | Infiltration | | 0.4 | | | | |
| 360 minute winter | 120 | 46.000 | 123 | -16.2 | -0.075 | -0.022 | 36.3129 | |
| 360 minute winter | 121 | 42.000 | 111 | 5.2 | 0.884 | 0.077 | 0.2378 | |
| 360 minute winter | 122 | 47.000 | 123 | -2.0 | -0.052 | -0.028 | 0.4155 | |
| 360 minute winter | 123 | 36.011 | 125 | 9.8 | 0.872 | 0.074 | 0.2496 | |
| 360 minute winter | 123 | Infiltration | | 1.8 | | | | |
| 960 minute winter | 124 | 48.000 | 125 | 7.8 | 0.036 | 0.007 | 10.2319 | |
| 960 minute winter | 125 | 36.012 | 127 | 5.2 | 0.853 | 0.042 | 0.2851 | |
| 960 minute winter | 125 | Infiltration | | 0.5 | | | | |
| 960 minute winter | 126 | 49.000 | 127 | -5.1 | -0.011 | -0.004 | 9.3948 | |
| 960 minute winter | 127 | 36.013 | 129 | 5.0 | 0.900 | 0.036 | 0.2301 | |

**Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 89.36%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | 128 | 750 | 3.628 | 1.128 | 5.3 | 0.0000 | 0.0000 | SURCHARGED |
| 960 minute winter | 129 | 735 | 3.627 | 1.177 | 7.8 | 2.9954 | 0.0000 | SURCHARGED |
| 960 minute winter | 130 | 750 | 3.627 | 1.177 | 4.9 | 0.0000 | 0.0000 | SURCHARGED |
| 960 minute winter | 131 | 750 | 3.627 | 1.227 | 10.7 | 3.1224 | 0.0000 | SURCHARGED |
| 960 minute winter | 131_OUT | 750 | 3.627 | 0.777 | 3.3 | 0.8785 | 0.0000 | OK |
| 15 minute winter | 92 | 10 | 6.618 | 0.018 | 1.1 | 0.0215 | 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 | 127 | Infiltration | | 0.5 | | | | |
| 960 minute winter | 128 | 50.000 | 129 | -4.6 | 0.008 | -0.004 | 9.3088 | |
| 960 minute winter | 129 | 36.014 | 131 | 10.7 | 0.786 | 0.086 | 0.2820 | |
| 960 minute winter | 129 | Infiltration | | 0.5 | | | | |
| 960 minute winter | 130 | 51.000 | 131 | -4.9 | -0.101 | -0.005 | 16.5945 | |
| 960 minute winter | 131 | 36.015 | 131_OUT | 3.3 | 0.384 | 0.029 | 0.3207 | |
| 960 minute winter | 131 | Infiltration | | 0.8 | | | | |
| 960 minute winter | 131_OUT | Pump | | 0.0 | | | | 0.0 |
| 15 minute winter | 92 | 36.000 | 93 | 1.1 | 0.109 | 0.014 | 0.0947 | |

# APPENDIX B – FOUL WATER CALCULATIONS

# FOUL SEWER DESIGN DETAILS

## 1. INTRODUCTION

AKM Design have been retained by Marshall Yards Development Ltd to develop a design for a foul sewage pumping station (FPS) to serve the proposed Oranmore LRD residential development consisting of 171 residential units with a creche. Effluent from the development will be pumped through a 900m long 100mm ID PE rising main to discharge via gravity into an existing manhole adjacent to a nearby development. This appendix details the design calculations used and is intended to be read with accompanying design drawings.

## 2. CAPACITY

The pump station will be designed to accommodate flows from 171 residential units and a creche with an expected occupancy of 55 staff and pupils.

*Dry Weather Flow*
171 units with 2.7 ppl/unit @ 150 l/p/day = 405 l/unit/day + 10% infiltration
= 446 l/unit/day Dry Weather Flow
171 units @ 450 = 79,950 l/day residential DWF

1 creche with 55 occupants @ 50l/p/day
= 2,750 l/day

Total DWF = 82,700 l/d = 0.96 l/s

*Peak Flow*
Peak Flow = 6 x DWF

6 x 0.96 = 5.74 l/s

## 3. STORAGE

The storage required will be:

Units 1-171 @ 24hr (450 l/d) = 77$m^3$
Creche 55ppl @ 24hr (55 x 50 l/p) = 3 $m^3$

Total Storage Required = 80$m^3$

This storage requirement will be met by using a single precast concrete storage tank and utilising an additional storage within the wet well.

## 4. VELOCITY

Irish Water Code of Practice dictates that the range of flow velocity within a rising main should be between 0.75m/sec and 1.8m/sec.

Flow, Q = AV
Where A = cross sectional area = 0.008m2
V = velocity

Q = 5.74 l/s established in Section 2 above = 0.006 m3/s
Therefore V = 0.75m/s

## 5. SEPTICITY

Irish Water Code of Practice dictates that the maximum retention time in a rising main is to be 6 hours.

Total Daily Flow (@DWF) = 82.7$m^3$/day
Rising Main Volume, 900m of 100mm = 7.01 $m^3$
Wet well sump = 2.84 $m^3$
Empties/day = 8.3 times
Therefore, average retention time = 173 minutes

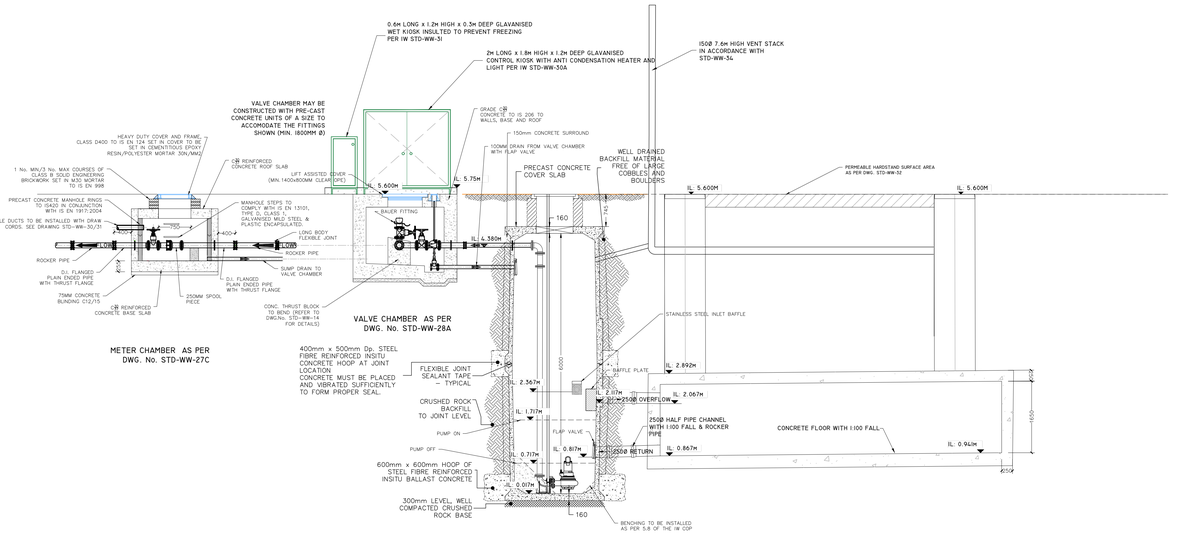
## 6. STARTS PER HOUR

Irish Water Code of Practice dictates that pump starts per hour generally not exceed 10.

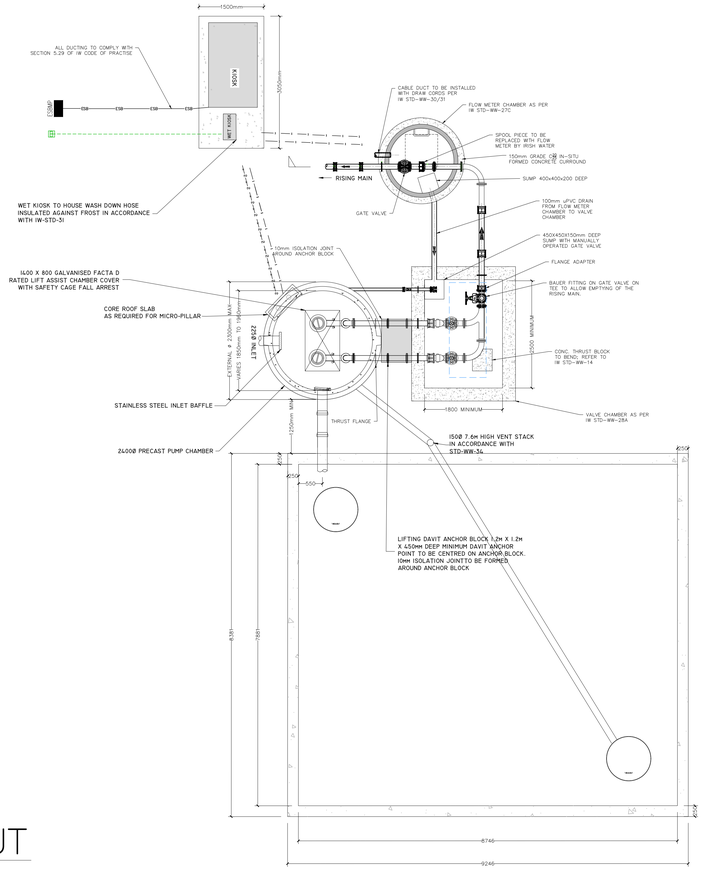
Wet well working volume = 2.84 $m^3$
Inflow @ DWF = 0.96 l/s
Fill time = 49 min
Run time @ 5.74 l/s = 8.25 min
Cycle time @ DWF = 57.25 min

Inflow @ Peak Flow = 5.74 l/s
Fill time = Run time = 8.25 min
Cycle time @ Peak Flow = 16.5 min

Therefore, starts per hour between = 1 and 4 @ DWF and Peak Flow respectively




SECTION VIEW
SCALE 1:50




PLAN VIEW
SCALE 1:50

LEGEND

- 1-WAY ESB DUCT (125mm)
- 1-WAY DUCT (100mm)
- 2-WAY DUCT (100mm)
- ESB/MP — ESB MINI-PILLAR
- 25mm WATERMAIN CONNECTION AND BOUNDARY BOX
- 250mm / 300mm C30/37 CONCRETE HARDSTANDING AREA REINFORCED WITH A393 MESH TOP AND BOTTOM ON 150mm GL. BUR

# PROPOSED FOUL PUMP STATION LAYOUT

SCALE 1:50

# NOTES



A. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND SPECIFICATION.

B. ALL DIMENSIONS IN mm UNLESS NOTED.

C. DO NOT SCALE DIMENSIONS.

D. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. DISCREPANCIES SHALL BE REPORTED TO THIS OFFICE IN WRITING.

1. FOUL PUMPING STATION, TO COMPLY WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE.
2. PUMPS TO BE INSTALLED TO MANUFACTURERS DETAILS & SPECIFICATION
3. PUMP MANUFACTURER TO SUPPLY DETAILS OF STANDARD ANNUAL MAINTENANCE FOR PUMPS
4. PUMP MANUFACTURER TO SUPPLY DETAILS OF RECOMMENDED SPARE PARTS FOR 20 YEARS OPERATION
5. PUMPING FACILITY TO BE SUITABLY LANDSCAPED TO ARCHITECTS DETAILS.
6. GALVANISED STEEL ACCESS COVER TO BE PROVIDED ON ALL CHAMBERS WITH NON-SLIP SURFACE. ALL COVERS TO BE LOCKABLE. CHAMBER COVERS TO COMPLY WITH BS EN 124.
7. DAVITS & SOCKETS TO BE GALVANISED.
8. LIFTING DAVITS, TACKLE AND SOCKETS SHOULD BE RATED TO LIFT TWICE THE WEIGHT OF EACH PUMP UNIT WITH A MINIMUM RATING OF 500kg, SAFE WORKING LOAD.
9. ALL METAL EQUIPMENT ON THE PUMP STATION SITE TO BE BONDED TO EARTH. EARTH ROD WITH INSPECTION PIT TO BE INSTALLED.
10. MINIMUM PUMP CUT-OUT LEVEL TO BE ABOVE THE TOP OF THE PUMP MOTORS.
11. LEVEL DETECTION TO BE UNLTRASONIC AND HAVE SUITABLE CONNECTIONS TO STANDARD LOGGERS /SCADA SYSTEMS.
12. VENT STACKS TO BE FITTED WITH ANTI-BIRD COWLS.
13. CONTINUOUS CONCRETE FOOTPATH TO BE PROVIDED AROUND KIOSKS AND PUMP STATION.
14. ALL DUCTING FROM PUMP CHAMBER TO BE SEALED AIRTIGHT.
15. ELECTRICAL REQUIREMENTS TO MEET IRISH WATER CODE OF PRACTICE FOR WASTEWATER.
16. TELEMETRY TO BE PROVIDED FOR PUMPING STATION TO MEET IRISH WATER REQUIREMENTS.
17. PUMPING STATION TO HAVE REMOTE/ALARM MONITORING TO MEET IRISH WATER REQUIREMENTS.
18. PUMPS TO BE DUTY/STANDBY SUBMERSIBLE SUITABLE FOR RAW, UNSCREENED DOMESTIC SEWAGE.
19. PUMPS TO BE MOUNTED ON A CAST IRON COUPLING/DUCK-FOOT PEDESTAL.
20. ALL PIPE WORK AND VALVES TO BE DUCTILE IRON TO IS EN 598 SUITABLE FOR USE WITH SEWERAGE WITH PN-16 FLANGES TO BS EN 1092-1.
21. VALVE CHAMBER TO INCLUDE FEMALE BAUER CONNECTION AND SLUICE VALVE ON A TEE FOR PUMPING DOWN THE PUMP STATION.
22. PUDDLE FLANGES TO BE USED TO ENSURE A SEAL BETWEEN PIPES AND IN-SITU CONCRETE WALL.
23. ALL IN-SITU CONCRETE TO BE C30/37 TO IS EN 206.
24. ALL OPENING TO BE CORED AND SEALED WITH FORSHEDA F910 WALL SEALS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS OR SIMILAR APPROVED PRODUCT.

VALVE AND METER CHAMBER EQUIPMENT

1. NON RETURN VALVE
2. SLUICE VALVE WITH HAND WHEEL
3. SLUICE VALVE ON VERTICAL LINE WITH BAUER CONNECTION
4. FREE FLOW METER

| REV | DATE | DESCRIPTION |
|---|---|---|

**FOR INFORMATION**



PREPARED BY

**AKM DESIGN**
Chartered Consulting Engineers
Unit 6, Kingswood Business Centre,
Citywest Business Campus, Dublin 24
T: +353 1 479 6234 E: info@akmdesign.ie
Structural I Civil I Building I Development Consultants I Sustainable Design

CLIENT
MARSHALL YARDS DEVELOPMENT COMPANY LTD.

PROJECT TITLE
CARTRON GALWAY

DRAWING TITLE
PROPOSED FOUL PUMPING STATION

| SCALES: | DRAWN: | APPROVED: |
|---|---|---|
| 1:50 @ A1 | AB | CK |
| | DATE: 04/24 | DATE: 04/24 |

| DOCUMENT NUMBER: | STAGE: |
|---|---|
| 23011-AKM-XXXX-XX-DR-C01-420001 | S2 |

| PROJECT CODE: | SEQUENCE NUMBER: | AKM JOB NUMBER: |
|---|---|---|
| 23011 | 420001 | 23011 |
| DEPARTMENT CODE: | ROLES CODE: | DOCUMENT CODE: |
| E | C01 | DR |
| ORGANISATION CODE: | LEVELS & LOCATION CODE: | REVISION: |
| AKM | XX | 00 |

# APPENDIX C – TOPOGRAPHICAL SURVEY

LAND SURVEYS
22 Mellifont Avenue, Dun Laoghaire, Co. Dublin.
Ph: 2805212 Fax: 2302535 info@landsurveys.ie

Site at:

# Cartron, Oranmore, Co. Galway

Client:

Marshall Yards Development Company Ltd.

| | |
|---|---|
| Scale: | 1:500 (A1) |
| Contour: | 0.5m Interval |
| Datum: | OSi Malin Head |
| Issued: | 04.04.2023 |
| Ref: | D17357-F2D |


Sheet 1 of 4 (A1)

## NOTE:

Portion of Ordnance Survey Detail Shown Grey Digitally Reproduced under Ordnance Survey Ireland Licence : CYAL50251205 © Government of Ireland.

Manhole Pipe Sizes Types Connections and Directions are Based on Visual Inspection Only and are Subject to Verification/Tracing.

Cartron

N

NOTE:

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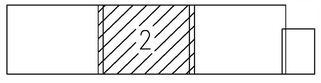
Manhole Pipe Sizes Types Connections and Directions are Based on Visual Inspection Only and are Subject to Verification/Tracing.

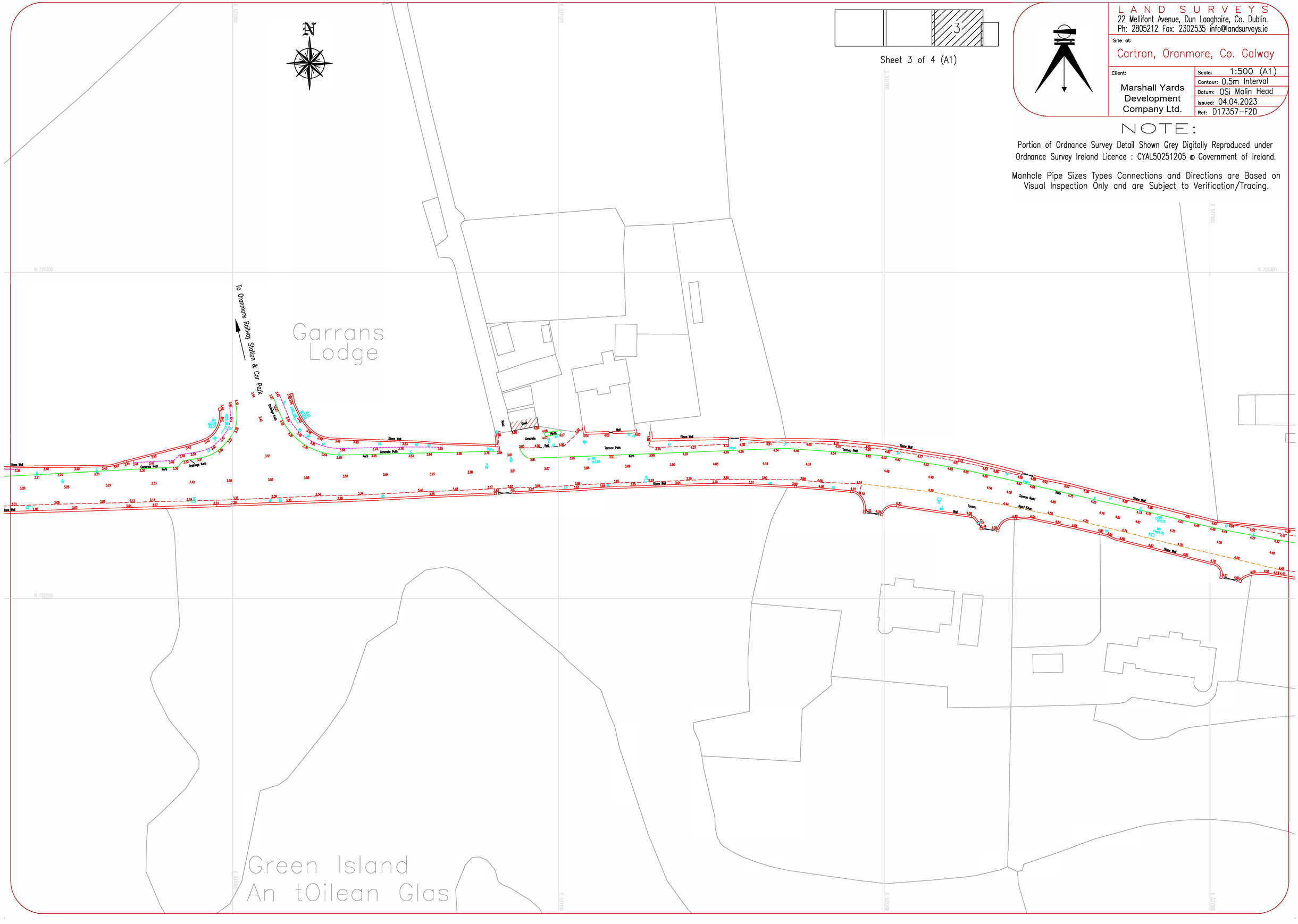

LAND SURVEYS
22 Mellifont Avenue, Dun Laoghaire, Co. Dublin.
Ph: 2805212 Fax: 2302535 info@landsurveys.ie


Site at:
Cartron, Oranmore, Co. Galway

Client:
Marshall Yards Development Company Ltd.

| | |
|---|---|
| Scale: | 1:500 (A1) |
| Contour: | 0.5m Interval |
| Datum: | OSi Malin Head |
| Issued: | 04.04.2023 |
| Ref: | D17357-F2D |









Sheet 3 of 4 (A1)


LAND SURVEYS
22 Mellifont Avenue, Dun Laoghaire, Co. Dublin.
Ph: 2805212 Fax: 2302535 info@landsurveys.ie


Site at:

Cartron, Oranmore, Co. Galway

Client:

Marshall Yards Development Company Ltd.

| | |
|---|---|
| Scale: | 1:500 (A1) |
| Contour: | 0.5m Interval |
| Datum: | OSi Malin Head |
| Issued: | 04.04.2023 |
| Ref: | D17357-F2D |

NOTE:

Portion of Ordnance Survey Detail Shown Grey Digitally Reproduced under Ordnance Survey Ireland Licence : CYAL50251205 © Government of Ireland.

Manhole Pipe Sizes Types Connections and Directions are Based on Visual Inspection Only and are Subject to Verification/Tracing.

E 537400

N

An Inse Ghlas
Housing Estate

Wall
Concrete Path
Tarmac Path
Tarmac Road
Road Edge
Stone Wall
Kerb
Shed

N 725200

St.Mary's
Quay

NOTE:

Portion of Ordnance Survey Detail Shown Grey Digitally Reproduced under Ordnance Survey Ireland Licence : CYAL50251205 © Government of Ireland.

Manhole Pipe Sizes Types Connections and Directions are Based on Visual Inspection Only and are Subject to Verification/Tracing.

Sheet 4 of 4 (A3)


LAND SURVEYS
22 Mellifont Avenue, Dun Laoghaire, Co. Dublin.
Ph: 2805212 Fax: 2302535 info@landsurveys.ie

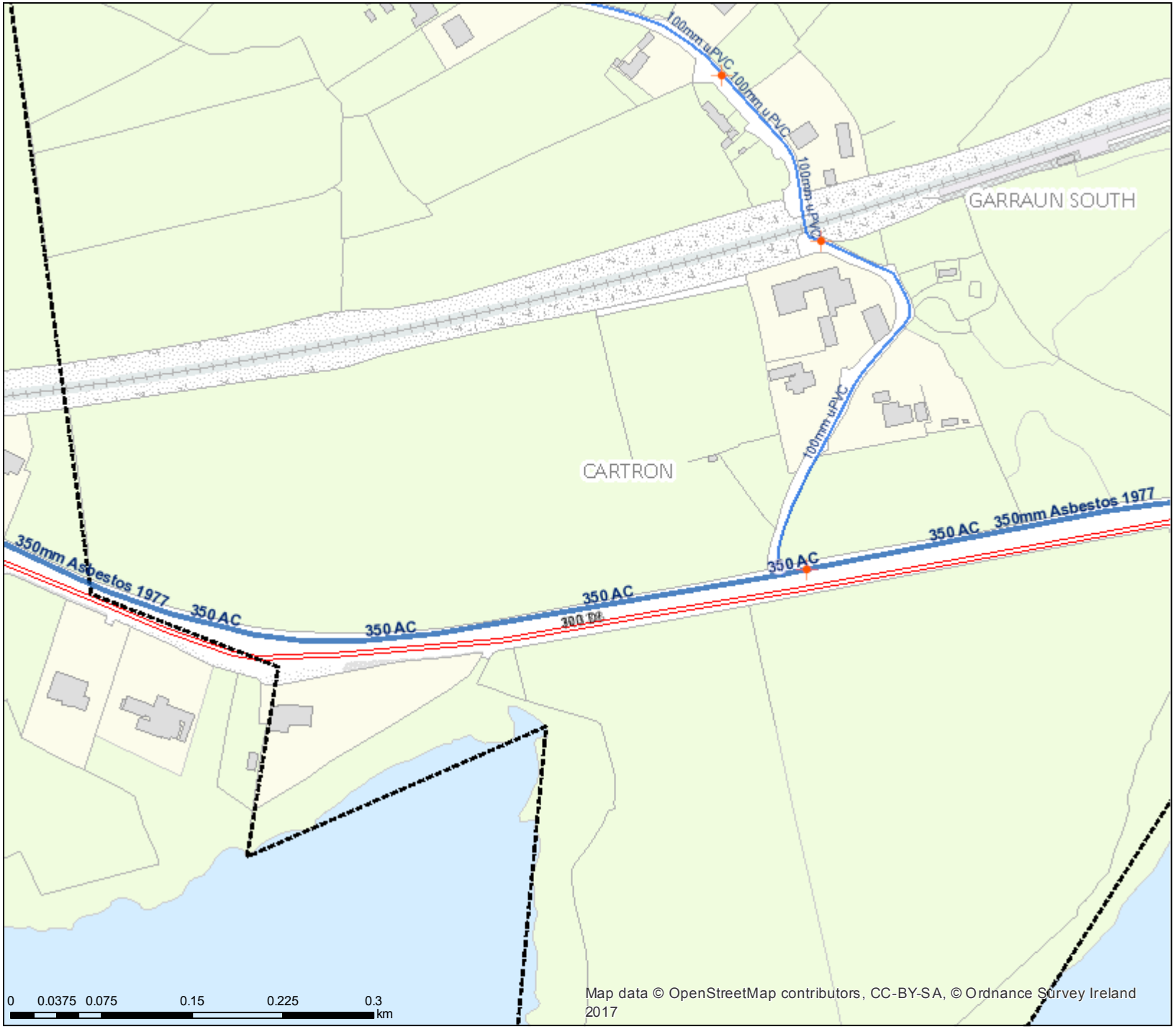

Site at:
Cartron, Oranmore, Co. Galway

Client:
Marshall Yards Development Company Ltd.

Scale: 1:500 (A3)
Contour: 0.5m Interval
Datum: OSi Malin Head
Issued: 04.04.2023
Ref: D17357-F2D

# APPENDIX D – UISCE EIREANN DOCUMENTS

# Irish Water Web Map




UISCE EIREANN : IRISH WATER

Print Date: 20/03/2023

Printed by:Irish Water



**Water Distribution Network**
- Water Treatment Plant
- Water Pump Station
- Storage Cell/Tower
- Dosing Point
- Meter Station
- Abstraction Point
- Telemetry Kiosk

**Reservoir**
- Potable
- Raw Water

**Water Distribution Mains**
- Irish Water
- Private

**Trunk Water Mains**
- Irish Water
- Private

**Water Lateral Lines**
- Irish Water
- Non IW
- Water Casings
- Water Abandoned Lines
- Boundary Meter
- Bulk/Check Meter
- Group Scheme
- Source Meter
- Waste Meter
- Unknown Meter ; Other Meter
- Non-Return
- PRV
- PSV
- Sluice Line Valve Open/Closed
- Butterfly Line Valve Open/Closed
- Sluice Boundary Valve Open/Closed
- Butterfly Boundary Valve Open/Closed
- Scour Valves
- Single Air Control Valve
- Double Air Control Valve
- Water Stop Valves
- Water Service Connections
- Water Distribution Chambers
- Water Network Junctions
- Pressure Monitoring Point
- Fire Hydrant
- Fire Hydrant/Washout

**Water Fittings**
- Cap
- Reducer
- Tap
- Other Fittings

**Sewer Foul Combined Network**
- Waste Water Treatment Plant
- Waste Water Pump station

**Sewer Mains Irish Water**
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow

**Sewer Mains Private**
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow
- Sewer Lateral Lines
- Sewer Casings

**Sewer Manholes**
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown

**Discharge Type**
- Outfall
- Overflow
- Soakaway
- Standard Outlet
- Other; Unknown

**Cleanout Type**
- Rodding Eye
- Flushing Structure
- Other; Unknown

**Sewer Inlets**
- Catchpit
- Gully
- Standard
- Other; Unknown

**Sewer Fittings**
- Vent/Col
- Other; Unknown

**Storm Water Network**

**Surface Water Mains**
- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private

**Inlet Type**
- Gully
- Standard
- Other; Unknown

**Storm Manholes**
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown
- Storm Culverts
- Storm Clean Outs
- Stormwater Chambers

**Discharge Type**
- Outfall
- Overflow
- Soakaway
- Other; Unknown

**Gas Networks Ireland**
- Transmission High Pressure Gasline
- Distribution Medium Pressure Gasline
- Distribution Low Pressure Gasline

**ESB Networks**

**ESB HV Lines**
- HV Underground
- HV Overhead
- HV Abandoned

**ESB MVLV Lines**
- MV Overhead Three Phase
- MV Overhead Single Phase
- LV Overhead Three Phase
- LV Overhead Single Phase
- MVLV Underground
- Abandoned

**Non Service Categories**
- Proposed
- Under Construction
- Out of Service
- Decommissioned

**Water Non Service Assets**
- Water Point Feature
- Water Pipe
- Water Structure

**Waste Non Service Assets**
- Waste Point Feature
- Sewer
- Waste Structure

# CONFIRMATION OF FEASIBILITY

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

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

www.water.ie

Cathal Kennedy

Unit 6
Kingswood Business Centre
Citywest Business Campus
Dublin 24
D24 A068
Ireland

27 April 2023

**Our Ref: CDS23001839 Pre-Connection Enquiry**
**R338, Coast Rd, Oranmore, Galway**

Dear Applicant/Agent,

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

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 160 unit(s) at R338, Coast Rd, Oranmore, 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 Irish Water
-
- **Wastewater Connection** - Feasible subject to upgrades.

- From our records, the nearest connection point to the network for this development is located circ. 900m to the east of the site. Please confirm full details of the proposed connection point (including long sections) at connection application stage.
- Developments should only pump directly to the Irish Water wastewater network where a gravity connection is not possible due to topography and existing network levels. Irish Water require the foul sewer network to be extended by gravity for as long as levels will permit to reduce the rising main distance. The minimum wastewater rising main internal diameter is normally 80mm as per the IW Code of Practice for Wastewater. Rising mains shall connect to the Irish Water network via a separate discharge manhole with vent stack, and short section of gravity sewer, in accordance with the Code of Practice for Wastewater Infrastructure. Minimum 24-hour emergency storage should be provided

in the pumping station sump above the pump “On” level. Irish Water will NOT accept chemical usage for the control of septicity. The pump sump should be sized appropriately to reduce the retention times.

- Please note, upgrade works are currently underway at Merlin Park No.1 pumping Station. Based on current information, these works are due to be complete in Q3 2025. Connection to the network for this development is only feasible after this date.

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

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

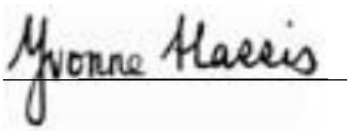
## Where can you find more information?

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

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

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

Yours sincerely,



**Yvonne Harris**
**Head of Customer Operations**

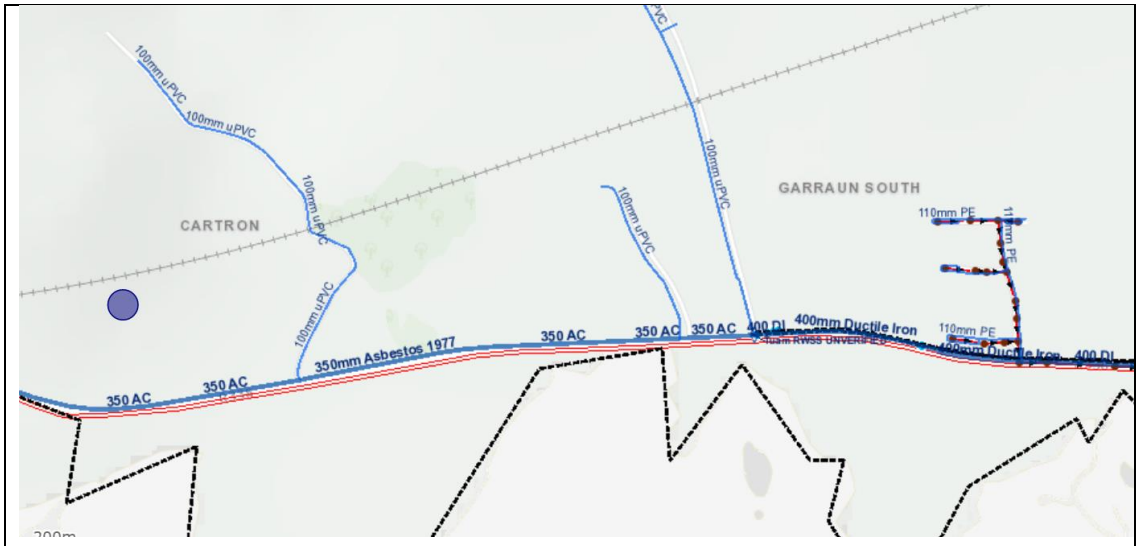
## Section A - What is important to know?

| What is important to know? | Why is this important? |
|---|---|
| **Do you need a contract to connect?** | • Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s).<br>• Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water. |
| **When should I submit a Connection Application?** | • A connection application should only be submitted after planning permission has been granted. |
| **Where can I find information on connection charges?** | • Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/ |
| **Who will carry out the connection work?** | • All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*.<br>*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.<br>• **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.<br>• **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges. |
| **Where do I find details of Irish Water's network(s)?** | • Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie |

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

## Section B – Details of Irish Water's Network(s)

**The map included below outlines the current Irish Water infrastructure adjacent the Development:** To access Irish Water Maps email datarequests@water.ie




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

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

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

Cathal Kennedy
Unit 6, Kingswood Business Centre
Citywest Business Campus
Dublin 24
D24 A068
Dublin
Ireland

**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 May 2024

**Re: Design Submission for R338, Coast Rd, Oranmore, Galway (the "Development") (the "Design Submission") / Connection Reference No: CDS23001839**

Dear Cathal Kennedy,

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: Kyle Jackson
Email: kyle.jackson@water.ie

Yours sincerely,

**Dermot Phelan**
**Connections Delivery Manager**

**Appendix A**

**Document Title & Revision**

- [23011-AKM-XXXX-XX-DR-C01-300001]
- [23011-AKM-XXXX-XX-DR-C01-300002]
- [23011-AKM-XXXX-XX-DR-C01-300003]
- [23011-AKM-XXXX-XX-DR-C01-410001]

*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.*

N

S

## LEGEND

PROPOSED SITE BOUNDARY

### WASTEWATER

PROPOSED FOUL SEWER

RISING MAIN

INSPECTION CHAMBER

### STORMWATER

PROPOSED STORM SEWER

SOAKAWAY

PROPOSED INFILTRATION TRENCH

PROPOSED BIO-SWALE

INLET KERB

REDUCED COVER FOR PIPEWORK THROUGHOUT SITE. ALL PIPES WITH LESS THAN 1.2m COVER ARE TO BE ENCASED IN CONCRETE AS PER UE STD-WW-08

ANY PIPE CROSSINGS WITH LESS THAN 300mm COVER ARE TO BE CONCRETE ENCASED.

THE ENTIRE INFRASTRUCTURE IS TO BUILT TO UISCE ÉIREANN CODES OF PRACTICE AND STANDARD DETAILS

## NOTES

1. NO PART OF THIS DRAWING MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR STORED IN ANY RETRIEVAL SYSTEM OF ANY NATURE WITHOUT THE WRITTEN PERMISSION OF AKM DESIGN AS COPYRIGHT HOLDER, EXCEPT AS AGREED FOR USE ON THE PROJECT FOR WHICH THE DRAWING IS ORIGINALLY ISSUED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND SPECIFICATION.
3. ALL DIMENSIONS ARE IN m UNLESS OTHERWISE NOTED.
4. DO NOT SCALE DIMENSIONS.
5. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. DISCREPANCIES SHALL BE REPORTED TO THIS OFFICE IN WRITING.

### WASTEWATER

1. WASTEWATER SERVICES ARE TO BE IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE DOC IW-CDS-5030-03.
2. ALL INFRASTRUCTURE WILL BE PROVIDED IN LINE WITH THE IRISH WATER STANDARD DETAILS.
3. uPVC SN8 PIPES TO BE USED FOR FOUL WASTEWATER SEWER LAYOUT.
4. MANHOLES LOCATED IN GRASS AREAS ARE TO BE SURROUNDED BY A CONCRETE PLINTH, 200MM ALL ROUND AND 100MM DEEP FORMED OF C20/25 CONCRETE, 20MM AGGREGATE SIZE BEDDED IN CASE 804 MATERIAL.
5. SEWER SPACINGS TO BE AS PER IRISH WATER STANDARD DETAIL STW-WW-05:
   - ALL SEWER PIPES TO BE A MINIMUM OF 300mm AWAY FROM OUTSIDE OF MANHOLES.
   - ALL SEWER PIPES TO BE A MINIMUM OF 1000mm AWAY FROM ROS KERBS.
   - ALL MANHOLES TO BE A MINIMUM OF 500mm AWAY FROM ROS KERBS.
6. ALL PIPE CROSSINGS WITH LESS THAN 300mm VERTICAL CLEARANCE TO BE ENCASED IN CONCRETE.

### STORMWATER

1. STORMWATER SERVICES ARE TO BE IN ACCORDANCE WITH "RECOMMENDATIONS FOR SITE DEVELOPMENT WORKS", "GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS" AND LOCAL AUTHORITY REQUIREMENTS.
2. uPVC SN8 PIPES TO BE USED FOR STORM WATER SEWER LAYOUT.

Pump Station

# PROPOSED FOUL & STORM WATER LAYOUT

SCALE 1:500

| REV | DATE | DESCRIPTION |
|---|---|---|
| | | |

FOR INFORMATION



PREPARED BY

**AKM DESIGN**
Chartered Consulting Engineers
Unit 6, Kingswood Business Centre,
Citywest Business Campus, Dublin 24
T: +353 1 479 6234 E: info@akmdesign.ie
Structural I Civil I Building I Development Consultants I Sustainable Design

CLIENT

MARSHALL YARDS DEVELOPMENT COMPANY LTD.

PROJECT TITLE

CARTRON GALWAY

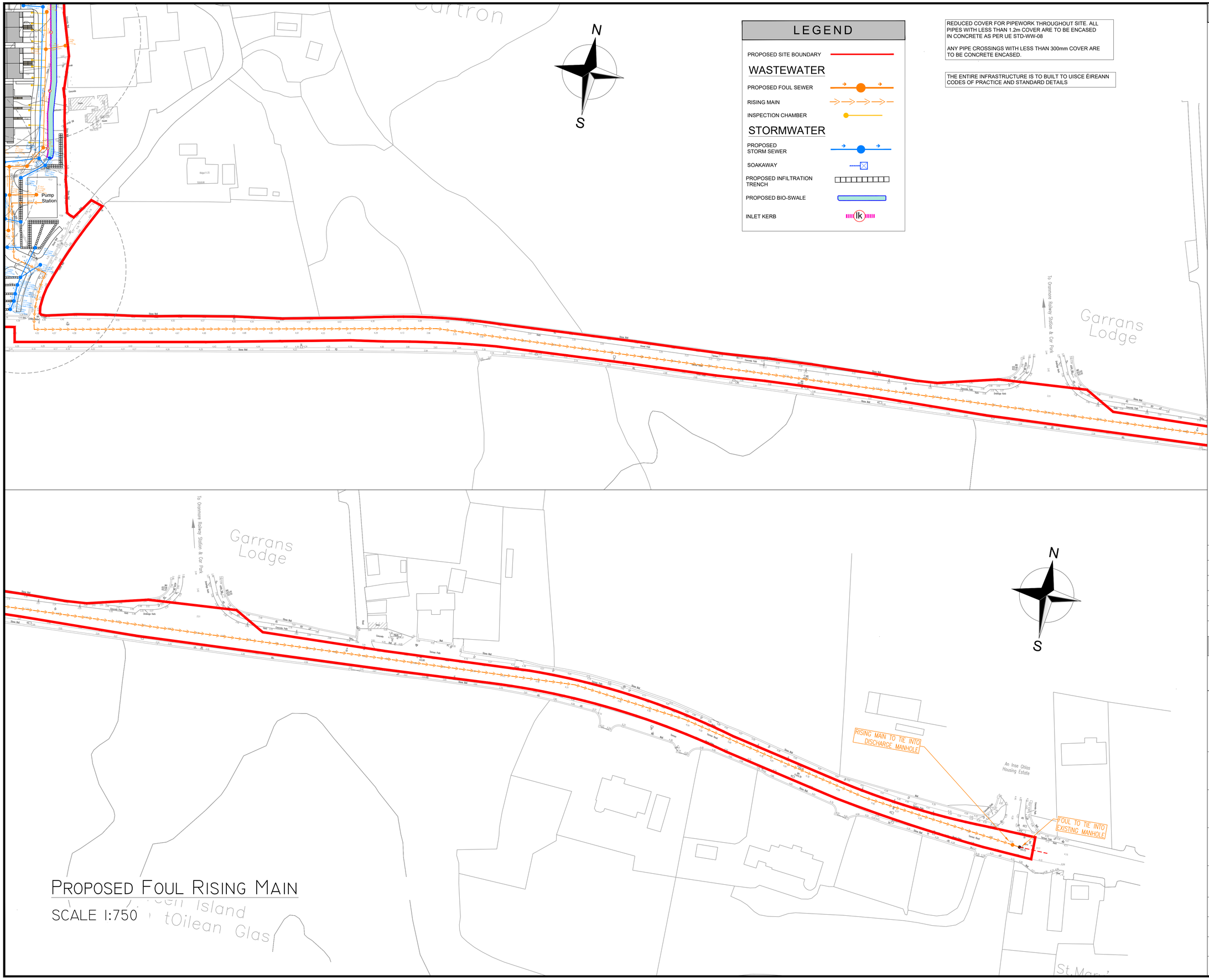
DRAWING TITLE

PROPOSED FOUL & STORM WATER LAYOUT

| SCALES: | DRAWN: | APPROVED: |
|---|---|---|
| 1:500 @ A1 | DO | CK |
| | DATE: 04/24 | DATE: 04/24 |

DOCUMENT NUMBER: 23011-AKM-XXXX-XX-DR-C01-300001 — STAGE: S2

| PROJECT CODE: | SEQUENCE NUMBER: | AKM JOB NUMBER: |
|---|---|---|
| 23011 | 300001 | 23011 |
| DEPARTMENT CODE: E | ROLES CODE: C01 | DOCUMENT CODE: DR |
| ORGANISATION CODE: AKM | LEVELS & LOCATION CODE: XX | REVISION: 00 |




# PROPOSED FOUL RISING MAIN

SCALE 1:750

## LEGEND

- PROPOSED SITE BOUNDARY

**WASTEWATER**

- PROPOSED FOUL SEWER
- RISING MAIN
- INSPECTION CHAMBER

**STORMWATER**

- PROPOSED STORM SEWER
- SOAKAWAY
- PROPOSED INFILTRATION TRENCH
- PROPOSED BIO-SWALE
- INLET KERB

REDUCED COVER FOR PIPEWORK THROUGHOUT SITE. ALL PIPES WITH LESS THAN 1.2m COVER ARE TO BE ENCASED IN CONCRETE AS PER UE STD-WW-08

ANY PIPE CROSSINGS WITH LESS THAN 300mm COVER ARE TO BE CONCRETE ENCASED.

THE ENTIRE INFRASTRUCTURE IS TO BUILT TO UISCE ÉIREANN CODES OF PRACTICE AND STANDARD DETAILS

## NOTES

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5. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. DISCREPANCIES SHALL BE REPORTED TO THIS OFFICE IN WRITING.

### WASTEWATER

1. WASTEWATER SERVICES ARE TO BE IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE DOC IW-CDS-5030-03.
2. ALL INFRASTRUCTURE WILL BE PROVIDED IN LINE WITH THE IRISH WATER STANDARD DETAILS.
3. uPVC SN8 PIPES TO BE USED FOR FOUL WASTEWATER SEWER LAYOUT.
4. MANHOLES LOCATED IN GRASS AREAS ARE TO BE SURROUNDED BY A CONCRETE PLINTH, 200MM ALL ROUND AND 100MM DEEP FORMED OF C20/25 CONCRETE, 20MM AGGREGATE SIZE BEDDED IN CASE 804 MATERIAL.
5. SEWER SPACINGS TO BE AS PER IRISH WATER STANDARD DETAIL STW-WW-05:
   - ALL SEWER PIPES TO BE A MINIMUM OF 300mm AWAY FROM OUTSIDE OF MANHOLES.
   - ALL SEWER PIPES TO BE A MINIMUM OF 1000mm AWAY FROM ROS KERBS.
   - ALL MANHOLES TO BE A MINIMUM OF 500mm AWAY FROM ROS KERBS.
6. ALL PIPE CROSSINGS WITH LESS THAN 300mm VERTICAL CLEARANCE TO BE ENCASED IN CONCRETE.

### STORMWATER

1. STORMWATER SERVICES ARE TO BE IN ACCORDANCE WITH "RECOMMENDATIONS FOR SITE DEVELOPMENT WORKS", "GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS" AND LOCAL AUTHORITY REQUIREMENTS.
2. uPVC SN8 PIPES TO BE USED FOR STORM WATER SEWER LAYOUT.

| REV | DATE | DESCRIPTION |
|---|---|---|
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| | | |
| | | |

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CLIENT

MARSHALL YARDS DEVELOPMENT COMPANY LTD.

PROJECT TITLE

CARTRON GALWAY

DRAWING TITLE

PROPOSED FOUL RISING MAIN

| SCALES: | DRAWN: | APPROVED: |
|---|---|---|
| 1:500 @ A1 | DO | CK |
| | DATE: 04/24 | DATE: 04/24 |

| DOCUMENT NUMBER: | | STAGE: |
|---|---|---|
| 23011-AKM-XXXX-XX-DR-C01-300002 | | S2 |
| PROJECT CODE: 23011 | SEQUENCE NUMBER: 300002 | AKM JOB NUMBER: 23011 |
| DEPARTMENT CODE: E | ROLES CODE: C01 | DOCUMENT CODE: DR |
| ORGANISATION CODE: AKM | LEVELS & LOCATION CODE: XX | REVISION: 00 |

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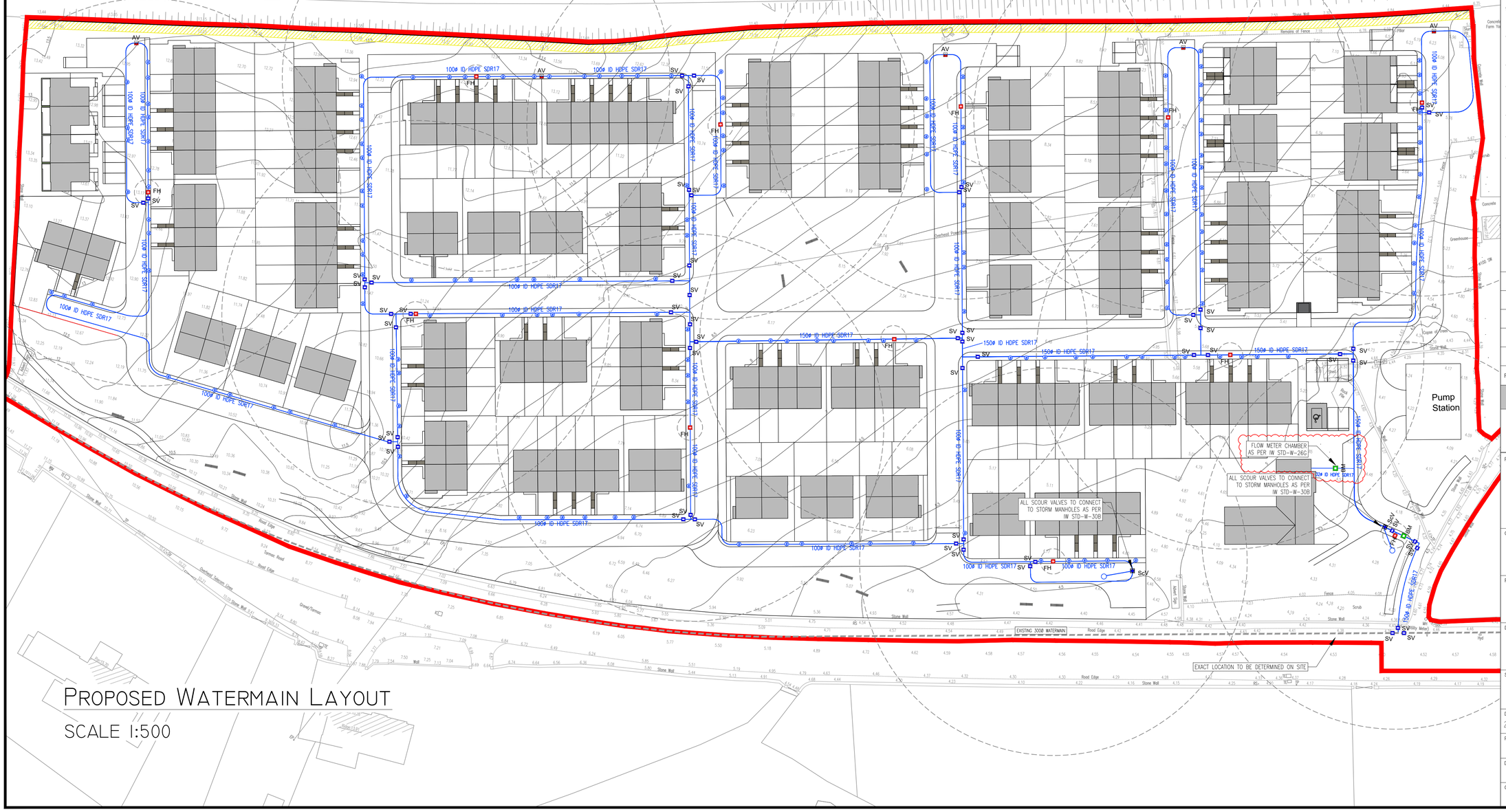
## LEGEND

| | | | |
|---|---|---|---|
| PROPOSED WATERMAIN | | | |
| EXISTING WATERMAIN | | | |
| PROPOSED HYDRANT | FH | PROPOSED SCOUR VALVE | ScV |
| PROPOSED SLUICE VALVE | | PROPOSED AIR VALVE | AV |
| BULK METER | BM | PROPOSED BOUNDARY BOX | |
| FIRE HYDRANT 46M RADII | | | |

REDUCED COVER FOR PIPEWORK THROUGHOUT SITE. ALL PIPES WITH LESS THAN 1.2m COVER ARE TO BE ENCASED IN CONCRETE AS PER UE STD-WW-08

ANY PIPE CROSSINGS WITH LESS THAN 300mm COVER ARE TO BE CONCRETE ENCASED.

THE ENTIRE INFRASTRUCTURE IS TO BUILT TO UISCE ÉIREANN CODES OF PRACTICE AND STANDARD DETAILS




# PROPOSED WATERMAIN LAYOUT

SCALE 1:500

## NOTES

1. NO PART OF THIS DRAWING MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR STORED IN ANY RETRIEVAL SYSTEM OF ANY NATURE WITHOUT THE WRITTEN PERMISSION OF AKM DESIGN AS COPYRIGHT HOLDER, EXCEPT AS AGREED FOR USE ON THE PROJECT FOR WHICH THE DRAWING IS ORIGINALLY ISSUED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND SPECIFICATION.
3. ALL DIMENSIONS ARE IN m UNLESS OTHERWISE NOTED.
4. DO NOT SCALE DIMENSIONS.
5. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. DISCREPANCIES SHALL BE REPORTED TO THIS OFFICE IN WRITING.

### WATERMAIN

1. HANDLING, LAYING,TESTING AND STERILIZATION OF WATERMAIN PIPEWORK TO BE IN ACCORDANCE WITH IRISH WATER & LOCAL AUTHORITY REQUIREMENTS.
2. ALL PROPOSED WATERMAINS TO BE HDPE MATERIAL TYPE PE-80 AND SDR-17 RATING UNLESS OTHERWISE STATED.
3. CONCRETE ANCHOR BLOCKS AT DES ENDS, TEES, BOTH SIDES OF SLUICE VALVES AND AT ALL BENDS OVER 11.25°.
4. MIN. COVER TO CROWN OF WATERMAIN TO BE 900mm.
5. HYDRANTS TO IS EN 14339, IS EN 1074 PART 6 AND B.S. 750 AND TO BE TYPE 2 HAVING AN 80MM DIAMETER FLANGE PN16 RATED TO IRISH WATER REQUIREMENTS.
6. HYDRANTS, AIR VALVES, SLUICE VALVES AND SCOUR VALVES SHALL BE INSTALLED IN CHAMBERS SUITABLY SIZED TO ACCOMMODATE THE FITTING AND ALLOW ACCESS FOR INSPECTION AND MAINTENANCE. THEY SHALL HAVE MINIMUM PLAN AREA OF 600MM X 600MM.
7. DEPTH TO HYDRANT OUTLET NOT TO EXCEED 250mm FROM FINISHED GROUND LEVEL.
8. SLUICE VALVES TO BE LOCATED IN CHAMBER AND TO BE DOUBLE FLANGED TO IS EN 1074 PART 1 AND 2. DEPTH OF SLUICE VALVE CAP SHALL BE WITHIN 300MM OF FINISHED GROUND LEVEL.
9. TEES, BOTH SIDES OF SLUICE VALVES AND WATERMAIN UNDER ROSS TO BE BACKFILLED USING SELECTED GRANULAR MATERIAL.
10. NO PART OF ANY BUILDING SHALL BE CLOSER THAN 3m TO A WATERMAIN OR MORE THAN 46m FROM THE NEAREST HYDRANT.
11. WATERMAINS SHALL BE LOOPED OR INTERCONNECTED NO DES ENDS ARE TO BE USED.
12. BOUNDARY BOXES SHALL BE LOCATED 225MM FROM EDGE OF PROPERTY BOUNDARY AND FITTED WITH A CLASS B OR CLASS C COVER TO BS 5834.
13. REFER TO IRISH WATER DOCUMENT "CODE OF PRACTICE FOR WATER INFRASTRUCTURE" IW-CDS-5020-03.
14. TYPICAL SERVICE LAYOUT DISTANCES TO BE AS PER IRISH WATER STANDARD DETAIL STD-W-11.
15. WATERMAINS TO BE DECOMMISSIONED ARE TO BE CUT, CAPPED AND BURIED AT BOTH ENDS.

| REV | DATE | DESCRIPTION |
|---|---|---|
| | | |

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MARSHALL YARDS DEVELOPMENT COMPANY LIMITED

PROJECT TITLE

CARTRON GALWAY

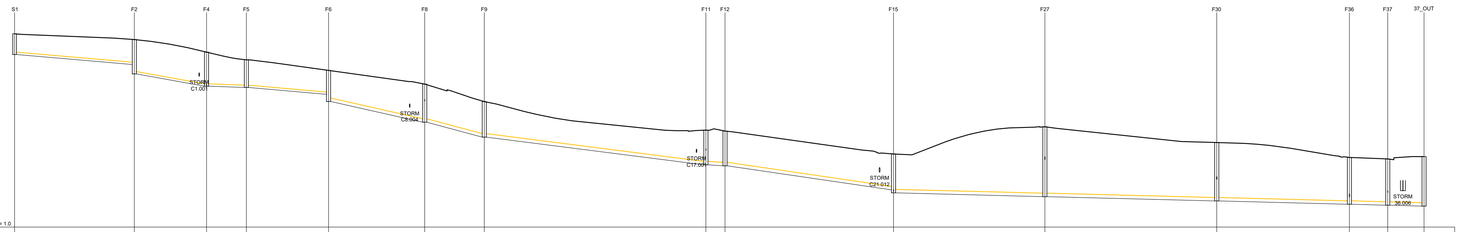
DRAWING TITLE

PROPOSED WATERMAIN LAYOUT

| SCALES: | DRAWN: | APPROVED: |
|---|---|---|
| 1:500 @ A1 | DO | CK |
| | DATE: 04/24 | DATE: 04/24 |

| DOCUMENT NUMBER: | STAGE: |
|---|---|
| 23011-AKM-XXXX-XX-DR-C01-300003 | S2 |

| PROJECT CODE: | SEQUENCE NUMBER: | AKM JOB NUMBER: |
|---|---|---|
| 23011 | 300003 | 23011 |
| DEPARTMENT CODE: | ROLES CODE: | DOCUMENT CODE: |
| E | C01 | DR |
| ORGANISATION CODE: | LEVELS & LOCATION CODE: | REVISION: |
| AKM | XX | 00 |

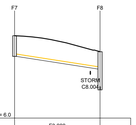



Vert exaggeration = 5.0 Datum = 1.0

| Link Name | | F1.000 | F1.001 | F1.002 | F1.003 | F1.004 | F1.005 | F1.006 | F1.007 | F1.008 | F1.009 | F1.010 | F1.011 | F1.012 | F1.013 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Section Type | | 150mm | 150mm | 150mm | 150mm | 225mm | 225mm | 225mm | 225mm | 225mm | 225mm | 225mm | 225mm | 225mm | 225mm | |
| Slope (1:X) | | 1:60.0 | 1:29.5 | 1:149.5 | 1:59.9 | 1:23.2 | 1:20.0 | 1:40.0 | 1:100.8 | 1:35.0 | 1:200.0 | 1:200.0 | 1:200.0 | 1:200.0 | 1:200.0 | |
| Cover Level (m) | | 13.621 | 13.244 | 12.423 | 11.918 | 11.226 | 10.132 | 9.792 | 7.252 | 7.329 | 7.269 | 5.972 | 5.717 | 7.547 | 6.519 | 5.643 | 5.400 | 5.600 |
| Invert Level (m) | | 12.366 | 11.614<br>11.600 | 10.200<br>10.200 | 10.113<br>10.113 | 9.605<br>9.200 | 7.495<br>7.495 | 6.873<br>6.873 | 5.904<br>5.904 | 5.804<br>5.802 | 3.430<br>3.234 | 2.967<br>2.967 | 2.706<br>2.706 | 2.469<br>2.469 | 2.426<br>2.426 | 2.367 | |
| Length (m) | | 39.088 | 23.581 | 13.002 | 26.822 | 31.407 | 19.432 | 72.348 | 6.249 | 55.015 | 49.431 | 56.102 | 43.316 | 12.513 | 11.854 | |

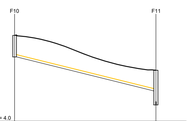

Vert exaggeration = 5.0 Datum = 9.0

| Link Name | | D3 | F2.000 | F4 | |
|---|---|---|---|---|---|
| Section Type | | | 150mm | | |
| Slope (1:X) | | | 1:20.4 | | |
| Cover Level (m) | | 12.992 | | 12.423 | |
| Invert Level (m) | | 11.216 | | 10.200 | |
| Length (m) | | | 20.741 | | |



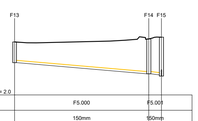

Vert exaggeration = 5.0 Datum = 6.0

| Link Name | | F3.000 | | |
|---|---|---|---|---|
| Section Type | | 150mm | | |
| Slope (1:X) | | 1:33.8 | | |
| Cover Level (m) | | 11.375 | | 10.332 |
| Invert Level (m) | | 10.025 | | 9.205 |
| Length (m) | | 27.898 | | |



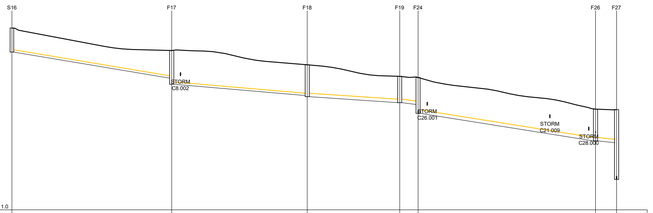

Vert exaggeration = 5.0 Datum = 4.0

| Link Name | | F4.000 | | |
|---|---|---|---|---|
| Section Type | | 150mm | | |
| Slope (1:X) | | 1:20.8 | | |
| Cover Level (m) | | 9.607 | | 7.329 |
| Invert Level (m) | | 8.300 | | 5.979 |
| Length (m) | | 46.134 | | |



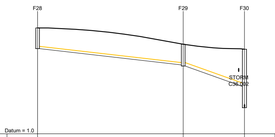

Vert exaggeration = 5.0 Datum = 2.0

| Link Name | | F5.000 | | F5.001 | |
|---|---|---|---|---|---|
| Section Type | | 150mm | | 150mm | |
| Slope (1:X) | | 1:59.9 | | 1:59.4 | |
| Cover Level (m) | | 5.439 | 5.400 | 5.664 | 5.772 |
| Invert Level (m) | | 4.139 | | 3.378<br>3.378 | 3.305<br>3.305 |
| Length (m) | | 43.815 | | 9.114 | |




Vert exaggeration = 5.0 Datum = 1.0

| Link Name | | F6.000 | F6.001 | F6.002 | F6.003 | F6.004 | F6.005 | |
|---|---|---|---|---|---|---|---|---|
| Section Type | | 150mm | 150mm | 225mm | 225mm | 225mm | 225mm | |
| Slope (1:X) | | 1:30.7 | 1:59.9 | 1:78.0 | 1:50.0 | 1:32.2 | 1:60.0 | |
| Cover Level (m) | | 12.870 | 11.401 | 10.470 | 9.716 | 9.640 | 7.576 | 7.547 |
| Invert Level (m) | | 11.300 | 9.650<br>9.200 | 8.367<br>8.367 | 8.000<br>8.000 | 7.900<br>7.900 | 5.500<br>5.500 | 5.385 |
| Length (m) | | 52.178 | 44.232 | 30.188 | 5.990 | 57.944 | 6.870 | |

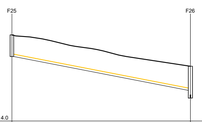



Vert exaggeration = 5.0 Datum = 1.0

| Link Name | | F9.000 | F9.001 | |
|---|---|---|---|---|
| Section Type | | 150mm | 225mm | |
| Slope (1:X) | | 1:44.8 | 1:15.0 | |
| Cover Level (m) | | 7.906 | 6.946 | 6.519 |
| Invert Level (m) | | 6.556 | 5.496<br>5.413 | 4.688 |
| Length (m) | | 47.539 | 19.992 | |

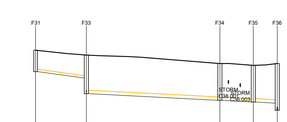

Vert exaggeration = 5.0 Datum = 6.0

| Link Name | | F7.000 | F7.001 | F7.002 | |
|---|---|---|---|---|---|
| Section Type | | 150mm | 150mm | 225mm | |
| Slope (1:X) | | 1:60.0 | 1:21.2 | 1:23.0 | |
| Cover Level (m) | | 12.885 | 11.964<br>11.804 | 10.117 | 9.440 |
| Invert Level (m) | | 11.535 | 10.365<br>10.365 | 8.500<br>8.500 | 7.990 |
| Length (m) | | 70.163 | 39.595 | 21.883 | |




Vert exaggeration = 5.0 Datum = 4.0

| Link Name | | F8.000 | |
|---|---|---|---|
| Section Type | | 150mm | |
| Slope (1:X) | | 1:26.4 | |
| Cover Level (m) | | 9.421 | 8.209 7.576 |
| Invert Level (m) | | 8.210 | 6.600 |
| Length (m) | | 58.266 | |




Vert exaggeration = 5.0 Datum = 1.0

| Link Name | | F10.000 | F10.001 | F10.002 | F10.003 | |
|---|---|---|---|---|---|---|
| Section Type | | 150mm | 225mm | 225mm | 225mm | |
| Slope (1:X) | | 1:39.6 | 1:100.0 | 1:100.0 | 1:100.0 | |
| Cover Level (m) | | 6.413 | 6.697 | 5.541 | 6.432 | 5.546 |
| Invert Level (m) | | 5.018 | 4.600<br>3.978 | 3.142<br>3.142 | 3.033<br>3.033 | 2.955 |
| Length (m) | | 16.562 | 43.610 | 10.886 | 7.841 | |


Vert exaggeration = 5.0 Datum = 2.0

| Link Name | | F11.000 | |
|---|---|---|---|
| Section Type | | 150mm | |
| Slope (1:X) | | 1:59.8 | |
| Cover Level (m) | | 5.969 | 6.007 |
| Invert Level (m) | | 3.800 | 3.653 |
| Length (m) | | 8.785 | |


Vert exaggeration = 5.0 Datum = 1.0

| Link Name | | F12.000 | |
|---|---|---|---|
| Section Type | | 150mm | |
| Slope (1:X) | | 1:60.0 | |
| Cover Level (m) | | 5.910 | 5.400 |
| Invert Level (m) | | 3.500 | 3.238 |
| Length (m) | | 15.719 | |

# NOTES



THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND SPECIFICATION.

ALL DIMENSIONS IN m UNLESS NOTED.

DO NOT SCALE DIMENSIONS.

THE CONTRACTOR SHALL CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. DISCREPANCIES SHALL BE REPORTED TO THIS OFFICE IN WRITING.

## WASTEWATER

1. WASTEWATER SERVICES ARE TO BE IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE DOC IW-CDS-5030-03
2. ALL INFRASTRUCTURE WILL BE PROVIDED IN LINE WITH THE IRISH WATER STANDARD DETAILS
3. uPVC SN8 PIPES TO BE USED FOR FOUL WASTEWATER SEWER LAYOUT
4. MANHOLES LOCATED IN GRASS AREAS ARE TO BE SURROUNDED BY A CONCRETE PLINTH, 200MM ALL ROUND AND 100MM DEEP FORMED OF C20/25 CONCRETE, 20MM AGGREGATE SIZE BEDDED IN CLASE 804 MATERIAL.

## STORMWATER

1. STORMWATER SERVICES ARE TO BE IN ACCORDANCE WITH "RECOMMENDATIONS FOR SITE DEVELOPMENT WORKS", "GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS" AND LOCAL AUTHORITY REQUIREMENTS
2. uPVC SN8 PIPES TO BE USED FOR STORM WATER SEWER LAYOUT

| REV | DATE | DESCRIPTION |
|---|---|---|
| | | |

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CLIENT

MARSHALL YARDS DEVELOPMENT COMPANY LTD.

PROJECT TITLE

CARTRON GALWAY

DRAWING TITLE

PROPOSED FOUL SEWER SECTIONS

| SCALES: | DRAWN: | APPROVED: |
|---|---|---|
| 1:1000 HORIZONTAL<br>1:200 VERTICAL | AB | CK |
| | DATE: 04/24 | DATE: 04/24 |

| DOCUMENT NUMBER: | STAGE: |
|---|---|
| 23011-AKM-XXXX-XX-DR-C01-410001 | S2 |

| PROJECT CODE: | SEQUENCE NUMBER: | AKM JOB NUMBER: |
|---|---|---|
| 23011 | 400001 | 23011 |
| DEPARTMENT CODE: | ROLES CODE: | DOCUMENT CODE: |
| E | C01 | DR |
| ORGANISATION CODE: | LEVELS & LOCATION CODE: | REVISION: |
| AKM | XX | 00 |