Limerick City & County Council

Mungret Residential Development,

Wet Services Report

MUN-ARUP-ZZ-00-RP-C-0001

Issue 01 | 20 December 2023

Job number 261585

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Document verification

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Job title		Mungret Residential Development,		**Job number**	261585
Document title		Wet Services Report		**File reference**	
Document ref		MUN-ARUP-ZZ-00-RP-C-0001			
Revision	**Date**	**Filename**	MUN-ARUP-ZZ-00-RP-C-0001 - Wet Services Report_Issue01.docx		
Issue 01	20 Dec 2023	**Description**	Issued for Planning		
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		Filename			
		Description			
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		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
				Issue Document verification with document	✓

Contents

1 Introduction

Limerick City & County Council proposes to develop its site in Mungret, Co. Limerick. The site is located to the south east of the suburb of Mungret, which is 5km south west of Limerick City. The site is located south of and adjacent to both Mungret Community College and the existing Mungret Woods residential development.

The proposed development on circa 7.2 hectares of land, zoned for development purposes within the Limerick Development Plan 2022 – 2028, is located within the curtilage of a protected structure Mungret College Stables and Outbuildings (RPS No. 1658 1660 & 1661) whilst repair works are proposed to the Observatory (Seismic Station) (RPS No.1658).

The proposed development seeks the construction of:

- 250 no. residential units including 36 no. two bed houses; 108 no. three bed houses; 25 no. four bed houses; 2 no. five bed community dwellings; 37 no. two bed apartment units; and 42 no. one bed apartment units with renewable energy design measures (which may be provided externally) for each housing unit.
- A crèche facility with capacity to accommodate 70 no. children
- 1 no. community facility with ancillary café
- 2 no. community facility units fronting the public square and positioned within the Independent Living for Older Persons complex
- Public toilet
- Landscaping works including (a) provision of playground and kick about areas; (b) new pedestrian and cycle connections; and (c) public square
- Associated site and infrastructural works including provision for (a) water services, foul and surface water drainage and associated connections and (b) attenuation proposals including permeable paving and swales; (c) 4 no. ESB substations; (d) external plant and services; (e) car and bicycle parking; and
- all associated site development works.

This report outlines the potable water, foul water drainage and surface water drainage strategies for the proposed development.

Please refer to Electrical ducting drawings and report for information on all other below ground services.

2 LIHAF Road Development

The LIHAF Road is being developed as a standalone project to support this development as well as others in the vicinity. This standalone project is substantially complete. The Mungret development will rely on infrastructure proposed as part of the link street development. Arup have liaised with Mott MacDonald (the LIHAF Road lead civils designers) to ensure the Mungret development is sufficiently served by the LIHAF Road infrastructure provision as regards potable, foul and surface water. The LIHAF Road infrastructure will be referenced in the below sections.

3 Potable Water

3.1 Existing Potable Water

There is an existing potable water supply serving both the existing Mungret Community College to the north west of the site and the existing Mungret Woods residential development to the north east of the site, see Appendix A. A new potable water supply has been provided to the south of the site as part of the LIHAF Road design.

3.2 Potable Water Design Criteria

The watermain has been designed in accordance with the following guidelines and standards:

- Irish Water Code of Practice for Water Supply
- Civil Engineering Specification for the Water Industry (CESWI)
- BS EN 805:2000 Water Supply – Requirements for systems and components outside buildings
- Part B of the Building Regulations
- Potable Water Demand loadings are outlined below:
    - Residential -150 l/person/day as per Irish Water Code of Practice with an assumed population density of 2.7 persons/dwelling
    - Retail/Commercial - 300 l/100m2/day

3.3 Proposed Potable Water Supply Strategy

It is proposed to make 4 No. new connections off the LIHAF Road water main to serve the site. It is understood Mott MacDonald's watermain design has accounted for the expected water demand for the entire site. Additionally, it is proposed to connect the proposed water main on site into the existing water infrastructure in the north east to provide interconnectivity of the Irish Water network. The necessity of this interconnectivity requires confirmation by Irish Water. A

Confirmation of Feasibility has been received from Irish Water confirming capacity within their network to serve the development, subject to network extension upgrades. These works were carried out under the LIHAF project.

The strategy for potable water supply to buildings within the development is as follows:

- Provide individual connections off the watermain to each residential house unit. A boundary box will be provided in the street immediately outside the house.
- Apartment blocks will be served by a single connection to the block. There will be a meter room within the block beyond which the supply will be split to serve individual units.
- All other buildings on site (creche, community facility, retail, etc.) will be served by an individual water connection with a dedicated meter.

Hydrants will be provided on site at spacings to ensure fire regulations are met. They will be located in easily accessible locations, e.g., footpaths.

The proposed potable water strategy is described by drawing MUN-ARUP-ZZ-ZZ-DR-C-0040.

4 Foul Water Drainage

4.1 Existing Foul Water Drainage

There is an existing 225mm diameter foul water sewer serving Mungret Woods residential development to the north east of the site, which flows in a northerly direction, see Appendix A. A 225mm diameter foul water sewer has been provided as part of the Mott MacDonald LIHAF Road design. This flows from west to east along the southern boundary of the site.

4.2 Foul Water Design Criteria

The design criteria used to develop the foul network includes the following:

- BS EN 752 – Drain and sewer systems outside buildings
- Part H Building Regulations
- Irish Water Code of Practice for Wastewater Infrastructure
- Minimum self-cleansing velocity – 0.75m/s. Where this is unachievable due to site constraints pipes are proposed at a gradient of no flatter than 1inX where X =pipe diameter in mm as per industry best practice.
- Colebrook-White roughness value of 1.5mm for all pipework
- Minimum pipe size – 150mm

- Sanitary DWF loadings are outlined below:
    - Residential -165 l/person/day as per Irish Water Code of Practice with an assumed population density of 2.7 persons/dwelling
    - Retail/Commercial - 300 l/100m2/day

4.3 Proposed Foul Water Strategy

It is proposed to collect all foul water from the proposed development in a dedicated foul sewer network. A network of primary carrier sewers will be provided located predominantly within the development roads. Each building will discharge to an inspection chamber immediately outside the property boundary before connecting to the primary carrier sewer.

The majority of the development will discharge via one of four proposed connections to the link street sewer. It is understood Mott MacDonald's LIHAF Road foul sewer design has accounted for the expected foul water discharge off site.

Due to the site topography 26 No. houses located in the north west of the site will discharge to an existing foul sewer currently serving the Mungret Woods development.

The proposed foul water strategy is described by drawing MUN-ARUP-ZZ-ZZ-DR-C-0030 and longsections of the foul water network are provided in Appendix C.

5 Surface Water Drainage

5.1 Existing Surface water

There is an existing 500mm diameter surface water drain serving Mungret Woods residential development to the north east of the site, which flows in a northerly direction. The remainder of the site is currently greenfield.

A surface water drain has been provided as part of the Mott MacDonald LIHAF Road design. This flows from west to east along the southern boundary of the site.

5.2 Surface water Drainage Design Criteria

The following design standards and guidelines have been followed in the design of the surface water drainage for the site:

- BS EN 752 – Drains and sewer system outside buildings.
- Greater Dublin Strategic Drainage Study (GDSDS) Volume 2 – New Developments.
- The network has been designed to the following criteria:

  - No surcharging of pipes for up to and including the 1 in 5-year return period rainfall event
  - No above ground flooding for up to and including the 1 in 30-year return period rainfall event
  - No above ground flooding for up to and including the 1 in 100year return period rainfall event plus a 30% allowance for climate change. This means no flooding of vulnerable developments (e.g., residential units), significant infrastructure (e.g., substations) and no increase of flood risk to neighbouring sites.

- Proposed minimum and maximum velocities shall be as follows:
  - Carrier pipe network – 1.0m/s to 3.0m/s.
- Colebrook White roughness value of 0.6mm for all pipework
- Minimum 225mm diameter pipework except 150mm for road gully and porous paving connections

The LIHAF Road sewer design is sized to received runoff form site not exceeding 2.86 l/s/ha. This limitation is applied to runoff from the site as shown on the drawings as described in Section 5.3.

5.3 Proposed Surface Water Strategy

It is proposed to collect all surface water from the proposed development in a dedicated surface water pipe network. A network of primary carrier pipes will be provided located predominantly within the development roads. Each building will discharge to an inspection chamber immediately outside the property boundary, where it will pass through porous paving outside the dwelling, before connecting to the primary carrier sewer. Runoff from areas of hardstanding will be collected by road gullies, linear drainage channels or conveyance swales. Where possible runoff towards soft landscaping will be encouraged to provide water quality benefits as well as reducing runoff from site during low intensity rainfall events. Where feasible, road gullies will discharge to tree pits, improving water quality while slowing discharge from the site. Blue roofs will be provided on the Independent Living for Older Persons units and on the Creche. This will control run off at source and provide attenuated discharge from these buildings.

The majority of the development will discharge via one of four proposed connections to the LIHAF Road surface water network and will be limited to discharge rates as outlined in section 5.2 above. Due to the site topography 26 No. houses located in the north west of the site will discharge to the existing surface sewer currently serving the Mungret Woods development. This runoff will also be limited to 2.86 l/s/ha.

A hydrobrake or similar flow control device will be provided immediately prior to each discharge point to restrict runoff to the required rates. Attenuation will be provided in the form of geocellular crates upstream of the hydrobrakes. In total 6 No. flow control devices and 6 No. attenuation facilities will be provided.

The finished ground levels design will be such to promote overland flow away from buildings during exceedance events.

The surface water network was modelled using Microdrainage software, results of which are presented in Appendix B.

Water quality will be addressed as follows:

- Conveyance swales will be provided along large grassed open areas. It is proposed to install 6no. conveyance swales (circa 200 linear metres) around the site. Sections of flat kerbs will allow drainage from hardstanding enter the swales. This will provide a water quality benefit by filtering the runoff as well as reducing the volume of runoff from the site during lower intensity rainfall events. A catch pit at the outlet from the swales will also reduce the amount of silt and debris entering the drainage network further improving water quality. Typical Longitudinal sections and cross sections of conveyance swale showing construction build up for each layer with clear specifications, will be submitted to the Planning Authority for prior approval as part of the detailed design stage and in advance of commencing on site.

- Porous paving will be provided at all dwellings. This will take all hardstanding run of from the domestic dwellings. This will provide a water quality benefit as well as reducing and slowing runoff from site. Porous paving will be sealed, 600mm deep, and fitted with an orifice plate to allow for local attenuation. A high-level overflow will be provided at 350mm off invert for larger rainfall events.

- All road gullies, linear drainage channels and swales will be provided with sumps to provide points at which silt/grit/etc. can be collected and removed.

- Where possible levels will be designed to promote runoff towards soft landscaping. This will provide a water quality benefit as well as reducing runoff from site during low intensity rainfall events.

- A blue roof will be provided on the Independent Living for Older Persons units and on the Creche. This will control run off at source and provide attenuated discharge from these buildings. A detailed cross section through the blue roof will be submitted to the Planning Authority for prior approval as part of the detailed design stage and in advance of commencing on site.

- Immediately west of the Independent Living for Older Persons units and in the surrounds of the creche there is a concentration of parking spaces. To mitigate against the risk of pollution downstream, all runoff from these areas will pass through a Class 1 By-Pass Hydrocarbon Interceptor prior to discharge offsite. This interceptor will have a control kiosk and ventilation as required by manufacturer, positioned adjacent to the interceptor. Kiosk will include alarms and telemetry system. This will be submitted to the Planning Authority for prior approval as part of the detailed design stage and in advance of commencing on site.

- To mitigate against the risk of pollution downstream, all discharge from the site will pass through a Class 1 By-Pass Hydrocarbon Interceptor prior to discharge offsite. This interceptor will have a control kiosk and ventilation as required by manufacturer, positioned adjacent to the interceptor. Kiosk will include alarms and telemetry system. This will be submitted to the Planning Authority for prior approval as part of the detailed design stage and in advance of commencing on site.

The proposed surface water strategy is described by drawing MUN-ARUP-ZZ-ZZ-DR-C-0020. Longsections of the surface water network are provided in Appendix D.

5.4 Proposed SuDS Mitigation Strategy

There are several different land uses within the project which will have their own pollution risks and SuDS treatment trains. These are:

- Residential roofs – SuDS include porous paving and class 1 bypass Separator.
- Individual property driveways and residential car parking– SuDS include porous paving and class 1 bypass Separator.
- Low traffic roads alongside Swales – SuDS include Swales and class 1 bypass Separator.
- Low traffic roads – SuDS include class 1 bypass Separator.

The table below details the pollution risks based on land usage that will be found on the development. This information comes from Table 26.2 of the Ciria C753

Pollution Hazard Indices				
Land use	**Pollution hazard level**	**Total suspended solids (TSS)**	**Metals**	**Hydrocarbons**
Residential roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g., cul de sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g., schools, offices) i.e. <300 traffic movements/day	Low	0.5	0.4	0.4

In order to mitigate these pollution risks and to improve the quality of water discharging from the site, a number of SuDS elements will be used as discussed in section 5.3. The table below highlights the removal rates for these features. This information comes from Table 26.3 of the Ciria C753, and information from an established Interceptor supplier.

Mitigation Indices			
Types of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Swale	0.5	0.6	0.6
Permeable paving	0.7	0.6	0.7
Class 1 Bypass Separator	0.8	0.6	0.9

SuDS Pollution Hazard Mitigation				
Land use	**Pollution hazard level**	**Total suspended solids (TSS)**	**Metals**	**Hydrocarbons**
Residential roofs	Very low	**0.2**	**0.2**	**0.05**
Types of SuDS component		**TSS**	**Metals**	**Hydrocarbons**
Porous Paving		0.7	0.6	0.7
Class 1 Bypass Separator		0.8	0.6	0.9
Total Removal		**1.5**	**1.2**	**1.6**

Based on the above table the SuDS treatment train for domestic roof areas is sufficient to mitigate the low risks of pollution which may occur on these areas.

SuDS Pollution Hazard Mitigation				
Land use	**Pollution hazard level**	**Total suspended solids (TSS)**	**Metals**	**Hydrocarbons**
Individual property driveways Residential car parking	Low	**0.5**	**0.4**	**0.4**
Types of SuDS component		**TSS**	**Metals**	**Hydrocarbons**
Porous Paving		0.7	0.6	0.7
Class 1 Bypass Separator		0.8	0.6	0.9
Total Removal		**1.5**	**1.2**	**1.6**

Based on the above table the SuDS treatment train for individual property driveways and for Residential Car parking is sufficient to mitigate the low risks of pollution which may occur on these areas.

SuDS Pollution Hazard Mitigation				
Land use	**Pollution hazard level**	**Total suspended solids (TSS)**	**Metals**	**Hydrocarbons**
Low traffic roads adjacent to Swales	Low	**0.5**	**0.4**	**0.4**
Types of SuDS component		**TSS**	**Metals**	**Hydrocarbons**
Swales		0.5	0.6	0.6
Class 1 Bypass Separator		0.8	0.6	0.9
Total Removal		**1.3**	**1.2**	**1.5**

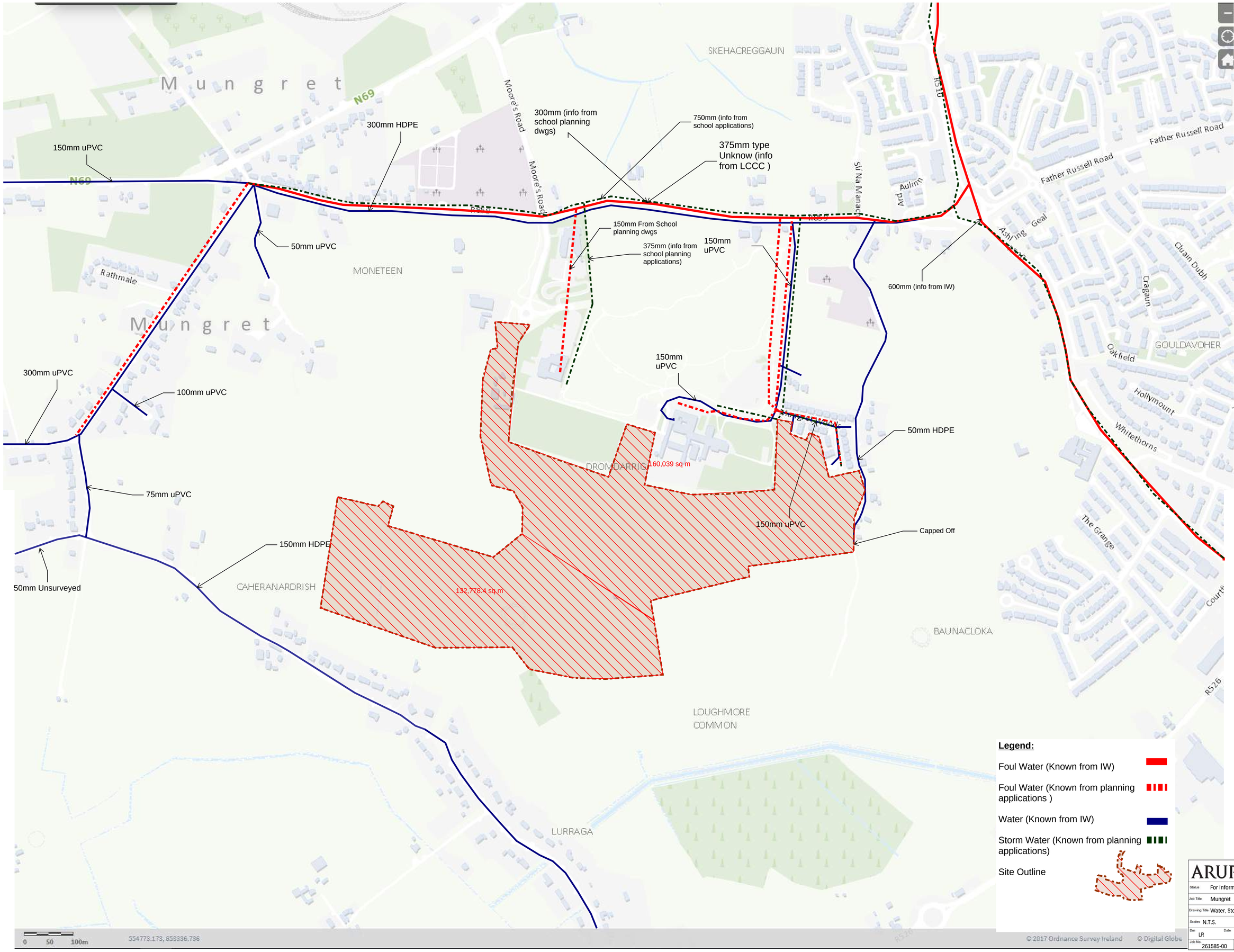
Based on the above table the SuDS treatment train for low traffic roads adjacent to Swales is sufficient to mitigate the low risks of pollution which may occur on these areas.

SuDS Pollution Hazard Mitigation				
Land use	**Pollution hazard level**	**Total suspended solids (TSS)**	**Metals**	**Hydrocarbons**
Low traffic roads	Low	**0.5**	**0.4**	**0.4**
Types of SuDS component		**TSS**	**Metals**	**Hydrocarbons**
Class 1 Bypass Separator		0.8	0.6	0.9
Total Removal		**0.8**	**0.6**	**0.9**

Based on the above table the SuDS treatment train for low traffic roads adjacent to Swales is sufficient to mitigate the low risks of pollution which may occur on these areas.

In summary the SuDS measures outlined for use on the Mungret Development will provide greater pollutant removal capacity than the expected pollutant loading.

Appendix A – Existing Utility Information



Legend:

- Foul Water (Known from IW)
- Foul Water (Known from planning applications)
- Water (Known from IW)
- Storm Water (Known from planning applications)
- Site Outline

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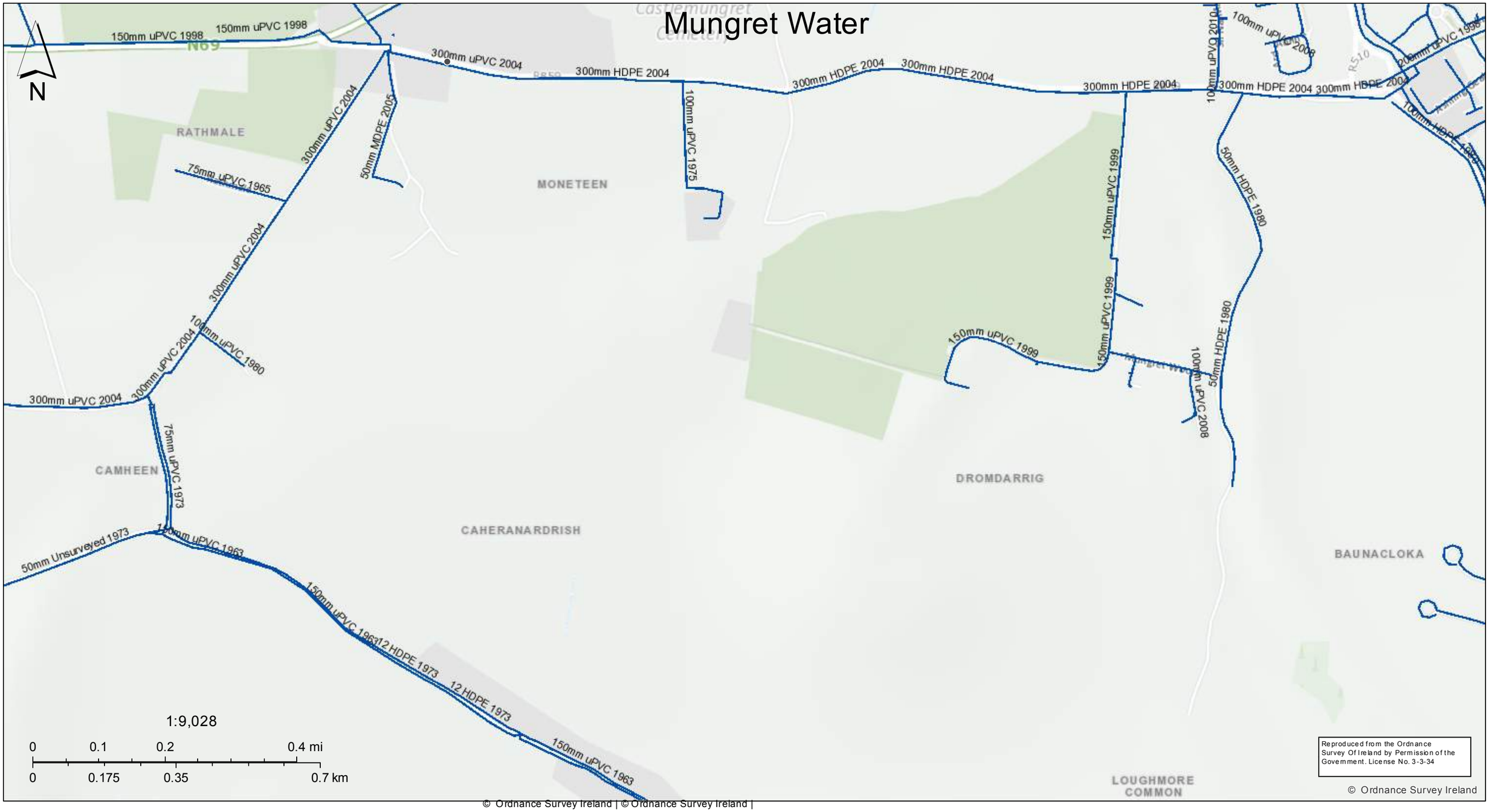
Status	For Information
Job Title	Mungret
Drawing Title	Water, Storm, Foul
Scales	N.T.S.
File Ref.	A
Drn.	LR
Date	09-05-18
Checked	
Job No.	261585-00
Drg. No.	4
Rev.	A

Mungret Water



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Legend

- Treatment Plant
- Potable Water
- Water Abandoned Lines

Reservoir

- Potable
- Raw Water
- Pump Stations

Water Mains(Irish Water Owned)

- Untreated

Water Mains(Non Irish Water Owned)

- Untreated
- Potable Water

Water Lateral Lines

- Irish Water
- Non IW

Mungret Foul Sewer & Surface Water

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Legend

Stormwater Gravity Mains (Irish Water Owned)
- Surface

Stormwater Gravity Mains (Non-Irish Water Owned)
- Surface

Sewer Gravity Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Gravity Mains (Non-Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Pressurized Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Pressurized Mains (Non-Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown
- Treatment plant

Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland. It should not be relied upon in the event of excavations or other works being carried out in the vicinity of the network. The onus is on the parties carrying out the works to ensure the exact location of the network is identified prior to mechanical works being carried out. Service pipes are not generally shown but their presence should be anticipated. © Irish Water

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Appendix B – Surface Water Drainage calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	0.000
M5-60 (mm)	15.000	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	1.200
Ratio R	0.300	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	50	Add Flow / Climate Change (%)	30	Min Slope for Optimisation (1:X)	500
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.000		

Designed with Level Soffits

Time Area Diagram for Storm at outfall SW MH (pipe S1.005)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.429	4-8	0.307

Total Area Contributing (ha) = 0.735

Total Pipe Volume (m^3) = 26.721

Time Area Diagram at outfall SW MH (pipe S6.011)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.626	4-8	0.441	8-12	0.000

Total Area Contributing (ha) = 1.067

Total Pipe Volume (m^3) = 27.022

Time Area Diagram at outfall SW MH (pipe S19.009)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.435	4-8	0.401

Total Area Contributing (ha) = 0.836

Total Pipe Volume (m³) = 23.003

Time Area Diagram at outfall SW MH (pipe S37.009)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.440	4-8	0.358

Total Area Contributing (ha) = 0.798

Total Pipe Volume (m³) = 18.344

Time Area Diagram at outfall SW MH (pipe S53.013)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.292	4-8	0.238

Total Area Contributing (ha) = 0.530

Total Pipe Volume (m³) = 14.260

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design

Network Results Table

Network Design Table for Storm

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	10.554	0.053	200.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	37.260	0.166	225.0	0.018	5.00	0.0	0.600	o	300	Pipe/Conduit	
S2.001	30.050	0.134	224.3	0.075	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	12.591	0.126	99.9	0.062	5.00	0.0	0.600	o	300	Pipe/Conduit	
S3.001	23.867	0.239	99.9	0.084	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.002	18.402	0.184	100.0	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.003	26.038	0.517	50.4	0.015	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.002	36.310	0.161	225.5	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	37.878	0.473	80.1	0.026	5.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	18.752	0.283	66.3	0.063	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.002	11.270	0.141	80.0	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	3.990	0.013	306.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.16	15.906	0.000	0.0	0.0	0.0	1.11	78.3	0.0
S2.000	50.00	5.59	15.825	0.018	0.0	0.0	0.7	1.04	73.8	3.1
S2.001	50.00	6.07	15.659	0.092	0.0	0.0	3.8	1.05	73.9	16.3
S3.000	50.00	5.13	16.700	0.062	0.0	0.0	2.5	1.57	111.2	10.9
S3.001	50.00	5.39	16.574	0.146	0.0	0.0	5.9	1.57	111.2	25.7
S3.002	50.00	5.58	16.335	0.224	0.0	0.0	9.1	1.57	111.1	39.5
S3.003	50.00	5.78	16.151	0.239	0.0	0.0	9.7	2.22	157.0	42.1
S2.002	50.00	6.65	15.525	0.367	0.0	0.0	14.9	1.04	73.7	64.7
S4.000	50.00	5.43	16.775	0.026	0.0	0.0	1.0	1.46	58.2	4.5
S4.001	50.00	5.63	16.302	0.088	0.0	0.0	3.6	1.61	64.0	15.6
S4.002	50.00	5.75	16.019	0.105	0.0	0.0	4.2	1.46	58.2	18.4
S1.001	50.00	6.72	15.364	0.472	0.0	0.0	19.2	1.03	113.6	83.1

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.002	3.990	0.013	300.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.003	49.304	0.164	300.6	0.165	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	42.913	0.536	80.1	0.016	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	17.257	0.377	45.8	0.015	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	5.697	0.019	300.0	0.068	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	8.008	0.027	300.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.000	4.192	0.028	147.7	0.036	5.00	0.0	0.600	o	150	Pipe/Conduit	
S6.001	2.837	0.028	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.002	22.581	0.267	84.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S7.000	4.141	0.026	161.3	0.039	5.00	0.0	0.600	o	150	Pipe/Conduit	
S7.001	2.567	0.026	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.003	29.709	0.426	69.7	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.002	50.00	6.78	15.276	0.472	0.0	0.0	19.2	1.04	115.0	83.1
S1.003	49.51	7.57	15.287	0.637	0.0	0.0	25.6	1.04	114.8	111.1
S5.000	50.00	5.49	16.150	0.016	0.0	0.0	0.6	1.46	58.2	2.8
S5.001	50.00	5.64	15.614	0.030	0.0	0.0	1.2	1.94	77.1	5.3
S1.004	49.24	7.66	15.123	0.735	0.0	0.0	29.4	1.04	115.0«	127.5
S1.005	48.88	7.79	15.104	0.735	0.0	0.0	29.4	1.04	115.0«	127.5
S6.000	50.00	5.08	16.200	0.036	0.0	0.0	1.4	0.82	14.6	6.3
S6.001	50.00	5.13	16.172	0.036	0.0	0.0	1.4	1.00	17.8	6.3
S6.002	50.00	5.48	15.375	0.036	0.0	0.0	1.4	1.09	19.3	6.3
S7.000	50.00	5.09	16.000	0.039	0.0	0.0	1.6	0.79	13.9	6.8
S7.001	50.00	5.13	15.974	0.039	0.0	0.0	1.6	1.00	17.8	6.8
S6.003	50.00	5.89	15.058	0.094	0.0	0.0	3.8	1.21	21.3	16.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S8.000	3.829	0.017	229.0	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S8.001	1.672	0.017	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.002	8.857	0.089	99.5	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S9.000	3.543	0.025	143.6	0.032	5.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	2.491	0.025	101.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.003	21.435	0.218	98.3	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
S10.000	3.650	0.027	137.0	0.031	5.00	0.0	0.600	o	150	Pipe/Conduit	
S10.001	2.664	0.027	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.004	22.980	0.210	109.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S11.000	3.715	0.039	94.1	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
S11.001	3.715	0.039	94.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S8.000	50.00	5.10	16.000	0.041	0.0	0.0	1.7	0.66	11.7	7.2
S8.001	50.00	5.12	15.983	0.041	0.0	0.0	1.7	1.00	17.8	7.2
S8.002	50.00	5.27	15.450	0.048	0.0	0.0	2.0	1.01	17.8	8.5
S9.000	50.00	5.07	16.300	0.032	0.0	0.0	1.3	0.84	14.8	5.6
S9.001	50.00	5.11	16.275	0.032	0.0	0.0	1.3	1.00	17.7	5.6
S8.003	50.00	5.62	15.361	0.098	0.0	0.0	4.0	1.01	17.9	17.2
S10.000	50.00	5.07	16.500	0.031	0.0	0.0	1.3	0.86	15.1	5.5
S10.001	50.00	5.12	16.473	0.031	0.0	0.0	1.3	1.00	17.8	5.5
S8.004	50.00	5.93	15.068	0.129	0.0	0.0	5.3	1.25	49.7	22.8
S11.000	50.00	5.06	16.100	0.026	0.0	0.0	1.1	1.04	18.3	4.6
S11.001	50.00	5.12	16.061	0.026	0.0	0.0	1.1	1.04	18.3	4.6

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S12.000	3.904	0.029	134.8	0.054	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.001	2.897	0.029	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.005	22.926	0.251	91.3	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.004	35.213	0.115	306.2	0.036	0.00	0.0	0.600	o	375	Pipe/Conduit	
S13.000	3.894	0.039	100.0	0.052	5.00	0.0	0.600	o	150	Pipe/Conduit	
S13.001	3.894	0.039	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.005	20.728	0.117	177.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.006	22.319	0.097	230.7	0.070	0.00	0.0	0.600	o	375	Pipe/Conduit	
S14.000	4.257	0.044	97.5	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S14.001	4.257	0.044	97.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S12.000	50.00	5.08	16.200	0.054	0.0	0.0	2.2	0.86	15.3	9.5
S12.001	50.00	5.12	16.171	0.054	0.0	0.0	2.2	1.00	17.8	9.5
S8.005	50.00	6.21	14.858	0.232	0.0	0.0	9.4	1.37	54.4	40.9
S6.004	50.00	6.78	14.482	0.362	0.0	0.0	14.7	1.03	113.8	63.8
S13.000	50.00	5.06	16.020	0.052	0.0	0.0	2.1	1.00	17.8	9.1
S13.001	50.00	5.13	15.981	0.052	0.0	0.0	2.1	1.00	17.8	9.1
S6.005	50.00	7.03	14.367	0.414	0.0	0.0	16.8	1.36	150.0	72.9
S6.006	50.00	7.35	14.175	0.484	0.0	0.0	19.7	1.19	131.3	85.2
S14.000	50.00	5.07	15.800	0.041	0.0	0.0	1.7	1.02	18.0	7.3
S14.001	50.00	5.14	15.756	0.041	0.0	0.0	1.7	1.02	18.0	7.3

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.007	15.138	0.058	261.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.008	15.587	0.236	66.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.000	5.079	0.051	100.0	0.042	5.00	0.0	0.600	o	150	Pipe/Conduit	
S15.001	5.079	0.051	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.009	15.137	0.229	66.0	0.063	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.000	40.577	1.071	37.9	0.116	5.00	0.0	0.600	o	150	Pipe/Conduit	
S17.000	36.553	0.719	50.8	0.100	5.00	0.0	0.600	o	225	Pipe/Conduit	
S17.001	23.973	0.502	47.8	0.141	0.00	0.0	0.600	o	225	Pipe/Conduit	
S16.001	33.719	0.879	38.4	0.047	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.010	15.468	0.122	127.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.007	49.51	7.57	14.078	0.526	0.0	0.0	21.1	1.11	123.1	91.6
S6.008	49.17	7.69	14.020	0.526	0.0	0.0	21.1	2.23	246.7	91.6
S15.000	50.00	5.08	15.290	0.042	0.0	0.0	1.7	1.00	17.8	7.3
S15.001	50.00	5.17	15.239	0.042	0.0	0.0	1.7	1.00	17.8	7.3
S6.009	48.85	7.80	13.784	0.631	0.0	0.0	25.0	2.23	246.7	108.5
S16.000	50.00	5.41	15.775	0.116	0.0	0.0	4.7	1.64	29.0	20.3
S17.000	50.00	5.33	15.925	0.100	0.0	0.0	4.1	1.84	73.1	17.6
S17.001	50.00	5.54	15.206	0.240	0.0	0.0	9.8	1.90	75.5	42.3
S16.001	50.00	5.81	14.629	0.403	0.0	0.0	16.4	2.12	84.2	70.9
S6.010	48.40	7.96	13.550	1.034	0.0	0.0	40.6	1.61	177.4	176.1

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S18.000	42.286	0.775	54.6	0.012	5.00	0.0	0.600	o	150	Pipe/Conduit	
S18.001	42.075	0.672	62.6	0.010	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.011	9.852	0.118	83.5	0.011	0.00	0.0	0.600	o	375	Pipe/Conduit	
S19.000	3.182	0.032	100.0	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S19.001	3.182	0.032	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S19.002	19.434	0.263	73.9	0.014	0.00	0.0	0.600	o	150	Pipe/Conduit	
S20.000	3.458	0.022	157.8	0.039	5.00	0.0	0.600	o	150	Pipe/Conduit	
S20.001	2.191	0.022	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S19.003	15.504	0.155	100.0	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit	
S21.000	3.639	0.036	100.0	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S21.001	3.639	0.036	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S18.000	50.00	5.52	15.150	0.012	0.0	0.0	0.5	1.36	24.1	2.2
S18.001	50.00	6.07	14.375	0.023	0.0	0.0	0.9	1.27	22.5	4.0
S6.011	48.17	8.04	13.428	1.067	0.0	0.0	41.8	1.98	219.1	181.0
S19.000	50.00	5.05	16.150	0.041	0.0	0.0	1.7	1.00	17.8	7.3
S19.001	50.00	5.11	16.118	0.041	0.0	0.0	1.7	1.00	17.8	7.3
S19.002	50.00	5.38	15.250	0.055	0.0	0.0	2.2	1.17	20.7	9.7
S20.000	50.00	5.07	16.000	0.039	0.0	0.0	1.6	0.80	14.1	6.8
S20.001	50.00	5.11	15.978	0.039	0.0	0.0	1.6	1.00	17.8	6.8
S19.003	50.00	5.64	14.937	0.103	0.0	0.0	4.2	1.00	17.8«	18.2
S21.000	50.00	5.06	16.000	0.041	0.0	0.0	1.7	1.00	17.8	7.2
S21.001	50.00	5.12	15.964	0.041	0.0	0.0	1.7	1.00	17.8	7.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S19.004	33.752	0.209	161.5	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
S22.000	3.501	0.035	100.0	0.072	5.00	0.0	0.600	o	150	Pipe/Conduit	
S22.001	3.501	0.035	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S22.002	34.729	0.347	100.0	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
S22.003	22.797	0.093	246.4	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
S23.000	3.453	0.035	100.0	0.045	5.00	0.0	0.600	o	150	Pipe/Conduit	
S23.001	3.453	0.035	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S23.002	42.441	0.424	100.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit	
S24.000	4.938	0.049	100.0	0.032	5.00	0.0	0.600	o	150	Pipe/Conduit	
S24.001	4.938	0.049	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S22.004	28.784	0.144	200.0	0.011	0.00	0.0	0.600	o	300	Pipe/Conduit	
S25.000	3.788	0.038	100.0	0.032	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S19.004	50.00	6.19	14.716	0.161	0.0	0.0	6.5	1.03	40.8	28.3
S22.000	50.00	5.06	16.600	0.072	0.0	0.0	2.9	1.00	17.8	12.7
S22.001	50.00	5.12	16.565	0.072	0.0	0.0	2.9	1.00	17.8	12.7
S22.002	50.00	5.69	15.850	0.092	0.0	0.0	3.7	1.00	17.8	16.1
S22.003	50.00	6.15	15.256	0.111	0.0	0.0	4.5	0.83	32.9	19.6
S23.000	50.00	5.06	16.300	0.045	0.0	0.0	1.8	1.00	17.8	7.9
S23.001	50.00	5.11	16.265	0.045	0.0	0.0	1.8	1.00	17.8	7.9
S23.002	50.00	5.82	15.450	0.088	0.0	0.0	3.6	1.00	17.8	15.6
S24.000	50.00	5.08	16.450	0.032	0.0	0.0	1.3	1.00	17.8	5.6
S24.001	50.00	5.16	16.401	0.032	0.0	0.0	1.3	1.00	17.8	5.6
S22.004	50.00	6.58	14.538	0.242	0.0	0.0	9.8	1.11	78.3	42.6
S25.000	50.00	5.06	16.400	0.032	0.0	0.0	1.3	1.00	17.8	5.7

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S25.001	3.788	0.038	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S22.005	9.023	0.046	198.2	0.028	0.00	0.0	0.600	o	300	Pipe/Conduit	
S26.000	4.271	0.023	186.9	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit	
S26.001	2.327	0.023	101.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S22.006	29.663	0.532	55.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S27.000	7.826	0.078	100.0	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit	
S19.005	14.550	0.129	112.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S28.000	6.029	0.060	100.0	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
S19.006	14.541	0.073	199.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S25.001	50.00	5.13	16.362	0.032	0.0	0.0	1.3	1.00	17.8	5.7
S22.005	50.00	6.72	14.455	0.303	0.0	0.0	12.3	1.11	78.7	53.3
S26.000	50.00	5.10	16.600	0.047	0.0	0.0	1.9	0.73	12.9	8.3
S26.001	50.00	5.14	16.577	0.047	0.0	0.0	1.9	1.00	17.6	8.3
S22.006	50.00	6.95	14.409	0.350	0.0	0.0	14.2	2.11	149.1	61.6
S27.000	50.00	5.13	15.600	0.014	0.0	0.0	0.6	1.00	17.8	2.4
S19.005	50.00	7.12	13.877	0.524	0.0	0.0	21.3	1.48	104.6	92.3
S28.000	50.00	5.10	15.500	0.018	0.0	0.0	0.7	1.00	17.8	3.2
S19.006	50.00	7.31	13.672	0.543	0.0	0.0	22.0	1.28	141.1	95.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S29.000	6.724	0.067	99.9	0.015	5.00	0.0	0.600	o	150	Pipe/Conduit	
S30.000	4.186	0.021	198.5	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit	
S30.001	2.111	0.021	100.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S19.007	8.752	0.044	199.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S31.000	4.151	0.042	100.0	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
S31.001	3.677	0.042	88.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S32.000	3.486	0.030	115.0	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
S32.001	2.135	0.030	70.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S31.002	24.123	0.814	29.6	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S33.000	3.408	0.041	82.4	0.046	5.00	0.0	0.600	o	150	Pipe/Conduit	
S33.001	2.693	0.041	65.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S29.000	50.00	5.11	14.400	0.015	0.0	0.0	0.6	1.01	17.8	2.7
S30.000	50.00	5.10	14.200	0.047	0.0	0.0	1.9	0.71	12.5	8.3
S30.001	50.00	5.13	14.179	0.047	0.0	0.0	1.9	1.00	17.7	8.3
S19.007	49.90	7.44	13.618	0.605	0.0	0.0	24.5	1.11	78.4«	106.3
S31.000	50.00	5.07	16.000	0.026	0.0	0.0	1.0	1.00	17.8	4.5
S31.001	50.00	5.13	15.958	0.026	0.0	0.0	1.0	1.07	18.9	4.5
S32.000	50.00	5.06	16.250	0.026	0.0	0.0	1.0	0.94	16.5	4.5
S32.001	50.00	5.09	16.220	0.026	0.0	0.0	1.0	1.20	21.2	4.5
S31.002	50.00	5.34	15.575	0.059	0.0	0.0	2.4	1.86	32.8	10.3
S33.000	50.00	5.05	16.200	0.046	0.0	0.0	1.9	1.11	19.6	8.1
S33.001	50.00	5.09	16.159	0.046	0.0	0.0	1.9	1.25	22.1	8.1

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S31.003	22.110	0.556	39.8	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S34.000	31.629	0.907	34.9	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
S35.000	3.988	0.068	58.5	0.025	5.00	0.0	0.600	o	150	Pipe/Conduit	
S35.001	3.410	0.068	50.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S31.004	26.522	0.661	40.1	0.018	0.00	0.0	0.600	o	225	Pipe/Conduit	
S31.005	14.769	0.198	74.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S36.000	35.874	0.612	58.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S19.008	25.871	0.100	258.7	0.050	0.00	0.0	0.600	o	450	Pipe/Conduit	
S19.009	6.427	0.032	200.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S37.000	3.230	0.055	58.5	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S31.003	50.00	5.57	14.711	0.111	0.0	0.0	4.5	1.60	28.3	19.6
S34.000	50.00	5.31	15.575	0.026	0.0	0.0	1.1	1.71	30.2	4.6
S35.000	50.00	5.05	15.600	0.025	0.0	0.0	1.0	1.32	23.3	4.3
S35.001	50.00	5.09	15.532	0.025	0.0	0.0	1.0	1.43	25.2	4.3
S31.004	50.00	5.79	14.080	0.180	0.0	0.0	7.3	2.07	82.4	31.8
S31.005	50.00	5.95	13.419	0.180	0.0	0.0	7.3	1.52	60.3	31.8
S36.000	50.00	5.45	14.000	0.000	0.0	0.0	0.0	1.32	23.3	0.0
S19.008	48.91	7.78	12.245	0.836	0.0	0.0	33.2	1.26	200.3	144.0
S19.009	48.70	7.86	12.145	0.836	0.0	0.0	33.2	1.43	228.1	144.0
S37.000	50.00	5.04	16.900	0.050	0.0	0.0	2.0	1.32	23.3	8.8

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S37.001	3.230	0.055	58.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S37.002	35.044	0.352	99.6	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
S37.003	38.685	0.258	150.0	0.047	0.00	0.0	0.600	o	225	Pipe/Conduit	
S38.000	3.974	0.022	182.7	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit	
S38.001	2.176	0.022	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S39.000	4.418	0.044	101.0	0.043	5.00	0.0	0.600	o	150	Pipe/Conduit	
S39.001	2.559	0.044	58.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S37.004	21.036	0.125	168.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S40.000	3.337	0.057	58.5	0.030	5.00	0.0	0.600	o	150	Pipe/Conduit	
S40.001	3.337	0.057	58.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S41.000	4.484	0.045	100.0	0.031	5.00	0.0	0.600	o	150	Pipe/Conduit	
S41.001	4.484	0.045	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S37.001	50.00	5.08	16.845	0.050	0.0	0.0	2.0	1.32	23.3	8.8
S37.002	50.00	5.66	16.150	0.058	0.0	0.0	2.3	1.01	17.8	10.1
S37.003	50.00	6.27	15.723	0.105	0.0	0.0	4.3	1.07	42.4	18.5
S38.000	50.00	5.09	16.500	0.021	0.0	0.0	0.9	0.74	13.1	3.7
S38.001	50.00	5.13	16.478	0.021	0.0	0.0	0.9	1.00	17.8	3.7
S39.000	50.00	5.07	16.500	0.043	0.0	0.0	1.8	1.00	17.7	7.6
S39.001	50.00	5.11	16.456	0.043	0.0	0.0	1.8	1.32	23.3	7.6
S37.004	50.00	6.62	15.493	0.169	0.0	0.0	6.9	1.01	40.0	29.8
S40.000	50.00	5.04	16.400	0.030	0.0	0.0	1.2	1.32	23.3	5.2
S40.001	50.00	5.08	16.343	0.030	0.0	0.0	1.2	1.32	23.3	5.2
S41.000	50.00	5.07	16.100	0.031	0.0	0.0	1.3	1.00	17.8	5.5
S41.001	50.00	5.15	16.055	0.031	0.0	0.0	1.3	1.00	17.8	5.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S37.005	46.009	0.992	46.4	0.043	0.00	0.0	0.600	o	225	Pipe/Conduit	
S42.000	3.478	0.035	100.0	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	
S42.001	3.478	0.035	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S42.002	26.553	0.400	66.4	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	
S42.003	12.040	0.144	83.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S43.000	5.234	0.048	108.3	0.060	5.00	0.0	0.600	o	150	Pipe/Conduit	
S43.001	2.862	0.048	59.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S42.004	37.111	0.256	144.8	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
S44.000	4.073	0.049	83.2	0.063	5.00	0.0	0.600	o	150	Pipe/Conduit	
S44.001	2.886	0.049	58.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S42.005	29.834	0.300	99.4	0.024	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S37.005	50.00	7.01	15.368	0.273	0.0	0.0	11.1	1.93	76.6	48.0
S42.000	50.00	5.06	16.900	0.050	0.0	0.0	2.1	1.00	17.8	8.9
S42.001	50.00	5.12	16.865	0.050	0.0	0.0	2.1	1.00	17.8	8.9
S42.002	50.00	5.47	16.150	0.070	0.0	0.0	2.8	1.24	21.8	12.3
S42.003	50.00	5.66	15.750	0.070	0.0	0.0	2.8	1.10	19.4	12.3
S43.000	50.00	5.09	16.400	0.060	0.0	0.0	2.4	0.97	17.1	10.5
S43.001	50.00	5.13	16.352	0.060	0.0	0.0	2.4	1.31	23.1	10.5
S42.004	50.00	6.23	15.531	0.163	0.0	0.0	6.6	1.08	43.1	28.7
S44.000	50.00	5.06	16.100	0.063	0.0	0.0	2.5	1.10	19.5	11.0
S44.001	50.00	5.10	16.051	0.063	0.0	0.0	2.5	1.31	23.2	11.0
S42.005	50.00	6.61	15.275	0.250	0.0	0.0	10.1	1.31	52.1	44.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S45.000	24.441	0.244	100.0	0.025	5.00	0.0	0.600	o	150	Pipe/Conduit	
S45.001	3.738	0.064	58.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S46.000	3.843	0.066	58.7	0.061	5.00	0.0	0.600	o	150	Pipe/Conduit	
S46.001	3.843	0.066	58.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S42.006	30.971	0.600	51.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S47.000	5.035	0.086	58.5	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	
S47.001	5.134	0.086	59.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S48.000	5.724	0.058	99.5	0.044	5.00	0.0	0.600	o	150	Pipe/Conduit	
S48.001	5.867	0.058	102.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S37.006	29.623	1.000	29.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S45.000	50.00	5.41	15.200	0.025	0.0	0.0	1.0	1.00	17.8	4.3
S45.001	50.00	5.45	14.956	0.025	0.0	0.0	1.0	1.32	23.3	4.3
S46.000	50.00	5.05	15.500	0.061	0.0	0.0	2.5	1.32	23.2	10.8
S46.001	50.00	5.10	15.435	0.061	0.0	0.0	2.5	1.32	23.2	10.8
S42.006	50.00	6.89	14.975	0.336	0.0	0.0	13.6	1.82	72.6	59.1
S47.000	50.00	5.06	15.200	0.050	0.0	0.0	2.0	1.32	23.3	8.7
S47.001	50.00	5.13	15.114	0.050	0.0	0.0	2.0	1.30	23.0	8.7
S48.000	50.00	5.09	14.950	0.044	0.0	0.0	1.8	1.01	17.8	7.8
S48.001	50.00	5.19	14.892	0.044	0.0	0.0	1.8	0.99	17.6	7.8
S37.006	50.00	7.18	14.300	0.702	0.0	0.0	28.5	2.90	205.0	123.6

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S49.000	23.505	0.235	100.0	0.036	5.00	0.0	0.600	o	150	Pipe/Conduit	
S49.001	5.417	0.054	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S37.007	20.441	0.500	40.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S50.000	25.143	0.430	58.5	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S51.000	8.483	0.085	100.0	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
S51.001	6.004	0.060	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S52.000	4.099	0.041	100.0	0.034	5.00	0.0	0.600	o	150	Pipe/Conduit	
S52.001	4.099	0.041	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S37.008	9.034	0.090	100.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S37.009	8.688	0.022	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S53.000	6.918	0.071	97.4	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S49.000	50.00	5.39	14.300	0.036	0.0	0.0	1.4	1.00	17.8	6.3
S49.001	50.00	5.48	14.065	0.036	0.0	0.0	1.4	1.00	17.8	6.3
S37.007	50.00	7.32	13.300	0.738	0.0	0.0	30.0	2.47	174.3	129.9
S50.000	50.00	5.32	12.950	0.000	0.0	0.0	0.0	1.32	23.3	0.0
S51.000	50.00	5.14	13.600	0.026	0.0	0.0	1.1	1.00	17.8	4.6
S51.001	50.00	5.24	13.515	0.026	0.0	0.0	1.1	1.00	17.8	4.6
S52.000	50.00	5.07	13.400	0.034	0.0	0.0	1.4	1.00	17.8	6.1
S52.001	50.00	5.14	13.359	0.034	0.0	0.0	1.4	1.00	17.8	6.1
S37.008	49.96	7.42	12.320	0.798	0.0	0.0	32.4	1.57	111.1«	140.4
S37.009	49.54	7.56	11.670	0.798	0.0	0.0	32.4	1.01	160.7	140.4
S53.000	50.00	5.11	16.550	0.017	0.0	0.0	0.7	1.02	18.0	3.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S53.001	34.703	0.343	101.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S54.000	4.654	0.047	100.0	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
S53.002	21.856	0.336	65.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S55.000	5.146	0.051	100.0	0.015	5.00	0.0	0.600	o	150	Pipe/Conduit	
S56.000	4.019	0.024	165.4	0.056	5.00	0.0	0.600	o	150	Pipe/Conduit	
S56.001	2.430	0.024	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S53.003	21.780	0.168	129.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S57.000	5.199	0.052	100.0	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit	
S58.000	3.344	0.022	155.5	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit	
S58.001	2.175	0.022	101.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S53.001	50.00	5.69	16.479	0.017	0.0	0.0	0.7	1.00	17.6	3.0
S54.000	50.00	5.08	16.000	0.017	0.0	0.0	0.7	1.00	17.8	2.9
S53.002	50.00	5.92	15.148	0.034	0.0	0.0	1.4	1.62	64.5	5.9
S55.000	50.00	5.09	16.000	0.015	0.0	0.0	0.6	1.00	17.8	2.7
S56.000	50.00	5.09	15.850	0.056	0.0	0.0	2.3	0.78	13.8	9.8
S56.001	50.00	5.13	15.826	0.056	0.0	0.0	2.3	1.00	17.8	9.8
S53.003	50.00	6.23	14.813	0.105	0.0	0.0	4.3	1.15	45.6	18.4
S57.000	50.00	5.09	15.900	0.016	0.0	0.0	0.7	1.00	17.8	2.9
S58.000	50.00	5.07	16.530	0.047	0.0	0.0	1.9	0.80	14.2	8.3
S58.001	50.00	5.11	16.509	0.047	0.0	0.0	1.9	1.00	17.7	8.3

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S53.004	20.585	0.168	122.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S59.000	3.144	0.032	99.1	0.049	5.00	0.0	0.600	o	225	Pipe/Conduit	
S59.001	3.144	0.032	99.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S59.002	20.583	0.206	100.0	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	
S60.000	8.317	0.083	100.0	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit	
S53.005	15.178	0.426	35.7	0.014	0.00	0.0	0.600	o	225	Pipe/Conduit	
S61.000	3.789	0.038	99.0	0.027	5.00	0.0	0.600	o	150	Pipe/Conduit	
S61.001	2.239	0.038	58.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S53.006	15.178	0.426	35.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S62.000	22.594	0.226	100.0	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S53.004	50.00	6.52	14.645	0.168	0.0	0.0	6.8	1.18	46.9	29.6
S59.000	50.00	5.04	15.800	0.049	0.0	0.0	2.0	1.31	52.2	8.7
S59.001	50.00	5.08	15.768	0.049	0.0	0.0	2.0	1.31	52.2	8.7
S59.002	50.00	5.34	14.975	0.065	0.0	0.0	2.7	1.31	52.0	11.5
S60.000	50.00	5.14	15.600	0.014	0.0	0.0	0.6	1.00	17.8	2.5
S53.005	50.00	6.64	14.477	0.262	0.0	0.0	10.6	2.20	87.4	46.1
S61.000	50.00	5.06	15.100	0.027	0.0	0.0	1.1	1.01	17.8	4.8
S61.001	50.00	5.09	15.062	0.027	0.0	0.0	1.1	1.32	23.3	4.8
S53.006	50.00	6.75	14.052	0.289	0.0	0.0	11.8	2.20	87.4	50.9
S62.000	50.00	5.37	14.075	0.020	0.0	0.0	0.8	1.00	17.8	3.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S63.000	4.133	0.026	157.2	0.040	5.00	0.0	0.600	o	150	Pipe/Conduit	
S63.001	2.629	0.026	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S53.007	17.550	0.377	46.6	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
S64.000	3.519	0.017	202.1	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	
S64.001	1.766	0.017	101.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S53.008	17.550	0.377	46.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S65.000	6.502	0.065	100.0	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S65.001	6.502	0.065	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S65.002	19.935	0.199	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S53.009	7.365	0.037	197.1	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S63.000	50.00	5.09	14.600	0.040	0.0	0.0	1.6	0.80	14.1	7.0
S63.001	50.00	5.13	14.574	0.040	0.0	0.0	1.6	1.00	17.8	7.0
S53.007	50.00	6.91	13.626	0.356	0.0	0.0	14.5	1.92	76.4	62.7
S64.000	50.00	5.08	14.250	0.050	0.0	0.0	2.0	0.70	12.4	8.8
S64.001	50.00	5.11	14.233	0.050	0.0	0.0	2.0	1.00	17.6	8.8
S53.008	50.00	7.03	13.175	0.406	0.0	0.0	16.5	2.31	163.2	71.5
S65.000	50.00	5.11	14.200	0.041	0.0	0.0	1.7	1.00	17.8	7.2
S65.001	50.00	5.22	14.135	0.041	0.0	0.0	1.7	1.00	17.8	7.2
S65.002	50.00	5.55	13.375	0.041	0.0	0.0	1.7	1.00	17.8	7.2
S53.009	50.00	7.14	12.798	0.484	0.0	0.0	19.7	1.12	78.9«	85.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S66.000	3.653	0.017	215.4	0.035	5.00	0.0	0.600	o	150	Pipe/Conduit	
S66.001	1.696	0.017	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S53.010	17.869	0.115	155.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S53.011	29.440	0.294	100.1	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit	
S67.000	24.177	0.242	100.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S53.012	3.253	0.019	171.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S53.013	0.790	0.002	321.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S66.000	50.00	5.09	13.900	0.035	0.0	0.0	1.4	0.68	12.0	6.1
S66.001	50.00	5.12	13.883	0.035	0.0	0.0	1.4	1.00	17.8	6.1
S53.010	50.00	7.38	12.761	0.519	0.0	0.0	21.1	1.26	88.9«	91.3
S53.011	49.16	7.69	11.500	0.530	0.0	0.0	21.2	1.57	111.1	91.8
S67.000	50.00	5.40	10.100	0.000	0.0	0.0	0.0	1.00	17.8	0.0
S53.012	49.05	7.73	9.704	0.530	0.0	0.0	21.2	1.38	152.4	91.8
S53.013	49.01	7.75	9.685	0.530	0.0	0.0	21.2	1.01	111.1	91.8

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.018	0.018	0.018
2.001	User	-	100	0.037	0.037	0.037
	User	-	100	0.038	0.038	0.075
3.000	User	-	100	0.062	0.062	0.062
3.001	User	-	100	0.084	0.084	0.084
3.002	User	-	100	0.078	0.078	0.078
3.003	User	-	100	0.015	0.015	0.015
2.002	User	-	100	0.017	0.017	0.017
	User	-	100	0.010	0.010	0.027
	User	-	100	0.009	0.009	0.036
4.000	User	-	100	0.026	0.026	0.026
4.001	User	-	100	0.063	0.063	0.063
4.002	User	-	100	0.016	0.016	0.016
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	User	-	100	0.048	0.048	0.048
	User	-	100	0.117	0.117	0.165
5.000	User	-	100	0.016	0.016	0.016
5.001	User	-	100	0.015	0.015	0.015
1.004	User	-	100	0.068	0.068	0.068
1.005	-	-	100	0.000	0.000	0.000
6.000	User	-	100	0.036	0.036	0.036
6.001	-	-	100	0.000	0.000	0.000
6.002	-	-	100	0.000	0.000	0.000
7.000	User	-	100	0.039	0.039	0.039
7.001	-	-	100	0.000	0.000	0.000
6.003	User	-	100	0.019	0.019	0.019
8.000	User	-	100	0.041	0.041	0.041
8.001	-	-	100	0.000	0.000	0.000
8.002	User	-	100	0.007	0.007	0.007
9.000	User	-	100	0.032	0.032	0.032
9.001	-	-	100	0.000	0.000	0.000
8.003	User	-	100	0.018	0.018	0.018
10.000	User	-	100	0.031	0.031	0.031
10.001	-	-	100	0.000	0.000	0.000
8.004	-	-	100	0.000	0.000	0.000
11.000	User	-	100	0.026	0.026	0.026
11.001	-	-	100	0.000	0.000	0.000
12.000	User	-	100	0.054	0.054	0.054

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
12.001	-	-	100	0.000	0.000	0.000
8.005	User	-	100	0.011	0.011	0.011
	User	-	100	0.012	0.012	0.023
6.004	User	-	100	0.019	0.019	0.019
	User	-	100	0.018	0.018	0.036
13.000	User	-	100	0.052	0.052	0.052
13.001	-	-	100	0.000	0.000	0.000
6.005	-	-	100	0.000	0.000	0.000
6.006	User	-	100	0.024	0.024	0.024
	User	-	100	0.046	0.046	0.070
14.000	User	-	100	0.041	0.041	0.041
14.001	-	-	100	0.000	0.000	0.000
6.007	-	-	100	0.000	0.000	0.000
6.008	-	-	100	0.000	0.000	0.000
15.000	User	-	100	0.042	0.042	0.042
15.001	-	-	100	0.000	0.000	0.000
6.009	User	-	100	0.018	0.018	0.018
	User	-	100	0.045	0.045	0.063
16.000	User	-	100	0.034	0.034	0.034
	User	-	100	0.081	0.081	0.116
17.000	User	-	100	0.100	0.100	0.100
17.001	User	-	100	0.063	0.063	0.063
	User	-	100	0.078	0.078	0.141
16.001	User	-	100	0.047	0.047	0.047
6.010	-	-	100	0.000	0.000	0.000
18.000	User	-	100	0.012	0.012	0.012
18.001	User	-	100	0.010	0.010	0.010
6.011	User	-	100	0.011	0.011	0.011
19.000	User	-	100	0.041	0.041	0.041
19.001	-	-	100	0.000	0.000	0.000
19.002	User	-	100	0.014	0.014	0.014
20.000	User	-	100	0.039	0.039	0.039
20.001	-	-	100	0.000	0.000	0.000
19.003	User	-	100	0.009	0.009	0.009
21.000	User	-	100	0.041	0.041	0.041
21.001	-	-	100	0.000	0.000	0.000
19.004	User	-	100	0.017	0.017	0.017
22.000	User	-	100	0.072	0.072	0.072
22.001	-	-	100	0.000	0.000	0.000
22.002	User	-	100	0.020	0.020	0.020

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
22.003	User	-	100	0.019	0.019	0.019
23.000	User	-	100	0.045	0.045	0.045
23.001	-	-	100	0.000	0.000	0.000
23.002	User	-	100	0.022	0.022	0.022
	User	-	100	0.021	0.021	0.043
24.000	User	-	100	0.032	0.032	0.032
24.001	-	-	100	0.000	0.000	0.000
22.004	User	-	100	0.011	0.011	0.011
25.000	User	-	100	0.032	0.032	0.032
25.001	-	-	100	0.000	0.000	0.000
22.005	User	-	100	0.028	0.028	0.028
26.000	User	-	100	0.047	0.047	0.047
26.001	-	-	100	0.000	0.000	0.000
22.006	-	-	100	0.000	0.000	0.000
27.000	User	-	100	0.014	0.014	0.014
19.005	-	-	100	0.000	0.000	0.000
28.000	User	-	100	0.018	0.018	0.018
19.006	-	-	100	0.000	0.000	0.000
29.000	User	-	100	0.015	0.015	0.015
30.000	User	-	100	0.047	0.047	0.047
30.001	-	-	100	0.000	0.000	0.000
19.007	-	-	100	0.000	0.000	0.000
31.000	User	-	100	0.026	0.026	0.026
31.001	-	-	100	0.000	0.000	0.000
32.000	User	-	100	0.026	0.026	0.026
32.001	-	-	100	0.000	0.000	0.000
31.002	User	-	100	0.007	0.007	0.007
33.000	User	-	100	0.046	0.046	0.046
33.001	-	-	100	0.000	0.000	0.000
31.003	User	-	100	0.007	0.007	0.007
34.000	User	-	100	0.009	0.009	0.009
	User	-	100	0.017	0.017	0.026
35.000	User	-	100	0.025	0.025	0.025
35.001	-	-	100	0.000	0.000	0.000
31.004	User	-	100	0.018	0.018	0.018
31.005	-	-	100	0.000	0.000	0.000
36.000	-	-	100	0.000	0.000	0.000
19.008	User	-	100	0.050	0.050	0.050
19.009	-	-	100	0.000	0.000	0.000
37.000	User	-	100	0.050	0.050	0.050

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
37.001	-	-	100	0.000	0.000	0.000
37.002	User	-	100	0.008	0.008	0.008
37.003	User	-	100	0.026	0.026	0.026
	User	-	100	0.021	0.021	0.047
38.000	User	-	100	0.021	0.021	0.021
38.001	-	-	100	0.000	0.000	0.000
39.000	User	-	100	0.043	0.043	0.043
39.001	-	-	100	0.000	0.000	0.000
37.004	-	-	100	0.000	0.000	0.000
40.000	User	-	100	0.030	0.030	0.030
40.001	-	-	100	0.000	0.000	0.000
41.000	User	-	100	0.031	0.031	0.031
41.001	-	-	100	0.000	0.000	0.000
37.005	User	-	100	0.027	0.027	0.027
	User	-	100	0.016	0.016	0.043
42.000	User	-	100	0.050	0.050	0.050
42.001	-	-	100	0.000	0.000	0.000
42.002	User	-	100	0.019	0.019	0.019
42.003	-	-	100	0.000	0.000	0.000
43.000	User	-	100	0.060	0.060	0.060
43.001	-	-	100	0.000	0.000	0.000
42.004	User	-	100	0.015	0.015	0.015
	User	-	100	0.019	0.019	0.034
44.000	User	-	100	0.063	0.063	0.063
44.001	-	-	100	0.000	0.000	0.000
42.005	User	-	100	0.024	0.024	0.024
45.000	User	-	100	0.025	0.025	0.025
45.001	-	-	100	0.000	0.000	0.000
46.000	User	-	100	0.061	0.061	0.061
46.001	-	-	100	0.000	0.000	0.000
42.006	-	-	100	0.000	0.000	0.000
47.000	User	-	100	0.050	0.050	0.050
47.001	-	-	100	0.000	0.000	0.000
48.000	User	-	100	0.044	0.044	0.044
48.001	-	-	100	0.000	0.000	0.000
37.006	-	-	100	0.000	0.000	0.000
49.000	User	-	100	0.036	0.036	0.036
49.001	-	-	100	0.000	0.000	0.000
37.007	-	-	100	0.000	0.000	0.000
50.000	-	-	100	0.000	0.000	0.000

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
51.000	User	-	100	0.026	0.026	0.026
51.001	-	-	100	0.000	0.000	0.000
52.000	User	-	100	0.034	0.034	0.034
52.001	-	-	100	0.000	0.000	0.000
37.008	-	-	100	0.000	0.000	0.000
37.009	-	-	100	0.000	0.000	0.000
53.000	User	-	100	0.017	0.017	0.017
53.001	-	-	100	0.000	0.000	0.000
54.000	User	-	100	0.017	0.017	0.017
53.002	-	-	100	0.000	0.000	0.000
55.000	User	-	100	0.015	0.015	0.015
56.000	User	-	100	0.056	0.056	0.056
56.001	-	-	100	0.000	0.000	0.000
53.003	-	-	100	0.000	0.000	0.000
57.000	User	-	100	0.016	0.016	0.016
58.000	User	-	100	0.047	0.047	0.047
58.001	-	-	100	0.000	0.000	0.000
53.004	-	-	100	0.000	0.000	0.000
59.000	User	-	100	0.049	0.049	0.049
59.001	-	-	100	0.000	0.000	0.000
59.002	User	-	100	0.016	0.016	0.016
60.000	User	-	100	0.014	0.014	0.014
53.005	User	-	100	0.014	0.014	0.014
61.000	User	-	100	0.027	0.027	0.027
61.001	-	-	100	0.000	0.000	0.000
53.006	-	-	100	0.000	0.000	0.000
62.000	User	-	100	0.020	0.020	0.020
63.000	User	-	100	0.040	0.040	0.040
63.001	-	-	100	0.000	0.000	0.000
53.007	User	-	100	0.007	0.007	0.007
64.000	User	-	100	0.050	0.050	0.050
64.001	-	-	100	0.000	0.000	0.000
53.008	-	-	100	0.000	0.000	0.000
65.000	User	-	100	0.041	0.041	0.041
65.001	-	-	100	0.000	0.000	0.000
65.002	-	-	100	0.000	0.000	0.000
53.009	User	-	100	0.018	0.018	0.018
	User	-	100	0.018	0.018	0.037
66.000	User	-	100	0.035	0.035	0.035
66.001	-	-	100	0.000	0.000	0.000

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
53.010	-	-	100	0.000	0.000	0.000
53.011	User	-	100	0.012	0.012	0.012
67.000	-	-	100	0.000	0.000	0.000
53.012	-	-	100	0.000	0.000	0.000
53.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				3.967	3.967	3.967

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.005	SW MH	17.600	15.077	14.900	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S6.011	SW MH	15.400	13.310	13.300	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S19.009	SW MH	14.250	12.113	12.100	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S37.009	SW MH	13.650	11.648	11.300	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S53.013	SW MH	11.800	9.683	9.480	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	46	Number of Storage Structures	60	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	15.000	Cv (Summer)	0.750
Return Period (years)	5	Ratio R	0.300	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SW MH17, DS/PN: S1.005, Volume (m³): 4.3

Unit Reference	MD-SHE-0070-2500-1400-2500	Sump Available	Yes
Design Head (m)	1.400	Diameter (mm)	70
Design Flow (l/s)	2.5	Invert Level (m)	15.104
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	2.5	Kick-Flo®	0.621	1.7
Flush-Flo™	0.307	2.1	Mean Flow over Head Range	-	2.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.8	0.600	1.8	1.600	2.7	2.600	3.3	5.000	4.5	7.500	5.4
0.200	2.1	0.800	1.9	1.800	2.8	3.000	3.5	5.500	4.7	8.000	5.6
0.300	2.1	1.000	2.1	2.000	2.9	3.500	3.8	6.000	4.9	8.500	5.8
0.400	2.1	1.200	2.3	2.200	3.1	4.000	4.1	6.500	5.1	9.000	5.9
0.500	2.0	1.400	2.5	2.400	3.2	4.500	4.3	7.000	5.3	9.500	6.1

Orifice Manhole: SW MHD20, DS/PN: S7.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.974

Orifice Manhole: SW MHD21, DS/PN: S8.001, Volume (m³): 0.9

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.983

Orifice Manhole: SW MHD22, DS/PN: S9.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.275

Orifice Manhole: SW MHD23, DS/PN: S10.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.473

Orifice Manhole: SW MHD24, DS/PN: S11.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.061

Orifice Manhole: SW MHD24.1, DS/PN: S12.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.171

Orifice Manhole: SW MHD26, DS/PN: S13.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.981

Orifice Manhole: SW MHD28, DS/PN: S14.001, Volume (m³): 0.9

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.756

Orifice Manhole: SW MHD30, DS/PN: S15.001, Volume (m³): 0.9

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.239

Hydro-Brake® Optimum Manhole: SW MH34, DS/PN: S16.001, Volume (m³): 3.7

Unit Reference	MD-SHE-0056-1400-1000-1400	Sump Available	Yes
Design Head (m)	1.000	Diameter (mm)	56
Design Flow (l/s)	1.4	Invert Level (m)	14.704
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	75
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.4	Kick-Flo®	0.497	1.0
Flush-Flo™	0.245	1.3	Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Hydro-Brake® Optimum Manhole: SW MH34, DS/PN: S16.001, Volume (m³): 3.7

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.1	0.600	1.1	1.600	1.7	2.600	2.2	5.000	2.9	7.500	3.5
0.200	1.2	0.800	1.3	1.800	1.8	3.000	2.3	5.500	3.1	8.000	3.6
0.300	1.2	1.000	1.4	2.000	1.9	3.500	2.5	6.000	3.2	8.500	3.7
0.400	1.2	1.200	1.5	2.200	2.0	4.000	2.6	6.500	3.3	9.000	3.8
0.500	1.0	1.400	1.6	2.400	2.1	4.500	2.8	7.000	3.4	9.500	3.9

Hydro-Brake® Optimum Manhole: SW MH38, DS/PN: S6.011, Volume (m³): 5.2

Unit Reference	MD-SHE-0091-4500-1600-4500	Sump Available	Yes
Design Head (m)	1.600	Diameter (mm)	91
Design Flow (l/s)	4.5	Invert Level (m)	13.428
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	4.5	Kick-Flo®	0.817	3.3
Flush-Flo™	0.399	4.1	Mean Flow over Head Range	-	3.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.9	0.600	4.0	1.600	4.5	2.600	5.6	5.000	7.7	7.500	9.3
0.200	3.8	0.800	3.4	1.800	4.7	3.000	6.0	5.500	8.0	8.000	9.6
0.300	4.1	1.000	3.6	2.000	5.0	3.500	6.5	6.000	8.4	8.500	9.9
0.400	4.1	1.200	3.9	2.200	5.2	4.000	6.9	6.500	8.7	9.000	10.1
0.500	4.1	1.400	4.2	2.400	5.4	4.500	7.3	7.000	9.0	9.500	10.4

Orifice Manhole: SW MHD39, DS/PN: S19.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.118

Orifice Manhole: SW MHD40, DS/PN: S20.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.978

Orifice Manhole: SW MHD41, DS/PN: S21.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.964

Orifice Manhole: SW MHD42, DS/PN: S22.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.565

Orifice Manhole: SW MHD44, DS/PN: S23.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.265

Orifice Manhole: SW MHD45, DS/PN: S24.001, Volume (m³): 0.9

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.401

Orifice Manhole: SW MHD46, DS/PN: S25.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.362

Orifice Manhole: SW MHD47, DS/PN: S26.001, Volume (m³): 0.6

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.577

Orifice Manhole: SW MHD50, DS/PN: S30.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 14.179

Orifice Manhole: SW MHD51.1, DS/PN: S31.001, Volume (m³): 1.0

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.958

Orifice Manhole: SW MHD51, DS/PN: S32.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.220

Orifice Manhole: SW MHD52, DS/PN: S33.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.159

Orifice Manhole: SW MHD54, DS/PN: S35.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.532

Hydro-Brake® Optimum Manhole: SW MH58, DS/PN: S19.009, Volume (m³): 7.1

Unit Reference	MD-SHE-0094-5100-1900-5100	Sump Available	Yes
Design Head (m)	1.900	Diameter (mm)	94
Design Flow (l/s)	5.1	Invert Level (m)	12.145
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.900	5.1	Kick-Flo®	0.838	3.5
Flush-Flo™	0.412	4.4	Mean Flow over Head Range	-	4.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	0.600	4.2	1.600	4.7	2.600	5.9	5.000	8.0	7.500	9.7
0.200	4.0	0.800	3.7	1.800	5.0	3.000	6.3	5.500	8.4	8.000	10.0
0.300	4.3	1.000	3.8	2.000	5.2	3.500	6.8	6.000	8.7	8.500	10.3
0.400	4.4	1.200	4.1	2.200	5.5	4.000	7.2	6.500	9.1	9.000	10.6
0.500	4.3	1.400	4.4	2.400	5.7	4.500	7.6	7.000	9.4	9.500	10.9

Orifice Manhole: SW MH110, DS/PN: S37.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.845

Orifice Manhole: SW MHD61, DS/PN: S38.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.478

Orifice Manhole: SW MHD62, DS/PN: S40.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.343

Orifice Manhole: SW MHD62.1, DS/PN: S41.001, Volume (m³): 1.0

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.055

Orifice Manhole: SW MHD63, DS/PN: S42.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.865

Orifice Manhole: SW MHD65, DS/PN: S43.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.352

Orifice Manhole: SW MHD66, DS/PN: S44.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.051

Orifice Manhole: SW MHD68.1, DS/PN: S47.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.114

Orifice Manhole: SW MHD68, DS/PN: S48.001, Volume (m³): 1.0

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 14.892

Orifice Manhole: SW MHD71, DS/PN: S52.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 13.359

Hydro-Brake® Optimum Manhole: SW MH72, DS/PN: S37.009, Volume (m³): 3.6

Unit Reference	MD-SHE-0092-4300-1400-4300	Sump Available	Yes
Design Head (m)	1.400	Diameter (mm)	92
Design Flow (l/s)	4.3	Invert Level (m)	11.670
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	4.3	Kick-Flo®	0.824	3.4
Flush-Flo™	0.407	4.2	Mean Flow over Head Range	-	3.7

Hydro-Brake® Optimum Manhole: SW MH72, DS/PN: S37.009, Volume (m³): 3.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.9	0.600	4.1	1.600	4.6	2.600	5.7	5.000	7.8	7.500	9.4
0.200	3.9	0.800	3.5	1.800	4.8	3.000	6.1	5.500	8.2	8.000	9.7
0.300	4.1	1.000	3.7	2.000	5.1	3.500	6.6	6.000	8.5	8.500	10.0
0.400	4.2	1.200	4.0	2.200	5.3	4.000	7.0	6.500	8.8	9.000	10.3
0.500	4.2	1.400	4.3	2.400	5.5	4.500	7.4	7.000	9.1	9.500	10.6

Orifice Manhole: SW MHD74, DS/PN: S56.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.826

Orifice Manhole: SW MHD75, DS/PN: S58.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 16.509

Orifice Manhole: SW MHD76, DS/PN: S59.001, Volume (m³): 0.5

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.768

Orifice Manhole: SW MHD78, DS/PN: S61.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 15.062

Orifice Manhole: SW MHD80, DS/PN: S63.001, Volume (m³): 0.8

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 14.574

Orifice Manhole: SW MHD81, DS/PN: S64.001, Volume (m³): 0.7

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 14.233

Orifice Manhole: SW MHD82, DS/PN: S65.001, Volume (m³): 1.3

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 14.135

Orifice Manhole: SW MHD84, DS/PN: S66.001, Volume (m³): 0.6

Diameter (m) 0.040 Discharge Coefficient 0.600 Invert Level (m) 13.883

Hydro-Brake® Optimum Manhole: SW MH86, DS/PN: S53.012, Volume (m³): 6.0

Unit Reference	MD-SHE-0077-2900-1250-2900	Sump Available	Yes
Design Head (m)	1.250	Diameter (mm)	77
Design Flow (l/s)	2.9	Invert Level (m)	9.829
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.250	2.9	Kick-Flo®	0.690	2.2
Flush-Flo™	0.339	2.7	Mean Flow over Head Range	-	2.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.2	0.600	2.5	1.600	3.2	2.600	4.1	5.000	5.5	7.500	6.7
0.200	2.6	0.800	2.4	1.800	3.4	3.000	4.3	5.500	5.8	8.000	6.9
0.300	2.7	1.000	2.6	2.000	3.6	3.500	4.7	6.000	6.0	8.500	7.1
0.400	2.7	1.200	2.8	2.200	3.8	4.000	5.0	6.500	6.2	9.000	7.3
0.500	2.7	1.400	3.1	2.400	3.9	4.500	5.3	7.000	6.5	9.500	7.5

Storage Structures for Storm

Tank or Pond Manhole: SW MH17, DS/PN: S1.005

Invert Level (m) 15.104

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	550.0	1.000	550.0	1.001	0.0

Porous Car Park Manhole: SW MHDP19, DS/PN: S6.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.200	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP20, DS/PN: S7.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.000	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP21, DS/PN: S8.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.000	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP22, DS/PN: S9.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.300	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP23, DS/PN: S10.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.500	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP24, DS/PN: S11.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.100	Depression Storage (mm)	5
Max Percolation (l/s)	16.7	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	12.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP24.1, DS/PN: S12.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.200	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP26, DS/PN: S13.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.020	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP28, DS/PN: S14.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.800	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP30, DS/PN: S15.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.290	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Tank or Pond Manhole: SW MH34, DS/PN: S16.001

Invert Level (m) 14.704

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	300.0	0.800	300.0	0.801	0.0

Tank or Pond Manhole: SW MH38, DS/PN: S6.011

Invert Level (m) 13.553

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.350	200.0	1.351	0.0

Porous Car Park Manhole: SW MHDP39, DS/PN: S19.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.150	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP40, DS/PN: S20.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.000	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP41, DS/PN: S21.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.000	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP42, DS/PN: S22.000

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Porosity	0.30	Length (m)	32.0
Max Percolation (l/s)	44.4	Invert Level (m)	16.600	Slope (1:X)	150.0

Porous Car Park Manhole: SW MHDP42, DS/PN: S22.000

Depression Storage (mm) 5 Evaporation (mm/day) 3 Cap Volume Depth (m) 0.350

Porous Car Park Manhole: SW MHDP44, DS/PN: S23.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.300	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP45, DS/PN: S24.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.450	Depression Storage (mm)	5
Max Percolation (l/s)	20.8	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	15.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP46, DS/PN: S25.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.400	Depression Storage (mm)	5
Max Percolation (l/s)	22.2	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP47, DS/PN: S26.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.600	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Swale Manhole: SW MH-Swale1, DS/PN: S27.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	15.600	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	20.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Swale Manhole: SW MH-Swale2, DS/PN: S28.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	15.500	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	20.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Swale Manhole: SW MH-Swale3, DS/PN: S29.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	14.400	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	15.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Porous Car Park Manhole: SW MHDP50, DS/PN: S30.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	14.200	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP51.1, DS/PN: S31.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.000	Depression Storage (mm)	5
Max Percolation (l/s)	22.2	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP51, DS/PN: S32.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.250	Depression Storage (mm)	5
Max Percolation (l/s)	22.2	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP52, DS/PN: S33.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.200	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP54, DS/PN: S35.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.600	Depression Storage (mm)	5
Max Percolation (l/s)	22.2	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.350

Tank or Pond Manhole: SW MH58, DS/PN: S19.009

Invert Level (m) 13.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	380.0	1.200	380.0	1.201	0.0

Porous Car Park Manhole: SW MH109, DS/PN: S37.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.900	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP61, DS/PN: S38.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.500	Depression Storage (mm)	5
Max Percolation (l/s)	16.7	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	12.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP61.1, DS/PN: S39.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.500	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP62, DS/PN: S40.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.400	Depression Storage (mm)	5
Max Percolation (l/s)	16.7	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	12.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP62.1, DS/PN: S41.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.100	Depression Storage (mm)	5
Max Percolation (l/s)	22.2	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP63, DS/PN: S42.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.900	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP65, DS/PN: S43.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.400	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP66, DS/PN: S44.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.100	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Swale Manhole: SW MH-Swale4, DS/PN: S45.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	1.00	Length (m)	25.0
Infiltration Coefficient Side (m/hr)	0.00000	Invert Level (m)	15.200	Side Slope (1:X)	3.0
Safety Factor	2.0	Base Width (m)	1.0	Slope (1:X)	150.0

Swale Manhole: SW MH-Swale4, DS/PN: S45.000

Cap Volume Depth (m) 0.000 Cap Infiltration Depth (m) 0.000 Include Swale Volume Yes

Porous Car Park Manhole: SW MHDP67, DS/PN: S46.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.500	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP68.1, DS/PN: S47.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.200	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP68, DS/PN: S48.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	14.950	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Swale Manhole: SW MH-Swale6, DS/PN: S49.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	14.500	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	23.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Swale Manhole: SW MH-Swale8, DS/PN: S51.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	13.600	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	23.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Porous Car Park Manhole: SW MHD71, DS/PN: S52.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	13.400	Depression Storage (mm)	5
Max Percolation (l/s)	22.2	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.350

Tank or Pond Manhole: SW MH72, DS/PN: S37.009

Invert Level (m) 11.887

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	400.0	1.000	400.0	1.001	0.0

Swale Manhole: SW MH-Swale10, DS/PN: S53.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	16.700	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	20.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Swale Manhole: SW MH-Swale11, DS/PN: S54.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	16.000	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	20.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Swale Manhole: SW MH-Swale12, DS/PN: S55.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	16.300	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	20.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Porous Car Park Manhole: SW MHDP74, DS/PN: S56.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.850	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Swale Manhole: SW MH-Swale13, DS/PN: S57.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	16.700	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	20.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Porous Car Park Manhole: SW MHDP75, DS/PN: S58.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	16.530	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP76, DS/PN: S59.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.800	Depression Storage (mm)	5
Max Percolation (l/s)	44.4	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	32.0	Cap Volume Depth (m)	0.350

Swale Manhole: SW MH-Swale13, DS/PN: S60.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	15.600	Slope (1:X)	150.0
Infiltration Coefficient Side (m/hr)	0.00000	Base Width (m)	0.5	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Length (m)	20.0	Cap Infiltration Depth (m)	0.000
Porosity	1.00	Side Slope (1:X)	3.0	Include Swale Volume	Yes

Porous Car Park Manhole: SW MHDP78, DS/PN: S61.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	15.100	Depression Storage (mm)	5
Max Percolation (l/s)	22.2	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	16.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP80, DS/PN: S63.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	14.600	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP81, DS/PN: S64.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	14.250	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP82, DS/PN: S65.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	14.200	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SW MHDP84, DS/PN: S66.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	150.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	13.900	Depression Storage (mm)	5
Max Percolation (l/s)	33.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	24.0	Cap Volume Depth (m)	0.350

Tank or Pond Manhole: SW MH86, DS/PN: S53.012

Invert Level (m) 9.979

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	280.0	1.000	280.0	1.001	0.0

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	46	Number of Storage Structures	60	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	15.000
Region	Scotland and Ireland	Ratio R	0.300
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm)	350.0	DVD Status	ON
Analysis Timestep	2.5 Second Increment (Extended)	Inertia Status	ON
DTS Status	OFF		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SW MH1	15 Winter	100	+30%	100/15 Summer				16.317	0.111	0.000	0.04			2.2	SURCHARGED
S2.000	SW MH2	15 Winter	100	+30%	30/15 Summer				16.687	0.562	0.000	0.09			6.2	FLOOD RISK
S2.001	SW MH3	15 Winter	100	+30%	30/15 Summer				16.679	0.720	0.000	0.38			25.4	SURCHARGED
S3.000	SW MH4	15 Winter	100	+30%	100/15 Winter				17.087	0.087	0.000	0.27			24.2	SURCHARGED
S3.001	SW MH5	15 Winter	100	+30%	100/15 Summer				17.071	0.197	0.000	0.59			58.5	SURCHARGED
S3.002	SW MH6	15 Winter	100	+30%	100/15 Summer				16.927	0.292	0.000	0.86			82.2	SURCHARGED
S3.003	SW MH7	15 Winter	100	+30%	100/15 Summer				16.785	0.334	0.000	0.57			80.4	SURCHARGED
S2.002	SW MH8	15 Winter	100	+30%	30/15 Summer				16.591	0.766	0.000	1.33			90.5	SURCHARGED
S4.000	SW MH9	15 Winter	100	+30%					16.840	-0.160	0.000	0.18			9.9	OK
S4.001	SW MH10	15 Winter	100	+30%					16.462	-0.065	0.000	0.62			35.9	OK
S4.002	SW MH11	15 Winter	100	+30%	100/15 Summer				16.413	0.169	0.000	0.79			38.9	SURCHARGED
S1.001	SW MH12	15 Winter	100	+30%	30/15 Summer				16.318	0.579	0.000	1.56			124.8	SURCHARGED
S1.002	SW MHPI	15 Winter	100	+30%	5/15 Summer				16.228	0.577	0.000	1.57			125.8	SURCHARGED
S1.003	SW MH13	15 Winter	100	+30%	30/15 Summer				16.140	0.478	0.000	1.55			164.5	SURCHARGED

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Level Exceeded
S1.000	SW MH1	
S2.000	SW MH2	
S2.001	SW MH3	
S3.000	SW MH4	
S3.001	SW MH5	
S3.002	SW MH6	
S3.003	SW MH7	
S2.002	SW MH8	
S4.000	SW MH9	
S4.001	SW MH10	
S4.002	SW MH11	
S1.001	SW MH12	
S1.002	SW MHPI	
S1.003	SW MH13	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S5.000	SW MH14	15 Winter	100	+30%					16.200	-0.175	0.000	0.11			6.0
S5.001	SW MH15	2160 Winter	100	+30%	100/720 Winter				15.924	0.085	0.000	0.01			0.5
S1.004	SW MH16	2160 Winter	100	+30%	5/15 Summer				15.924	0.426	0.000	0.17			12.7
S1.005	SW MH17	2160 Winter	100	+30%	5/600 Winter				15.923	0.444	0.000	0.03			2.1
S6.000	SW MHDP19	15 Winter	100	+30%					16.318	-0.032	0.000	0.97		5	10.5
S6.001	SW MHD19	15 Winter	100	+30%					16.290	-0.032	0.000	0.97			10.5
S6.002	SW MH19	15 Winter	100	+30%					15.457	-0.068	0.000	0.58			10.5
S7.000	SW MHDP20	60 Winter	100	+30%	5/60 Winter				16.273	0.123	0.000	0.16		52	1.8
S7.001	SW MHD20	60 Winter	100	+30%	5/15 Winter				16.270	0.145	0.000	0.16			1.8
S6.003	SW MH20	600 Winter	100	+30%	100/480 Winter				15.449	0.241	0.000	0.18			3.7
S8.000	SW MHDP21	120 Winter	100	+30%	5/30 Winter				16.267	0.117	0.000	0.17		66	1.7
S8.001	SW MHD21	120 Winter	100	+30%	5/30 Summer				16.264	0.131	0.000	0.16			1.7
S8.002	SW MH21	15 Winter	100	+30%					15.504	-0.096	0.000	0.27			4.3
S9.000	SW MHDP22	60 Winter	100	+30%	30/15 Winter				16.530	0.080	0.000	0.15		46	1.6
S9.001	SW MHD22	60 Winter	100	+30%	5/30 Winter				16.528	0.102	0.000	0.15			1.6
S8.003	SW MH22	15 Winter	100	+30%					15.460	-0.051	0.000	0.75			12.7
S10.000	SW MHDP23	60 Winter	100	+30%	30/30 Summer				16.725	0.075	0.000	0.15		45	1.6
S10.001	SW MHD23	60 Winter	100	+30%	5/30 Winter				16.723	0.099	0.000	0.15			1.6
S8.004	SW MH23	600 Winter	100	+30%	100/480 Winter				15.452	0.159	0.000	0.10			4.7
S11.000	SW MHDP24	60 Winter	100	+30%	30/15 Winter				16.350	0.100	0.000	0.14		36	1.8
S11.001	SW MHD24	60 Winter	100	+30%	5/30 Winter				16.347	0.137	0.000	0.14			1.7
S12.000	SW MHDP24.1	120 Winter	100	+30%	5/15 Summer				16.578	0.228	0.000	0.19		76	2.1
S12.001	SW MHD24.1	120 Winter	100	+30%	5/15 Summer				16.574	0.253	0.000	0.19			2.1
S8.005	SW MH24	600 Winter	100	+30%	100/480 Winter				15.449	0.366	0.000	0.17			8.3
S6.004	SW MH25	600 Winter	100	+30%	100/360 Winter				15.445	0.588	0.000	0.13			13.6
S13.000	SW MHDP26	120 Winter	100	+30%	5/15 Winter				16.341	0.171	0.000	0.16		75	1.9
S13.001	SW MHD26	120 Winter	100	+30%	5/15 Summer				16.337	0.206	0.000	0.16			1.9
S6.005	SW MH26	600 Winter	100	+30%	100/240 Winter				15.442	0.700	0.000	0.12			15.1
S6.006	SW MH27	600 Winter	100	+30%	30/360 Winter				15.440	0.890	0.000	0.16			18.0
S14.000	SW MHDP28	120 Winter	100	+30%	5/60 Winter				16.062	0.112	0.000	0.14		62	1.8
S14.001	SW MHD28	120 Winter	100	+30%	5/15 Summer				16.059	0.152	0.000	0.14			1.8
S6.007	SW MH28	600 Winter	100	+30%	30/240 Winter				15.438	0.985	0.000	0.19			19.0
S6.008	SW MH29	600 Winter	100	+30%	30/180 Winter				15.435	1.040	0.000	0.10			18.9
S15.000	SW MHDP30	120 Winter	100	+30%	5/60 Winter				15.551	0.111	0.000	0.13		62	1.8
S15.001	SW MHD30	120 Winter	100	+30%	5/15 Summer				15.548	0.158	0.000	0.13			1.8
S6.009	SW MH30	600 Winter	100	+30%	5/240 Winter				15.433	1.274	0.000	0.12			23.1
S16.000	SW MH31	15 Winter	100	+30%	30/15 Summer				16.631	0.706	0.000	1.28			36.0
S17.000	SW MH32	15 Winter	100	+30%					16.047	-0.103	0.000	0.56			38.5

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S5.000	SW MH14	OK	
S5.001	SW MH15	SURCHARGED	
S1.004	SW MH16	SURCHARGED	
S1.005	SW MH17	SURCHARGED	
S6.000	SW MHDP19	OK	
S6.001	SW MHD19	OK	
S6.002	SW MH19	OK	
S7.000	SW MHDP20	FLOOD RISK	
S7.001	SW MHD20	FLOOD RISK	
S6.003	SW MH20	SURCHARGED	
S8.000	SW MHDP21	FLOOD RISK	
S8.001	SW MHD21	SURCHARGED	
S8.002	SW MH21	OK	
S9.000	SW MHDP22	SURCHARGED	
S9.001	SW MHD22	SURCHARGED	
S8.003	SW MH22	OK	
S10.000	SW MHDP23	SURCHARGED	
S10.001	SW MHD23	FLOOD RISK	
S8.004	SW MH23	SURCHARGED	
S11.000	SW MHDP24	SURCHARGED	
S11.001	SW MHD24	SURCHARGED	
S12.000	SW MHDP24.1	FLOOD RISK	
S12.001	SW MHD24.1	FLOOD RISK	
S8.005	SW MH24	SURCHARGED	
S6.004	SW MH25	SURCHARGED	
S13.000	SW MHDP26	FLOOD RISK	
S13.001	SW MHD26	FLOOD RISK	
S6.005	SW MH26	SURCHARGED	
S6.006	SW MH27	SURCHARGED	
S14.000	SW MHDP28	FLOOD RISK	
S14.001	SW MHD28	SURCHARGED	
S6.007	SW MH28	SURCHARGED	
S6.008	SW MH29	SURCHARGED	
S15.000	SW MHDP30	FLOOD RISK	
S15.001	SW MHD30	SURCHARGED	
S6.009	SW MH30	SURCHARGED	
S16.000	SW MH31	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S17.000	SW MH32	OK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S17.001	SW MH33	1440 Winter	100	+30%	30/15 Summer				15.812	0.381	0.000	0.08			5.8
S16.001	SW MH34	1440 Winter	100	+30%	5/30 Winter				15.811	0.957	0.000	0.02			1.3
S6.010	SW MH35	600 Winter	100	+30%	5/60 Winter				15.431	1.506	0.000	0.17			23.9
S18.000	SW MH36	600 Winter	100	+30%	100/480 Winter				15.429	0.129	0.000	0.02			0.6
S18.001	SW MH37	600 Winter	100	+30%	30/360 Winter				15.429	0.904	0.000	0.05			1.0
S6.011	SW MH38	600 Winter	100	+30%	5/30 Winter				15.428	1.625	0.000	0.04			5.0
S19.000	SW MHDP39	120 Winter	100	+30%	5/30 Winter				16.415	0.115	0.000	0.16		64	1.8
S19.001	SW MHD39	120 Winter	100	+30%	5/15 Summer				16.413	0.144	0.000	0.16			1.7
S19.002	SW MH39	15 Winter	100	+30%					15.312	-0.088	0.000	0.36			7.0
S20.000	SW MHDP40	120 Winter	100	+30%	5/60 Winter				16.254	0.104	0.000	0.16		62	1.7
S20.001	SW MHD40	120 Winter	100	+30%	5/30 Summer				16.251	0.123	0.000	0.15			1.7
S19.003	SW MH40	15 Winter	100	+30%					15.033	-0.054	0.000	0.73			12.0
S21.000	SW MHDP41	120 Winter	100	+30%	5/60 Winter				16.262	0.112	0.000	0.15		63	1.8
S21.001	SW MHD41	120 Winter	100	+30%	5/15 Summer				16.259	0.146	0.000	0.15			1.8
S19.004	SW MH41	15 Winter	100	+30%					14.832	-0.109	0.000	0.52			20.0
S22.000	SW MHDP42	120 Winter	100	+30%	5/15 Summer				17.062	0.312	0.000	0.20		95	2.3
S22.001	SW MHD42	120 Winter	100	+30%	5/15 Summer				17.059	0.344	0.000	0.20			2.3
S22.002	SW MH42	15 Winter	100	+30%					15.931	-0.069	0.000	0.56			9.6
S22.003	SW MH43	15 Winter	100	+30%					15.380	-0.101	0.000	0.57			17.3
S23.000	SW MHDP44	120 Winter	100	+30%	5/30 Winter				16.585	0.135	0.000	0.16		68	1.8
S23.001	SW MHD44	120 Winter	100	+30%	5/15 Summer				16.582	0.167	0.000	0.16			1.8
S23.002	SW MH44	15 Winter	100	+30%	100/15 Summer				15.662	0.062	0.000	1.07			18.4
S24.000	SW MHDP45	60 Winter	100	+30%	30/15 Winter				16.718	0.118	0.000	0.13		41	1.9
S24.001	SW MHD45	60 Winter	100	+30%	5/15 Summer				16.714	0.163	0.000	0.13			1.8
S22.004	SW MH45	15 Winter	100	+30%					14.722	-0.116	0.000	0.58			41.0
S25.000	SW MHDP46	60 Winter	100	+30%	30/15 Winter				16.670	0.120	0.000	0.15		43	1.8
S25.001	SW MHD46	60 Winter	100	+30%	5/15 Winter				16.667	0.155	0.000	0.15			1.8
S22.005	SW MH46	15 Winter	100	+30%					14.672	-0.083	0.000	0.87			52.4
S26.000	SW MHDP47	120 Winter	100	+30%	5/30 Summer				16.899	0.149	0.000	0.18		71	1.8
S26.001	SW MHD47	120 Winter	100	+30%	5/15 Summer				16.895	0.168	0.000	0.17			1.8
S22.006	SW MH47	15 Winter	100	+30%					14.540	-0.169	0.000	0.39			53.4
S27.000	SW MH-Swale1	15 Winter	100	+30%					15.661	-0.089	0.000	0.34		5	5.2
S19.005	SW MH48	15 Winter	100	+30%	100/15 Summer				14.198	0.022	0.000	0.87			76.0
S28.000	SW MH-Swale2	15 Winter	100	+30%					15.572	-0.078	0.000	0.47		5	6.9
S19.006	SW MH49	15 Winter	100	+30%	100/15 Summer				14.082	0.035	0.000	0.76			81.6
S29.000	SW MH-Swale3	15 Winter	100	+30%					14.465	-0.085	0.000	0.39		5	5.8
S30.000	SW MHDP50	120 Winter	100	+30%	5/30 Summer				14.500	0.150	0.000	0.19		72	1.8
S30.001	SW MHD50	120 Winter	100	+30%	5/15 Summer				14.496	0.168	0.000	0.17			1.8

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S17.001	SW MH33	SURCHARGED	
S16.001	SW MH34	SURCHARGED	
S6.010	SW MH35	SURCHARGED	
S18.000	SW MH36	SURCHARGED	
S18.001	SW MH37	SURCHARGED	
S6.011	SW MH38	FLOOD RISK	
S19.000	SW MHDP39	FLOOD RISK	
S19.001	SW MHD39	FLOOD RISK	
S19.002	SW MH39	OK	
S20.000	SW MHDP40	FLOOD RISK	
S20.001	SW MHD40	FLOOD RISK	
S19.003	SW MH40	OK	
S21.000	SW MHDP41	FLOOD RISK	
S21.001	SW MHD41	FLOOD RISK	
S19.004	SW MH41	OK	
S22.000	SW MHDP42	FLOOD RISK	
S22.001	SW MHD42	FLOOD RISK	
S22.002	SW MH42	OK	
S22.003	SW MH43	OK	
S23.000	SW MHDP44	FLOOD RISK	
S23.001	SW MHD44	FLOOD RISK	
S23.002	SW MH44	SURCHARGED	
S24.000	SW MHDP45	FLOOD RISK	
S24.001	SW MHD45	SURCHARGED	
S22.004	SW MH45	OK	
S25.000	SW MHDP46	FLOOD RISK	
S25.001	SW MHD46	FLOOD RISK	
S22.005	SW MH46	OK	
S26.000	SW MHDP47	FLOOD RISK	
S26.001	SW MHD47	FLOOD RISK	
S22.006	SW MH47	OK	
S27.000	SW MH-Swale1	OK	
S19.005	SW MH48	SURCHARGED	
S28.000	SW MH-Swale2	OK	
S19.006	SW MH49	SURCHARGED	
S29.000	SW MH-Swale3	OK	
S30.000	SW MHDP50	FLOOD RISK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S30.001	SW MHD50	FLOOD RISK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S19.007	SW MH50	15 Winter	100	+30%	30/15 Summer				13.991	0.073	0.000	1.48			88.2
S31.000	SW MHDP51.1	60 Winter	100	+30%	30/30 Winter				16.210	0.060	0.000	0.13		37	1.6
S31.001	SW MHD51.1	60 Winter	100	+30%	30/15 Summer				16.208	0.099	0.000	0.13			1.6
S32.000	SW MHDP51	60 Winter	100	+30%	30/30 Winter				16.465	0.065	0.000	0.15		38	1.6
S32.001	SW MHD51	60 Winter	100	+30%	30/15 Summer				16.463	0.093	0.000	0.14			1.6
S31.002	SW MH51	15 Winter	100	+30%					15.617	-0.108	0.000	0.17			5.3
S33.000	SW MHDP52	120 Winter	100	+30%	5/30 Summer				16.517	0.167	0.000	0.15		67	2.0
S33.001	SW MHD52	120 Winter	100	+30%	5/15 Summer				16.514	0.206	0.000	0.15			1.9
S31.003	SW MH52	15 Winter	100	+30%					14.773	-0.088	0.000	0.35			9.4
S34.000	SW MH53	15 Winter	100	+30%					15.637	-0.088	0.000	0.35			10.2
S35.000	SW MHDP54	60 Winter	100	+30%	100/15 Winter				15.793	0.043	0.000	0.10		33	1.7
S35.001	SW MHD54	60 Winter	100	+30%	5/15 Winter				15.791	0.109	0.000	0.10			1.6
S31.004	SW MH54	15 Winter	100	+30%					14.176	-0.129	0.000	0.37			28.3
S31.005	SW MH55	720 Winter	100	+30%	30/360 Winter				13.970	0.326	0.000	0.12			6.3
S36.000	SW MH56	15 Summer	5	+30%					14.000	-0.150	0.000	0.00			0.0
S19.008	SW MH57	720 Winter	100	+30%	5/15 Summer				13.968	1.273	0.000	0.17			27.9
S19.009	SW MH58	720 Winter	100	+30%	5/15 Summer				13.966	1.371	0.000	0.04			5.0
S37.000	SW MH109	120 Winter	100	+30%	5/30 Summer				17.206	0.156	0.000	0.13		71	2.0
S37.001	SW MH110	120 Winter	100	+30%	5/15 Summer				17.203	0.209	0.000	0.13			1.9
S37.002	SW MH59	15 Winter	100	+30%					16.203	-0.097	0.000	0.26			4.5
S37.003	SW MH60	15 Winter	100	+30%					15.850	-0.098	0.000	0.59			23.5
S38.000	SW MHDP61	60 Winter	100	+30%	30/60 Winter				16.701	0.051	0.000	0.15		33	1.5
S38.001	SW MHD61	60 Winter	100	+30%	30/30 Summer				16.699	0.071	0.000	0.14			1.5
S39.000	SW MHDP61.1	15 Winter	100	+30%					16.623	-0.027	0.000	1.00		5	13.1
S39.001	SW MHD61.1	15 Winter	100	+30%					16.577	-0.030	0.000	1.00			13.1
S37.004	SW MH61	15 Winter	100	+30%					15.673	-0.045	0.000	0.99			35.9
S40.000	SW MHDP62	60 Winter	100	+30%	30/15 Summer				16.677	0.127	0.000	0.13		37	1.9
S40.001	SW MHD62	60 Winter	100	+30%	5/15 Summer				16.674	0.181	0.000	0.12			1.9
S41.000	SW MHDP62.1	60 Winter	100	+30%	30/60 Winter				16.328	0.078	0.000	0.13		47	1.7
S41.001	SW MHD62.1	60 Winter	100	+30%	30/15 Winter				16.325	0.119	0.000	0.13			1.7
S37.005	SW MH62	15 Winter	100	+30%					15.512	-0.081	0.000	0.72			52.5
S42.000	SW MHDP63	120 Winter	100	+30%	5/15 Winter				17.214	0.164	0.000	0.16		74	1.9
S42.001	SW MHD63	120 Winter	100	+30%	5/15 Summer				17.211	0.196	0.000	0.16			1.9
S42.002	SW MH63	15 Winter	100	+30%					16.221	-0.079	0.000	0.45			9.3
S42.003	SW MH64	15 Winter	100	+30%					15.828	-0.072	0.000	0.52			9.2
S43.000	SW MHDP65	120 Winter	100	+30%	5/15 Summer				16.762	0.212	0.000	0.15		82	2.1
S43.001	SW MHD65	120 Winter	100	+30%	5/15 Summer				16.758	0.256	0.000	0.15			2.1
S42.004	SW MH65	15 Winter	100	+30%					15.659	-0.097	0.000	0.59			24.0

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S19.007	SW MH50	SURCHARGED	
S31.000	SW MHDP51.1	SURCHARGED	
S31.001	SW MHD51.1	SURCHARGED	
S32.000	SW MHDP51	SURCHARGED	
S32.001	SW MHD51	SURCHARGED	
S31.002	SW MH51	OK	
S33.000	SW MHDP52	FLOOD RISK	
S33.001	SW MHD52	FLOOD RISK	
S31.003	SW MH52	OK	
S34.000	SW MH53	OK	
S35.000	SW MHDP54	FLOOD RISK	
S35.001	SW MHD54	SURCHARGED	
S31.004	SW MH54	OK	
S31.005	SW MH55	SURCHARGED	
S36.000	SW MH56	OK	
S19.008	SW MH57	SURCHARGED	
S19.009	SW MH58	SURCHARGED	
S37.000	SW MH109	FLOOD RISK	
S37.001	SW MH110	FLOOD RISK	
S37.002	SW MH59	OK	
S37.003	SW MH60	OK	
S38.000	SW MHDP61	SURCHARGED	
S38.001	SW MHD61	SURCHARGED	
S39.000	SW MHDP61.1	OK	
S39.001	SW MHD61.1	OK	
S37.004	SW MH61	OK	
S40.000	SW MHDP62	FLOOD RISK	
S40.001	SW MHD62	FLOOD RISK	
S41.000	SW MHDP62.1	SURCHARGED	
S41.001	SW MHD62.1	SURCHARGED	
S37.005	SW MH62	OK	
S42.000	SW MHDP63	FLOOD RISK	
S42.001	SW MHD63	FLOOD RISK	
S42.002	SW MH63	OK	
S42.003	SW MH64	OK	
S43.000	SW MHDP65	FLOOD RISK	
S43.001	SW MHD65	FLOOD RISK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S42.004	SW MH65	OK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S44.000	SW MHDP66	120 Winter	100	+30%	5/15 Summer				16.480	0.230	0.000	0.15		84	2.1
S44.001	SW MHD66	120 Winter	100	+30%	5/15 Summer				16.476	0.275	0.000	0.15			2.1
S42.005	SW MH66	15 Winter	100	+30%					15.419	-0.081	0.000	0.72			34.9
S45.000	SW MH-Swale4	15 Winter	100	+30%					15.278	-0.072	0.000	0.52		5	8.8
S45.001	SW MH-Swale5	15 Winter	100	+30%	30/15 Summer				15.155	0.049	0.000	0.58			9.1
S46.000	SW MHDP67	15 Winter	100	+30%	100/15 Winter				15.651	0.001	0.000	1.02		5	16.4
S46.001	SW MHD67	15 Winter	100	+30%					15.573	-0.011	0.000	1.00			16.0
S42.006	SW MH67	15 Winter	100	+30%					15.138	-0.062	0.000	0.86			58.6
S47.000	SW MHDP68.1	60 Winter	100	+30%	5/30 Summer				15.526	0.176	0.000	0.12		54	2.1
S47.001	SW MHD68.1	60 Winter	100	+30%	5/15 Summer				15.522	0.258	0.000	0.11			2.1
S48.000	SW MHDP68	60 Winter	100	+30%	5/30 Winter				15.249	0.149	0.000	0.13		53	2.0
S48.001	SW MHD68	60 Winter	100	+30%	5/15 Summer				15.244	0.202	0.000	0.13			1.9
S37.006	SW MH68	15 Winter	100	+30%					14.472	-0.128	0.000	0.62			114.6
S49.000	SW MH-Swale6	15 Winter	100	+30%					14.405	-0.045	0.000	0.81		6	13.7
S49.001	SW MH-Swale7	15 Winter	100	+30%					14.180	-0.035	0.000	0.94			13.8
S37.007	SW MH69	15 Winter	100	+30%					13.513	-0.087	0.000	0.84			128.5
S50.000	SW MH70	15 Summer	5	+30%					12.950	-0.150	0.000	0.00			0.0
S51.000	SW MH-Swale8	15 Winter	100	+30%					13.686	-0.064	0.000	0.63		4	9.7
S51.001	SW MH-Swale9	15 Winter	100	+30%					13.604	-0.061	0.000	0.65			9.6
S52.000	SW MHD71	60 Winter	100	+30%	30/15 Summer				13.685	0.135	0.000	0.15		44	1.9
S52.001	SW MHD71	60 Winter	100	+30%	5/15 Summer				13.682	0.173	0.000	0.15			1.8
S37.008	SW MH71	15 Winter	100	+30%	30/15 Summer				12.830	0.210	0.000	1.86			140.0
S37.009	SW MH72	720 Winter	100	+30%	5/60 Winter				12.815	0.695	0.000	0.04			4.2
S53.000	SW MH-Swale10	15 Winter	100	+30%					16.620	-0.080	0.000	0.43		6	6.6
S53.001	SW MH73.1	15 Winter	100	+30%					16.545	-0.084	0.000	0.39			6.7
S54.000	SW MH-Swale11	15 Winter	100	+30%					16.072	-0.078	0.000	0.46		5	6.3
S53.002	SW MH73	15 Winter	100	+30%					15.219	-0.154	0.000	0.22			12.9
S55.000	SW MH-Swale12	15 Winter	100	+30%					16.068	-0.082	0.000	0.41		6	5.9
S56.000	SW MHDP74	120 Winter	100	+30%	5/15 Summer				16.198	0.198	0.000	0.19		81	2.0
S56.001	SW MHD74	120 Winter	100	+30%	5/15 Summer				16.195	0.219	0.000	0.18			2.0
S53.003	SW MH74	15 Winter	100	+30%					14.923	-0.115	0.000	0.48			19.8
S57.000	SW MH-Swale13	15 Winter	100	+30%					15.970	-0.080	0.000	0.44		6	6.3
S58.000	SW MHDP75	120 Winter	100	+30%	5/30 Summer				16.831	0.151	0.000	0.17		72	1.8
S58.001	SW MHD75	120 Winter	100	+30%	5/15 Summer				16.828	0.169	0.000	0.17			1.8
S53.004	SW MH75	15 Winter	100	+30%					14.777	-0.093	0.000	0.64			27.2
S59.000	SW MHDP76	120 Winter	100	+30%	30/60 Winter				16.103	0.078	0.000	0.07		74	2.0
S59.001	SW MHD76	120 Winter	100	+30%	30/15 Winter				16.109	0.116	0.000	0.06			1.9
S59.002	SW MH76	15 Winter	100	+30%					15.037	-0.163	0.000	0.17			8.0

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S44.000	SW MHDP66	FLOOD RISK	
S44.001	SW MHD66	FLOOD RISK	
S42.005	SW MH66	OK	
S45.000	SW MH-Swale4	OK	
S45.001	SW MH-Swale5	SURCHARGED	
S46.000	SW MHDP67	SURCHARGED	
S46.001	SW MHD67	OK	
S42.006	SW MH67	OK	
S47.000	SW MHDP68.1	FLOOD RISK	
S47.001	SW MHD68.1	FLOOD RISK	
S48.000	SW MHDP68	FLOOD RISK	
S48.001	SW MHD68	SURCHARGED	
S37.006	SW MH68	OK	
S49.000	SW MH-Swale6	FLOOD RISK	
S49.001	SW MH-Swale7	OK	
S37.007	SW MH69	OK	
S50.000	SW MH70	OK	
S51.000	SW MH-Swale8	FLOOD RISK	
S51.001	SW MH-Swale9	OK	
S52.000	SW MHD71	FLOOD RISK	
S52.001	SW MHD71	FLOOD RISK	
S37.008	SW MH71	SURCHARGED	
S37.009	SW MH72	SURCHARGED	
S53.000	SW MH-Swale10	OK	
S53.001	SW MH73.1	OK	
S54.000	SW MH-Swale11	OK	
S53.002	SW MH73	OK	
S55.000	SW MH-Swale12	OK	
S56.000	SW MHDP74	FLOOD RISK	
S56.001	SW MHD74	FLOOD RISK	
S53.003	SW MH74	OK	
S57.000	SW MH-Swale13	OK	
S58.000	SW MHDP75	FLOOD RISK	
S58.001	SW MHD75	FLOOD RISK	
S53.004	SW MH75	OK	
S59.000	SW MHDP76	FLOOD RISK	
S59.001	SW MHD76	FLOOD RISK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S59.002	SW MH76	OK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

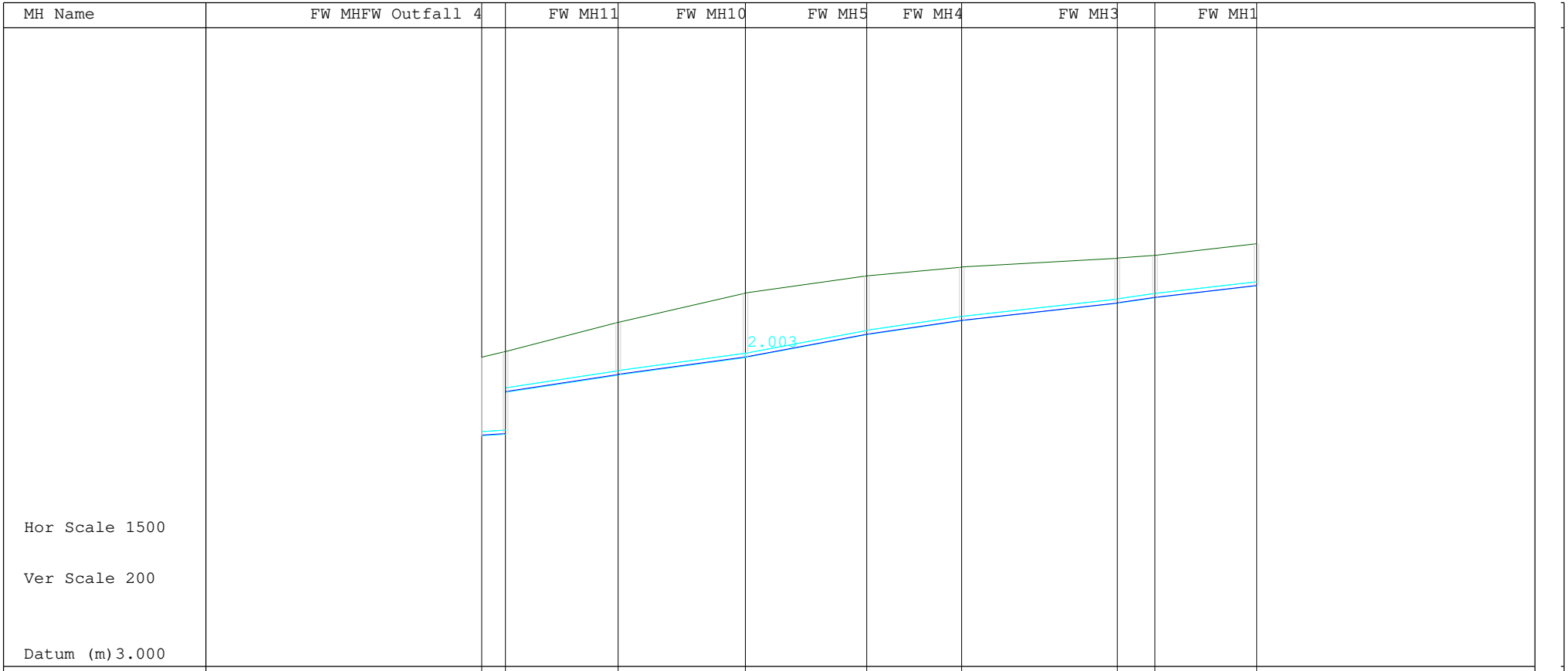
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S60.000	SW MH-Swale13	15 Winter	100	+30%					15.661	-0.089	0.000	0.35		5	5.4
S53.005	SW MH77	15 Winter	100	+30%					14.600	-0.102	0.000	0.57			44.2
S61.000	SW MHDP78	60 Winter	100	+30%	30/30 Summer				15.328	0.078	0.000	0.14		38	1.7
S61.001	SW MHD78	60 Winter	100	+30%	5/30 Winter				15.325	0.114	0.000	0.13			1.6
S53.006	SW MH78	15 Winter	100	+30%					14.177	-0.100	0.000	0.59			45.2
S62.000	SW MH79	15 Winter	100	+30%					14.147	-0.078	0.000	0.46			7.7
S63.000	SW MHDP80	120 Winter	100	+30%	5/30 Winter				14.879	0.129	0.000	0.16		63	1.8
S63.001	SW MHD80	120 Winter	100	+30%	5/15 Winter				14.876	0.152	0.000	0.16			1.8
S53.007	SW MH80	15 Winter	100	+30%					13.783	-0.068	0.000	0.83			56.4
S64.000	SW MHDP81	120 Winter	100	+30%	5/15 Winter				14.602	0.202	0.000	0.20		75	2.0
S64.001	SW MHD81	120 Winter	100	+30%	5/15 Summer				14.599	0.216	0.000	0.18			2.0
S53.008	SW MH81	15 Winter	100	+30%					13.309	-0.165	0.000	0.41			57.8
S65.000	SW MHDP82	60 Winter	100	+30%	5/60 Winter				14.479	0.129	0.000	0.13		50	1.9
S65.001	SW MHD82	60 Winter	100	+30%	5/15 Summer				14.474	0.189	0.000	0.13			1.9
S65.002	SW MH82	60 Winter	100	+30%					13.408	-0.117	0.000	0.11			1.9
S53.009	SW MH83	15 Winter	100	+30%	100/15 Summer				13.141	0.043	0.000	1.25			72.5
S66.000	SW MHDP84	60 Winter	100	+30%	30/15 Winter				14.148	0.098	0.000	0.17		49	1.7
S66.001	SW MHD84	60 Winter	100	+30%	5/30 Winter				14.145	0.112	0.000	0.15			1.6
S53.010	SW MH84	15 Winter	100	+30%					12.994	-0.067	0.000	0.95			72.5
S53.011	SW MH85	15 Winter	100	+30%					11.699	-0.101	0.000	0.77			77.1
S67.000	SW MH86	720 Winter	100	+30%	5/120 Winter				10.867	0.617	0.000	0.00			0.0
S53.012	SW MH86	720 Winter	100	+30%	5/15 Summer				10.867	0.788	0.000	0.03			2.7
S53.013	SW MH88	720 Winter	5	+30%					9.727	-0.333	0.000	0.03			2.7

PN	US/MH Name	Status	Level Exceeded
S60.000	SW MH-Swale13	OK	
S53.005	SW MH77	OK	
S61.000	SW MHDP78	SURCHARGED	
S61.001	SW MHD78	SURCHARGED	
S53.006	SW MH78	OK	
S62.000	SW MH79	OK	
S63.000	SW MHDP80	FLOOD RISK	
S63.001	SW MHD80	FLOOD RISK	
S53.007	SW MH80	OK	

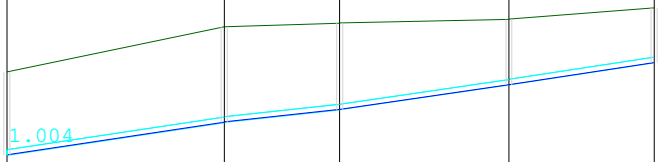
Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S64.000	SW MHDP81	FLOOD RISK	
S64.001	SW MHD81	FLOOD RISK	
S53.008	SW MH81	OK	
S65.000	SW MHDP82	SURCHARGED	
S65.001	SW MHD82	SURCHARGED	
S65.002	SW MH82	OK	
S53.009	SW MH83	SURCHARGED	
S66.000	SW MHDP84	SURCHARGED	
S66.001	SW MHD84	FLOOD RISK	
S53.010	SW MH84	OK	
S53.011	SW MH85	OK	
S67.000	SW MH86	SURCHARGED	
S53.012	SW MH86	SURCHARGED	
S53.013	SW MH88	OK	

Appendix C – Foul Water Longsections



MH Name	FW MHFW Outfall 4		FW MH11	FW MH10	FW MH5	FW MH4	FW MH3		FW MH1	
PN			1.006	1.005	1.004	1.003	1.002		1.000	
Dia (mm)			150	150	150	150	150		150	
Slope (1:X)			49.2	54.6	39.8	50.9	67.4		64.2	
Cover Level (m)	13.600	13.800	14.800	15.800	16.400	16.700	17.000	17.100	17.500	
Invert Level (m)		10.954	12.402	12.991	13.591	14.375	14.855	15.642	16.050	
Length (m)			28.996	32.764	31.203	24.427	40.054		26.181	

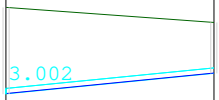
MH Name	FW MH10	FW MH9	FW MH8	FW MH7	FW MH6
					
Hor Scale 1500 Ver Scale 200 Datum (m) 5.000					
PN		2.003	2.002	2.001	2.000
Dia (mm)		150	150	150	150
Slope (1:X)		49.4	68.0	51.0	49.0
Cover Level (m)	15.800	17.000	17.100	17.200	17.500
Invert Level (m)		13.591	14.465 / 14.465	14.803 / 14.803	15.461 / 15.461	16.050
Length (m)		43.183	22.969	33.565	28.864

MH Name	FW MHFW Outfall 3	FW MH35		FW MH28	FW MH23		FW MH21			FW MH17	
PN		3.008		3.006	3.005		3.003			3.000	
Dia (mm)		150		150	150		150			150	
Slope (1:X)		26.4		113.9	143.8		70.2			62.6	
Cover Level (m)	14.400	15.000	15.500	16.000	16.800	17.000	17.200	17.200	17.200	17.200	
Invert Level (m)		12.519 13.568	13.825	13.825 14.082	14.082 14.307	14.532	14.532 14.903	15.144	15.144 15.388	15.388 15.850	
Length (m)		27.714		29.277	32.365		26.050			28.926	

Hor Scale 1500

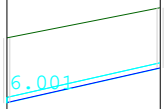
Ver Scale 200

Datum (m) 4.000

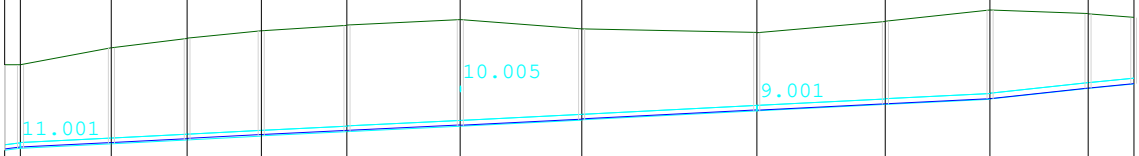
MH Name	FW MH21	FW MH20	
Hor Scale 1500 Ver Scale 200 Datum (m) 5.000			
PN		4.000	
Dia (mm)		150	
Slope (1:X)		75.6	
Cover Level (m)	17.200	16.800	
Invert Level (m)	14.903	15.450	
Length (m)		41.307	

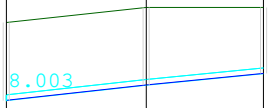
MH Name	FW MH28				FW MH24	
Hor Scale 1500 Ver Scale 200 Datum (m) 4.000						
PN					5.000	
Dia (mm)					150	
Slope (1:X)					92.9	
Cover Level (m)	16.000	16.250	16.300	16.450	16.600	
Invert Level (m)	14.082	14.347	14.347	14.817	14.817	15.012	15.012	15.250	
Length (m)					22.148	

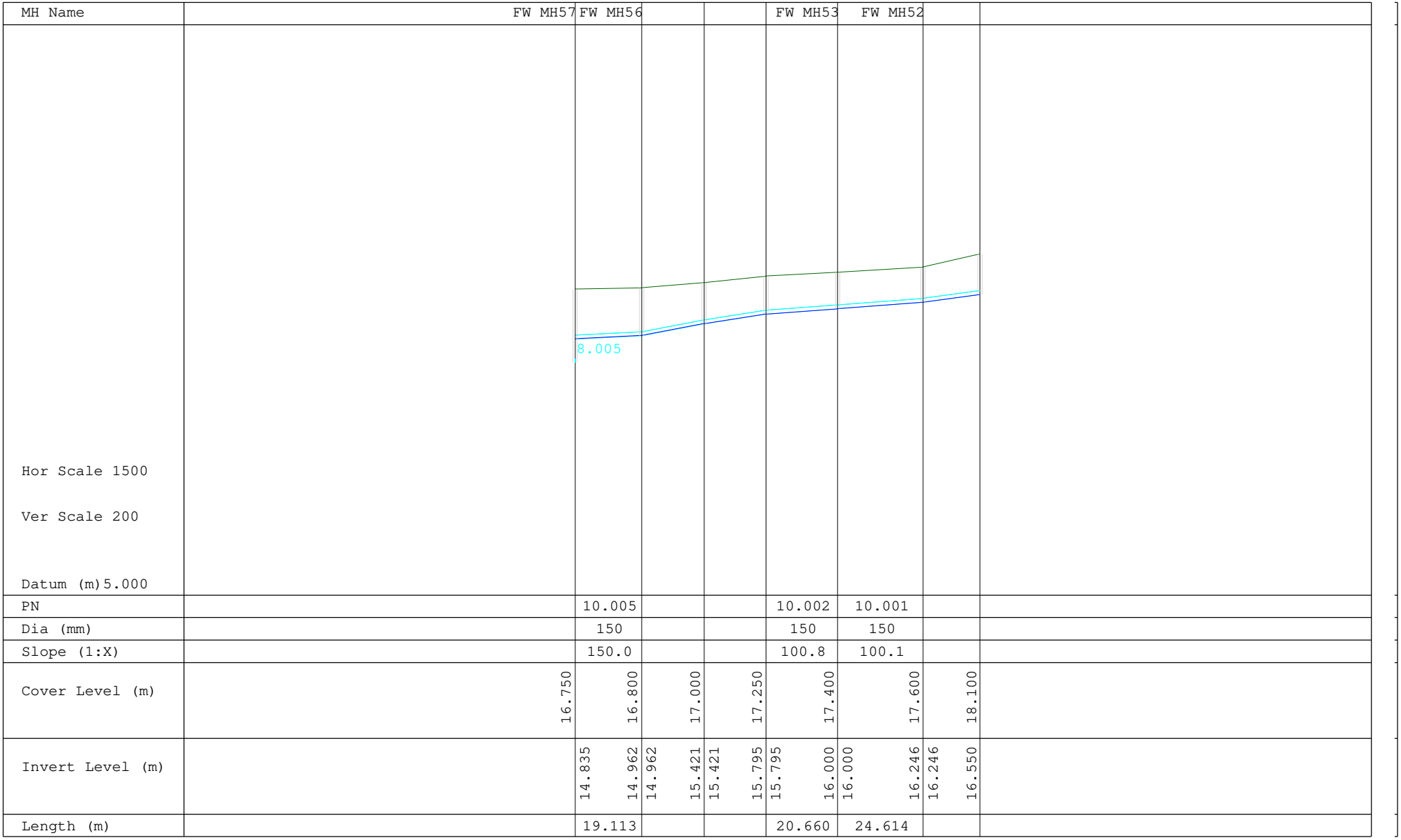
MH Name	FW MH35		FW MH33	FW MH31	FW MH30	
Hor Scale 1500 Ver Scale 200 Datum (m) 4.000		3.007		7.000		
PN			6.002	6.001	6.000	
Dia (mm)			150	150	150	
Slope (1:X)			49.0	62.8	28.4	
Cover Level (m)	15.000	15.500	16.200	16.600	17.000	
Invert Level (m)		13.568 13.943	13.943 14.480	14.480 14.873	14.873 15.650	
Length (m)			26.316	24.665	22.094	

MH Name	FW MH33	FW MH32	
Hor Scale 1500 Ver Scale 200 Datum (m) 5.000			
PN		7.000	
Dia (mm)		150	
Slope (1:X)		33.1	
Cover Level (m)	16.200	17.000	
Invert Level (m)	14.480	15.400	
Length (m)		30.463	

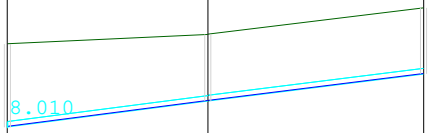
MH Name	FW MHFW Outfall 2						FW MH57	FW MH50	FW MH49	FW MH46	FW MH45	FW MH44		
Hor Scale 1500 Ver Scale 200 Datum (m) 4.000														
PN							8.006	8.005	8.004	8.003	8.002	8.001		
Dia (mm)							150	150	150	150	150	150		
Slope (1:X)							150.3	150.0	146.3	150.0	150.0	68.1		
Cover Level (m)	15.550		16.000	16.250	16.450	16.600	16.750	16.500	16.400	16.700	17.000	16.900	16.800	
Invert Level (m)		13.342	13.462	13.462	13.564	13.564	13.670	13.670	13.783	13.783	13.933	13.933	14.094	14.094	14.332	14.332	14.502	14.502	14.641	14.641	14.927	15.050		
Length (m)							22.544		24.150		34.816		25.495		20.806		19.468			

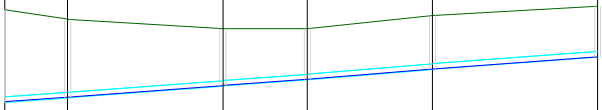


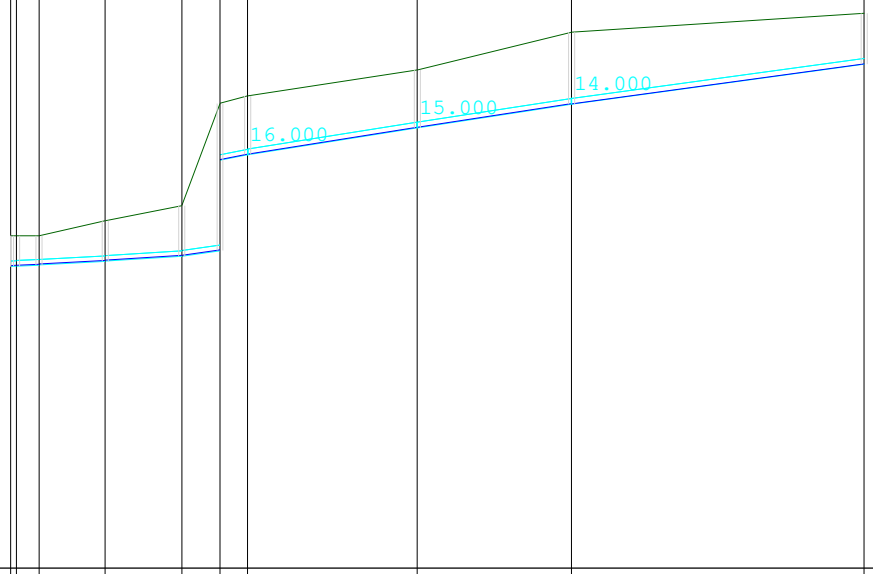
MH Name	FW MH49	FW MH48	FW MH47	
Hor Scale 1500 Ver Scale 200 Datum (m) 5.000				
PN		9.001	9.000	
Dia (mm)		150	150	
Slope (1:X)		68.0	75.4	
Cover Level (m)	16.400	16.800	16.800	
Invert Level (m)	14.332	14.741	14.741 15.050	
Length (m)		27.816	23.290	



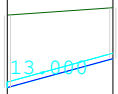
MH Name	FW MH57	FW MH56			FW MH53	FW MH52		
PN		10.005			10.002	10.001		
Dia (mm)		150			150	150		
Slope (1:X)		150.0			100.8	100.1		
Cover Level (m)	16.750	16.800	17.000	17.250	17.400	17.600	18.100	
Invert Level (m)		14.835	14.962	14.962	15.421	15.421	15.795	15.795
		16.000	16.000	16.246	16.246	16.550		
Length (m)		19.113			20.660	24.614		

MH Name	FW MH64	FW MH63	FW MH62	
Hor Scale 1500 Ver Scale 200 Datum (m) 4.000				
PN		11.001	11.000	
Dia (mm)		150	150	
Slope (1:X)		57.5	60.0	
Cover Level (m)	15.550	15.800	16.500	
Invert Level (m)	13.342	14.035 / 14.035	14.750	
Length (m)		39.851	42.926	

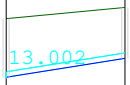
MH Name	FW MHFW Outfall 1		FW MH68		FW MH66	FW MH65	
Hor Scale 1500 Ver Scale 200 Datum (m) 6.000							
PN			12.003		12.001	12.000	
Dia (mm)			150		150	150	
Slope (1:X)			100.0		90.0	100.0	
Cover Level (m)	18.000	17.750	17.500	17.500	17.850	18.100	
Invert Level (m)		15.544 15.669	15.669 15.978	15.978 16.146	16.146 16.422	16.422 16.750	
Length (m)			30.915		24.842	32.803	



MH Name	FW MH						FW MH74	FW MH72	FW MH70
Hor Scale 1500 Ver Scale 200 Datum (m) 2.000									
PN							13.002	13.001	13.000
Dia (mm)							150	150	150
Slope (1:X)							47.2	48.9	54.5
Cover Level (m)	10.800		11.200		11.600	14.300	14.500	15.200	16.200	16.700
Invert Level (m)		10.016	10.115	10.115	10.250	10.400	12.943	12.943	13.656	13.656	14.283	14.283	15.350
Length (m)								33.638	30.677	58.183

MH Name	FW MH72	FW MH71	
Hor Scale 1500 Ver Scale 200 Datum (m) 4.000			
PN		14.000	
Dia (mm)		150	
Slope (1:X)		27.4	
Cover Level (m)	16.200	16.400	
Invert Level (m)		14.283 15.050	
Length (m)		20.982	

MH Name	FW MH74		
		13.001	
Hor Scale 1500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	15.200	15.400	
Invert Level (m)	13.656	14.050	
Length (m)			

MH Name	FW MH76	FW MH75	
			
Hor Scale 1500 Ver Scale 200 Datum (m) 3.000			
PN		16.000	
Dia (mm)		150	
Slope (1:X)		46.6	
Cover Level (m)	14.500	14.800	
Invert Level (m)		12.943 13.450	
Length (m)		23.647	

Appendix D – Surface Water Longsections

Ove Arup & Partners International Ltd		Page 1
The Arup Campus Blyth Gate Solihull B90 8AE	Mungret SW Design	
Date 29/11/2023 15:17 File Swales, Permeable, orifice, Blue, rev att.MDX	Designed by AN Checked by KG	
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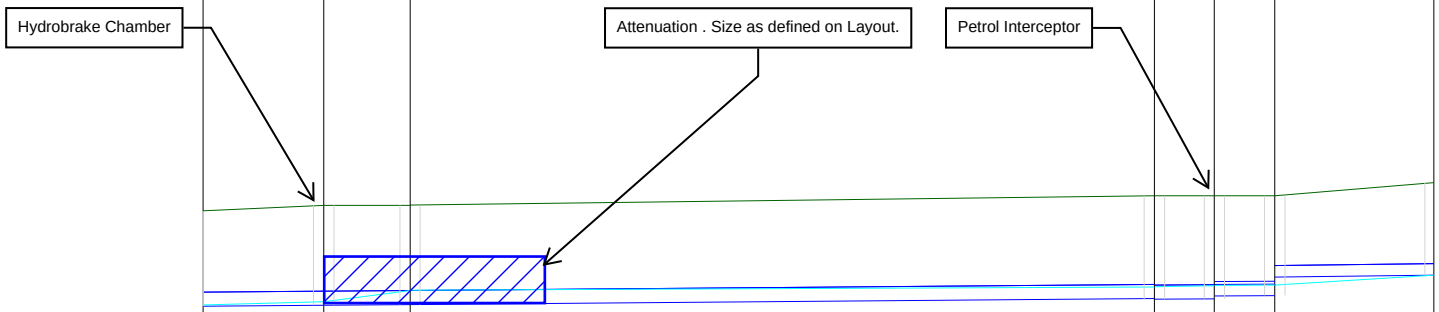

MH Name	SW MH	SW MH17		SW MH13			SW MH1
Hor Scale 500 Ver Scale 200 Datum (m) 5.000							
PN		S1.005		S1.003			S1.000
Dia (mm)		375		375			300
Slope (1:X)		300.0		300.6			200.0
Cover Level (m)	17.600	17.750	17.750	18.000	18.000	18.000	18.350
Invert Level (m)		15.077 15.104	15.104 15.123	15.123 15.287	15.263 15.276	15.351 15.364	15.853 15.906
Length (m)		8.008		49.304			10.554

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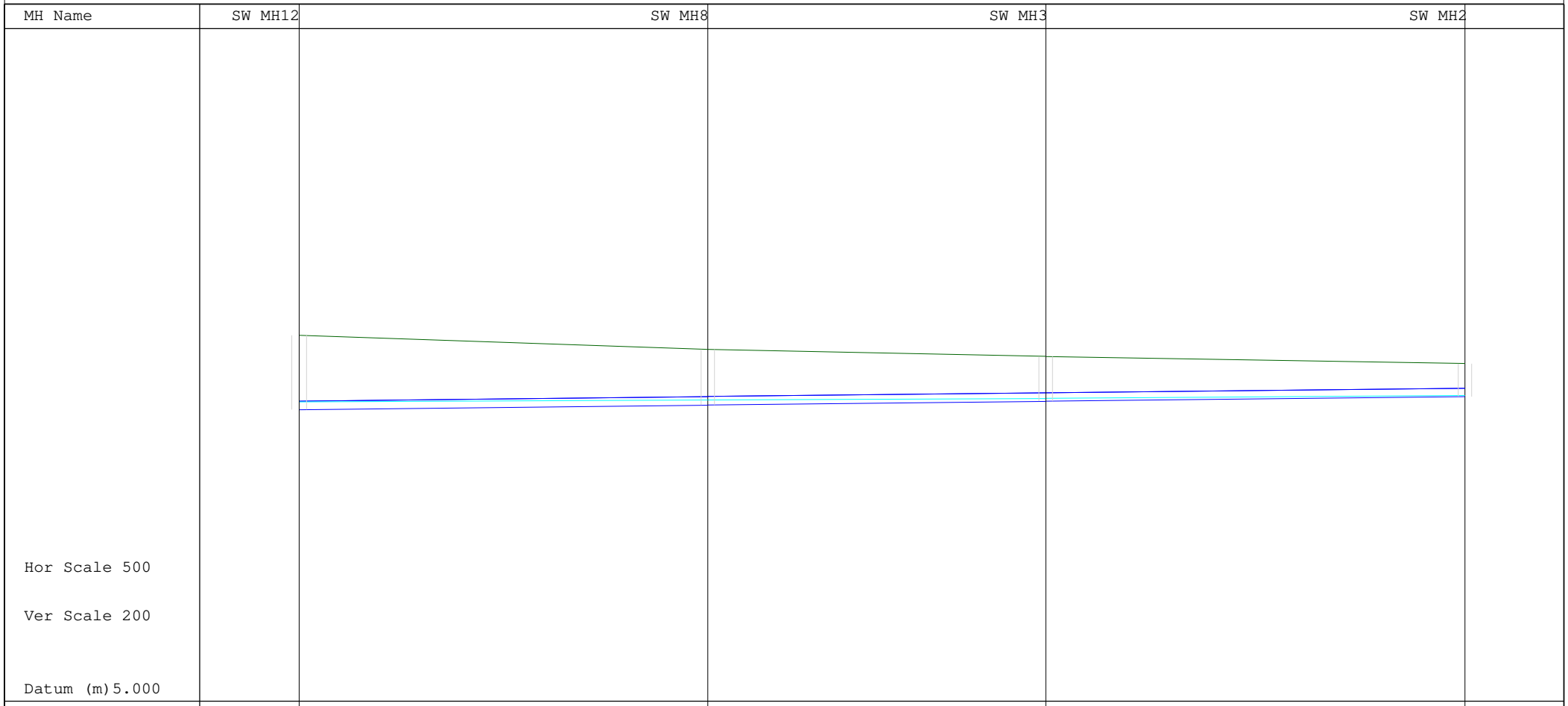

MH Name	SW MH12	SW MH8	SW MH3	SW MH2
PN		S2.002	S2.001	S2.000
Dia (mm)		300	300	300
Slope (1:X)		225.5	224.3	225.0
Cover Level (m)	18.000	17.500	17.250	17.000
Invert Level (m)	15.364	15.525 / 15.525	15.659 / 15.659	15.825
Length (m)		36.310	30.050	37.260

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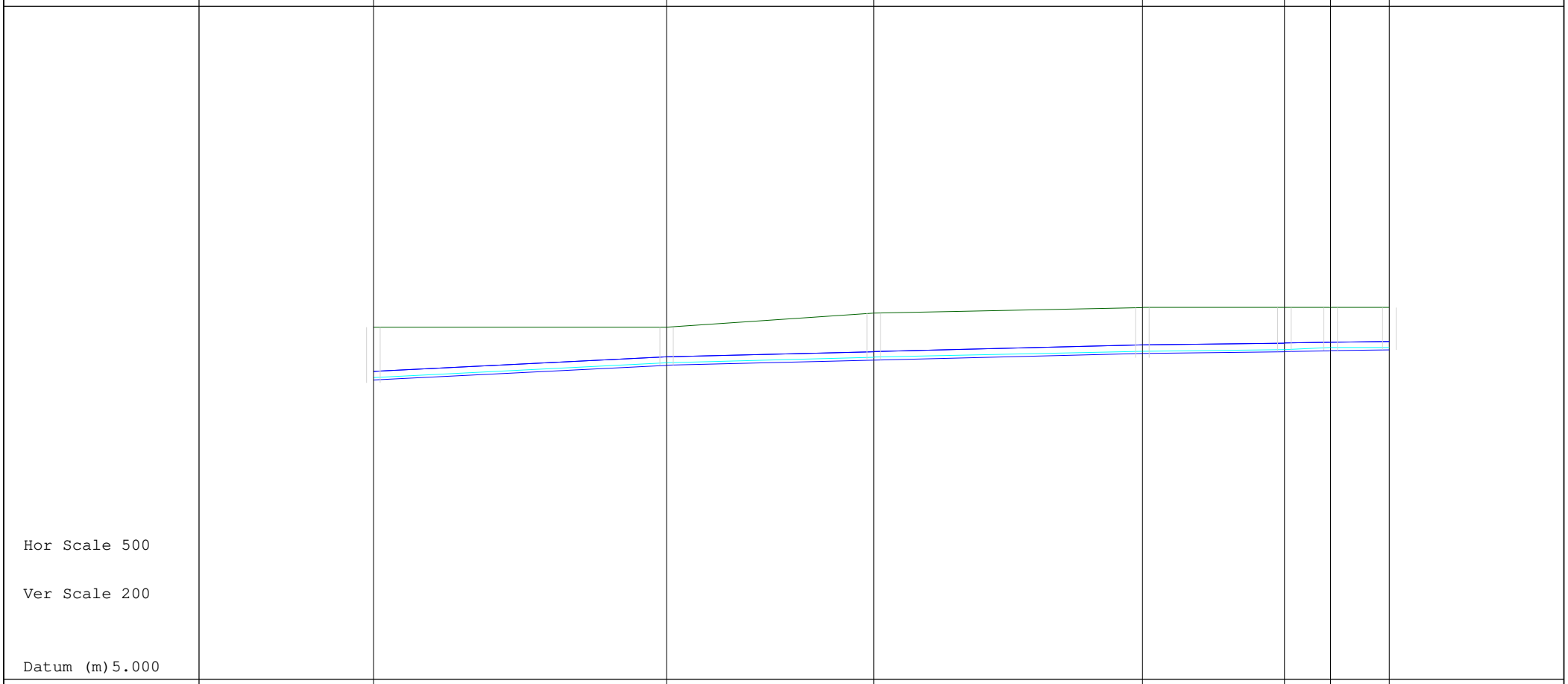

MH Name	SW MH8	SW MH7	SW MH6	SW MH5	SW MH4			
PN		S3.005	S3.004	S3.003	S3.002			
Dia (mm)		300	300	300	300			
Slope (1:X)		50.4	100.0	99.9	200.2			
Cover Level (m)	17.500	17.500	18.000	18.200	18.200	18.200	18.200	
Invert Level (m)	15.634	16.151	16.151	16.335	16.335	16.574	16.573	16.636	16.636	16.668	16.669	16.700
Length (m)		26.038	18.402	23.867	12.615			

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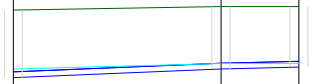
MH Name	SW MH5	SW MHBR5.1		
				
Hor Scale 500 Ver Scale 200 Datum (m) 5.000				
PN		S4.001		
Dia (mm)		150		
Slope (1:X)		59.1		
Cover Level (m)	18.200	18.300	18.300	
Invert Level (m)	16.416	16.648	16.648	16.700
Length (m)		13.750		

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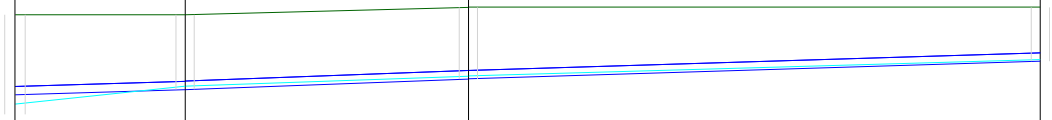
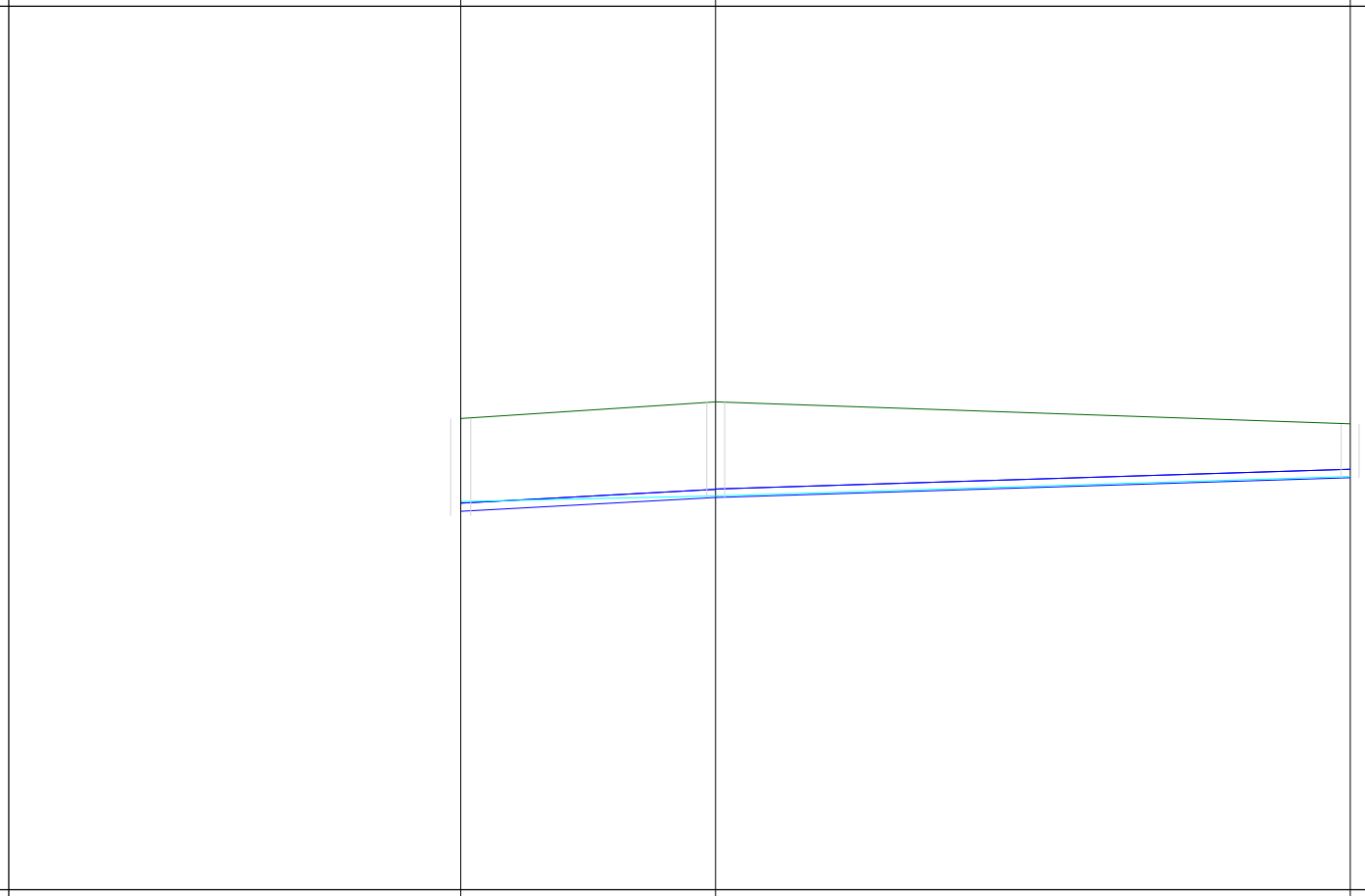


MH Name	SW MH12	SW MH11	SW MH10	SW MH9
Hor Scale 500				
Ver Scale 200				
Datum (m)	5.000			
PN		S5.002	S5.001	S5.000
Dia (mm)		225	225	225
Slope (1:X)		80.0	66.3	80.1
Cover Level (m)	18.000	18.000	18.200	18.200
Invert Level (m)	15.878	16.019	16.302	16.775
		16.019	16.302	
Length (m)		11.270	18.752	37.878

MH Name	SW MH16	SW MH15	SW MH14	
Hor Scale 500 Ver Scale 200 Datum (m) 5.000				
PN		S6.001	S6.000	
Dia (mm)		225	225	
Slope (1:X)		45.8	80.1	
Cover Level (m)	17.750	18.200	17.600	
Invert Level (m)	15.237	15.614	15.614 16.150	
Length (m)		17.257	42.913	

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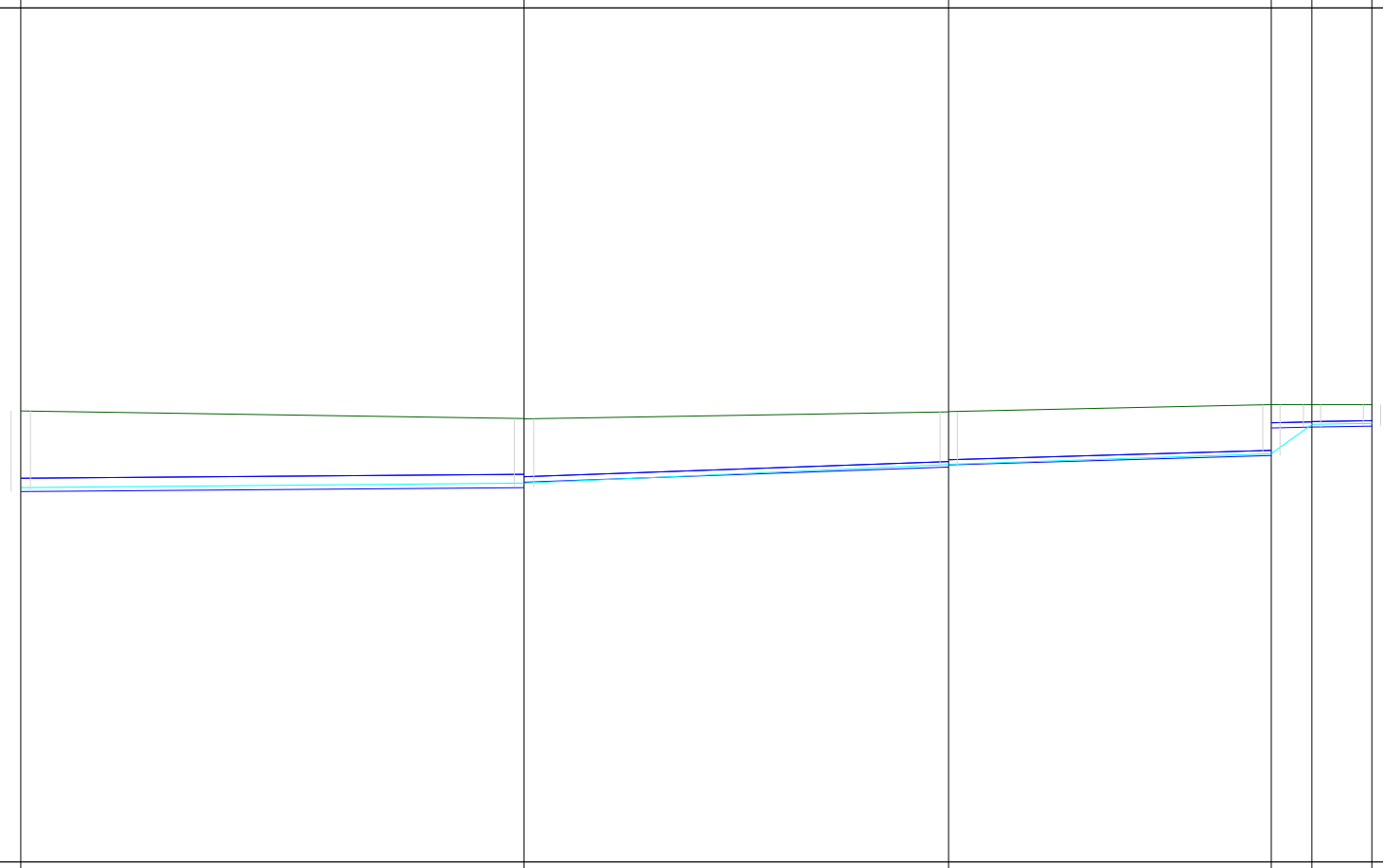

MH Name	SW MH26	SW MH25	SW MH20	SW MH19			
PN		S7.004	S7.003	S7.002			
Dia (mm)		375	150	150			
Slope (1:X)		306.2	69.7	84.6			
Cover Level (m)	16.620	16.400	16.600	16.800	16.800	16.800	
Invert Level (m)	14.367	14.482	14.632	15.058	15.108	15.375	16.172	16.172	16.200
Length (m)		35.213	29.709	22.581			

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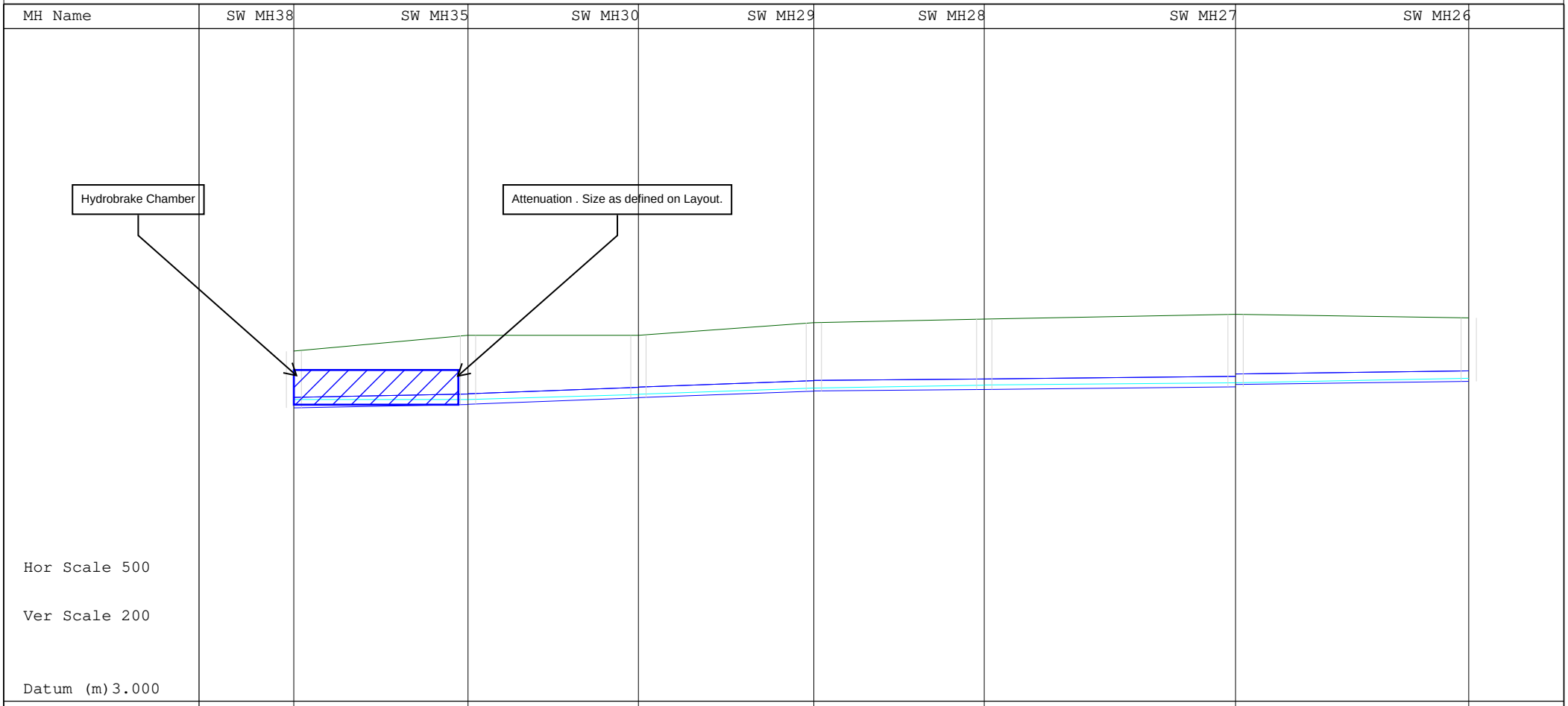
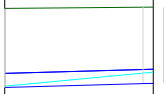


MH Name	SW MH38	SW MH35	SW MH30	SW MH29	SW MH28	SW MH27	SW MH26
PN		S7.010	S7.009	S7.008	S7.007	S7.006	S7.005
Dia (mm)		375	375	375	375	375	375
Slope (1:X)		127.0	66.0	66.0	261.9	230.7	177.2
Cover Level (m)	15.440	16.000	16.000	16.450	16.580	16.750	16.620
Invert Level (m)		13.428	13.550 / 13.555	13.784 / 13.784	14.020 / 14.020	14.078 / 14.078	14.175 / 14.250	14.367
Length (m)		15.468	15.137	15.587	15.138	22.319	20.728

MH Name	SW MH	SW MH38	
			
PN		S7.011	
Dia (mm)		375	
Slope (1:X)		83.5	
Cover Level (m)	15.400	15.440	
Invert Level (m)	13.310	13.428	
Length (m)		9.852	

Hor Scale 500

Ver Scale 200

Datum (m) 2.000

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MH Name	SW MH20		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	16.600	16.600	16.600
Invert Level (m)		15.974	15.974	16.000
Length (m)			

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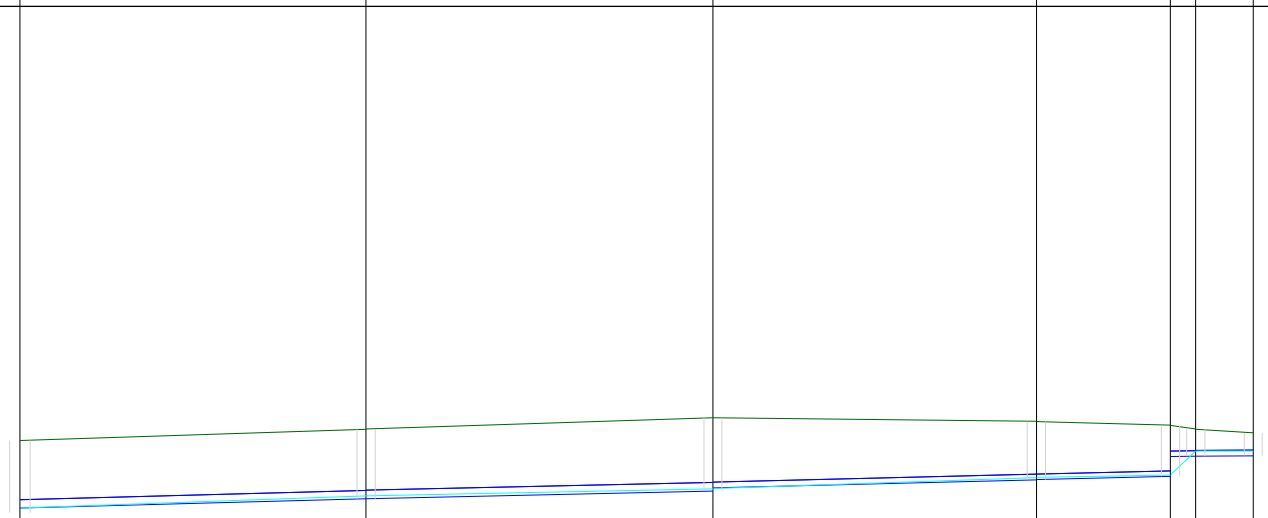

Hor Scale 500

Ver Scale 200

Datum (m) 4.000

MH Name	SW MH25	SW MH24	SW MH23	SW MH22	SW MH21		
PN		S9.005	S9.004	S9.003	S9.002		
Dia (mm)		225	225	150	150		
Slope (1:X)		91.3	109.4	98.3	99.5		
Cover Level (m)	16.400	16.700	17.000	16.900	16.800	16.600	
Invert Level (m)	14.607	14.858	14.858	15.068	15.143	15.361	15.361	15.450	15.983	16.000
Length (m)		22.926	22.980	21.435	8.857		

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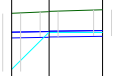
MH Name	SW MH22		
			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	16.900	16.950	17.000
Invert Level (m)		16.275	16.300
Length (m)			

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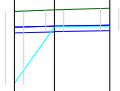
MH Name	SW MH23		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.000	17.050	17.100
Invert Level (m)	16.473	16.473	16.500
Length (m)			

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MH Name	SW MH24			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	16.700	16.700	16.700	
Invert Level (m)		16.021 16.061	16.061 16.100	
Length (m)				

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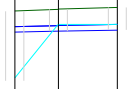
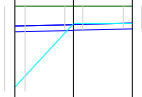
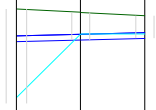
MH Name	SW MH24		
			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	16.700	16.750	16.800
Invert Level (m)	16.171	16.171	16.200
Length (m)			

MH Name	SW MH26			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	16.620	16.620	16.620	
Invert Level (m)	15.942	15.981	15.981	16.020
Length (m)				

MH Name	SW MH28			
Hor Scale 500 Ver Scale 200 Datum (m) 3.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	16.580	16.490	16.400	
Invert Level (m)	15.713	15.756	15.756	15.800
Length (m)				

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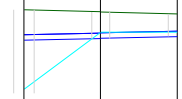
MH Name	SW MH30			
Hor Scale 500 Ver Scale 200 Datum (m)3.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	16.000	15.945	15.890	
Invert Level (m)	15.188	15.239	15.239	15.290
Length (m)				

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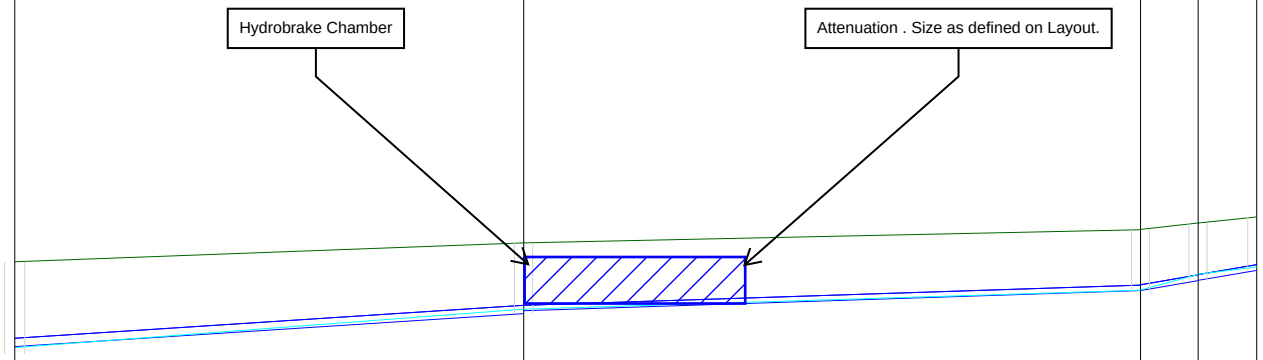

MH Name	SW MH35	SW MH34	SW MH31			
Hor Scale 500 Ver Scale 200 Datum (m) 3.000						
PN		S17.003	S17.002			
Dia (mm)		225	150			
Slope (1:X)		38.4	76.3			
Cover Level (m)	16.000	16.500	16.850	17.025	17.200	
Invert Level (m)	13.750	14.629	14.704	15.240	15.240	15.507	15.507	15.775
Length (m)		33.719	40.862			

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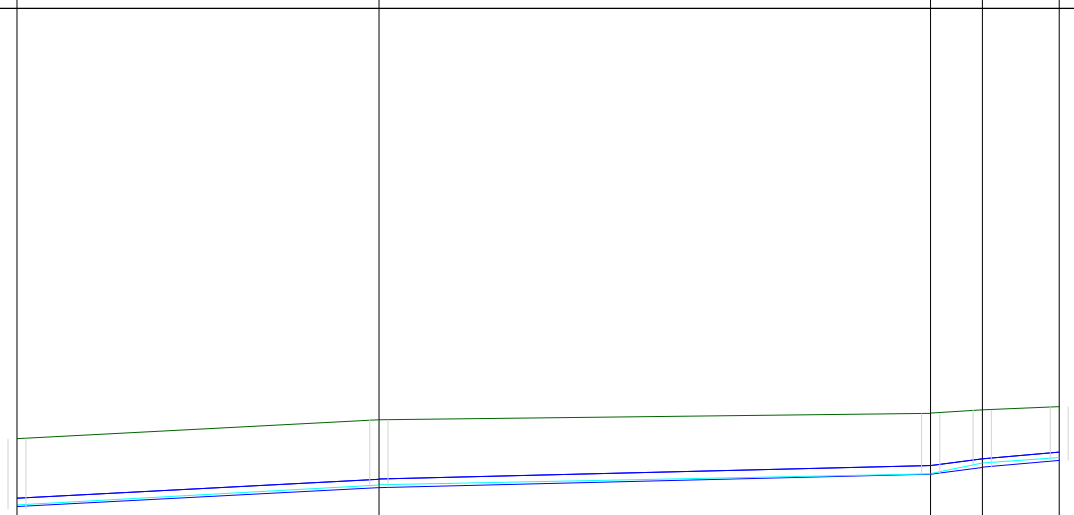

Hor Scale 500
Ver Scale 200
Datum (m) 4.000

MH Name	SW MH34	SW MH33	SW MH32			
PN		S18.003	S18.002			
Dia (mm)		225	225			
Slope (1:X)		47.8	101.7			
Cover Level (m)	16.500	17.000	17.175	17.263	17.350	
Invert Level (m)	14.704	15.206	15.206	15.566	15.745	15.745	15.925
Length (m)		23.973	36.548			

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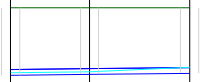
MH Name	SW MH33	SW MHBR33
Hor Scale 500 Ver Scale 200 Datum (m) 4.000		
PN		S19.000
Dia (mm)		150
Slope (1:X)		244.9
Cover Level (m)	17.000	17.000
Invert Level (m)	15.216 15.243	15.243 15.270
Length (m)		6.631

MH Name	SW MH34		SW MHBR34	
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN			S20.000	
Dia (mm)			150	
Slope (1:X)			221.2	
Cover Level (m)	16.500	16.500	16.500	
Invert Level (m)		14.638	14.669	14.700
Length (m)			6.806	

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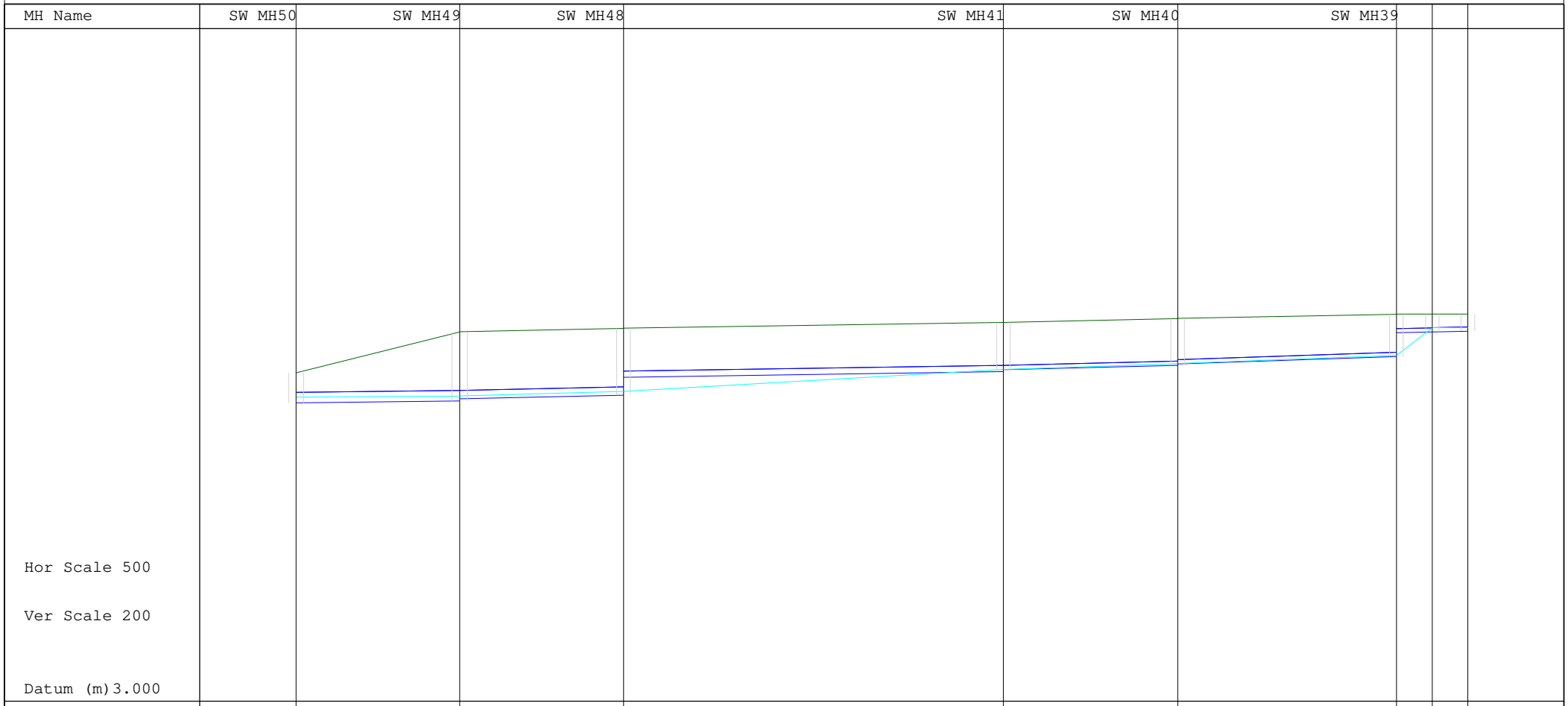
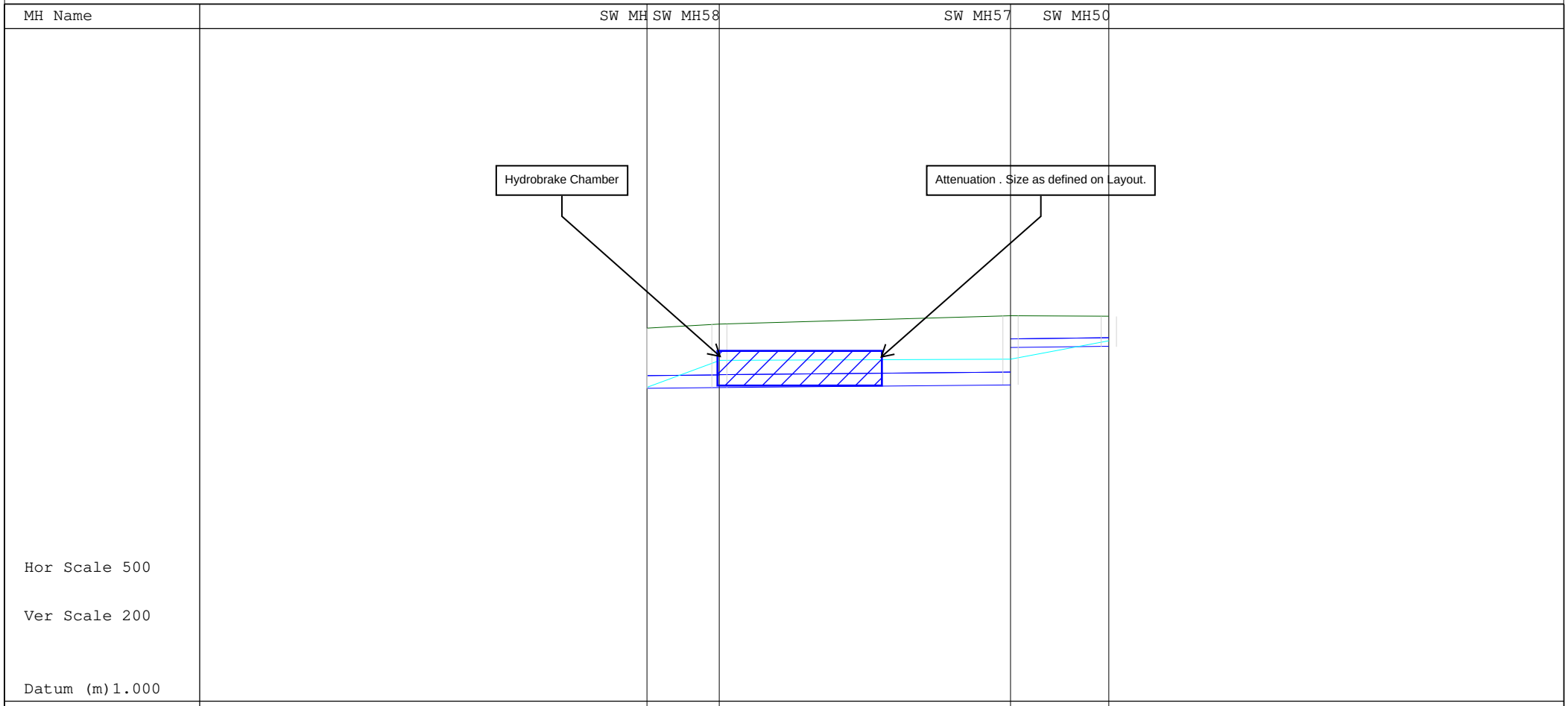


MH Name	SW MH50	SW MH49	SW MH48	SW MH41	SW MH40	SW MH39			
PN		S21.006	S21.005	S21.004	S21.003	S21.002			
Dia (mm)		375	300	225	150	150			
Slope (1:X)		199.9	112.7	161.5	100.0	73.9			
Cover Level (m)	14.675	16.125	16.250	16.460	16.600	16.750	16.750	16.750	
Invert Level (m)		13.600	13.672	13.747	13.877	14.507	14.716	14.782	14.937	14.987	15.250	16.118	16.150	
Length (m)		14.541	14.550	33.752	15.504	19.434			



MH Name	SW MH	SW MH58	SW MH57	SW MH50	
Hor Scale 500 Ver Scale 200 Datum (m)1.000					
PN		S21.009	S21.008	S21.007	
Dia (mm)		450	450	300	
Slope (1:X)		200.0	258.7	199.9	
Cover Level (m)	14.250	14.400	14.700	14.675	
Invert Level (m)	12.113	12.145	12.145 12.245	13.574 13.618	
Length (m)		6.427	25.871	8.752	

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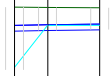
MH Name	SW MH40		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	16.600	16.590	16.580
Invert Level (m)		15.978	16.000
Length (m)			

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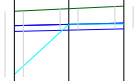
MH Name	SW MH41			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	16.460	16.530	16.600	
Invert Level (m)	15.927	15.964	15.964	16.000
Length (m)				

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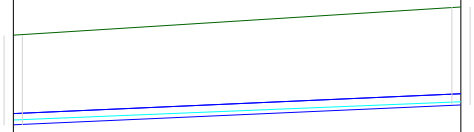
MH Name	SW MH47	SW MH46	SW MH45	SW MH43	SW MH42			
PN		S24.005	S24.004	S24.003	S24.002			
Dia (mm)		300	300	225	150			
Slope (1:X)		198.2	200.0	246.4	100.0			
Cover Level (m)	17.000	17.000	17.200	17.200	17.200	17.200	17.200	
Invert Level (m)		14.409	14.455	14.394	14.538	15.164	15.256	15.503	15.850	16.565	16.600	
Length (m)		9.023	28.784	22.797	34.729			

Hor Scale 500

Ver Scale 200

Datum (m) 4.000

MH Name	SW MH48	SW MH47	
			
PN		S24.006	
Dia (mm)		300	
Slope (1:X)		55.8	
Cover Level (m)	16.250	17.000	
Invert Level (m)	13.877	14.409	
Length (m)		29.663	

Hor Scale 500

Ver Scale 200

Datum (m) 3.000

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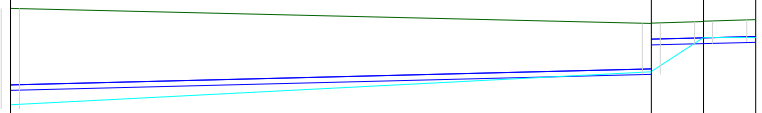
MH Name	SW MH45	SW MH44			
					
Hor Scale 500 Ver Scale 200 Datum (m) 4.000					
PN		S25.002			
Dia (mm)		150			
Slope (1:X)		100.0			
Cover Level (m)	17.200	16.800	16.850	16.900	
Invert Level (m)	15.026	15.450	16.265	16.300	
Length (m)		42.441			

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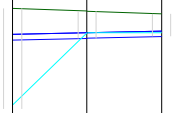
MH Name	SW MH45			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	17.200	17.125	17.050	
Invert Level (m)	16.351	16.401	16.401	16.450
Length (m)				

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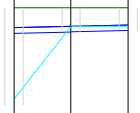
MH Name	SW MH46			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	17.000	17.000	17.000	
Invert Level (m)	16.324	16.362	16.362	16.400
Length (m)				

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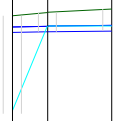
MH Name	SW MH47		
			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.000	17.090	17.180
Invert Level (m)		16.577	16.577	16.600
Length (m)			

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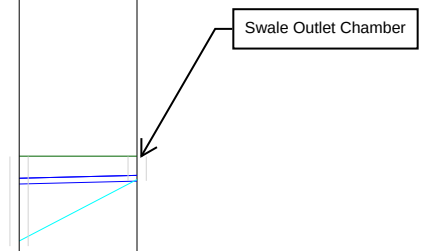
MH Name	SW MH8	SW8MH-Swale1	
Hor Scale 500 Ver Scale 200 Datum (m) 3.000			
PN		S29.000	
Dia (mm)		150	
Slope (1:X)		100.0	
Cover Level (m)	16.250	16.250	
Invert Level (m)	15.522	15.600	
Length (m)		7.826	

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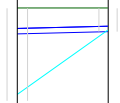
MH Name	SW MH49	
Hor Scale 500 Ver Scale 200 Datum (m) 3.000		
PN		
Dia (mm)		
Slope (1:X)		
Cover Level (m)	16.125	16.125
Invert Level (m)	15.440	15.500
Length (m)		

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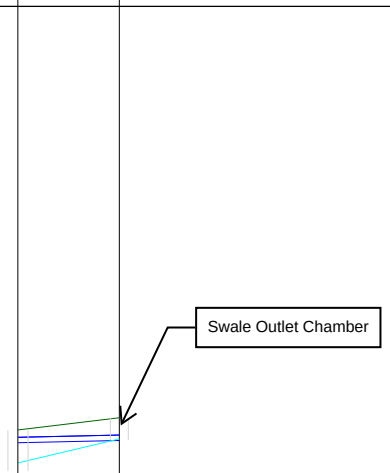
MH Name	SW MH50	MH-Swale3
Hor Scale 500 Ver Scale 200 Datum (m) 2.000		
PN		S31.000
Dia (mm)		150
Slope (1:X)		99.9
Cover Level (m)	14.675	15.000
Invert Level (m)	14.333	14.400
Length (m)		6.724

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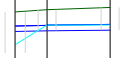
MH Name	SW MH50		
Hor Scale 500 Ver Scale 200 Datum (m)2.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	14.675	14.738	14.800
Invert Level (m)	14.179	14.179	14.200
Length (m)			

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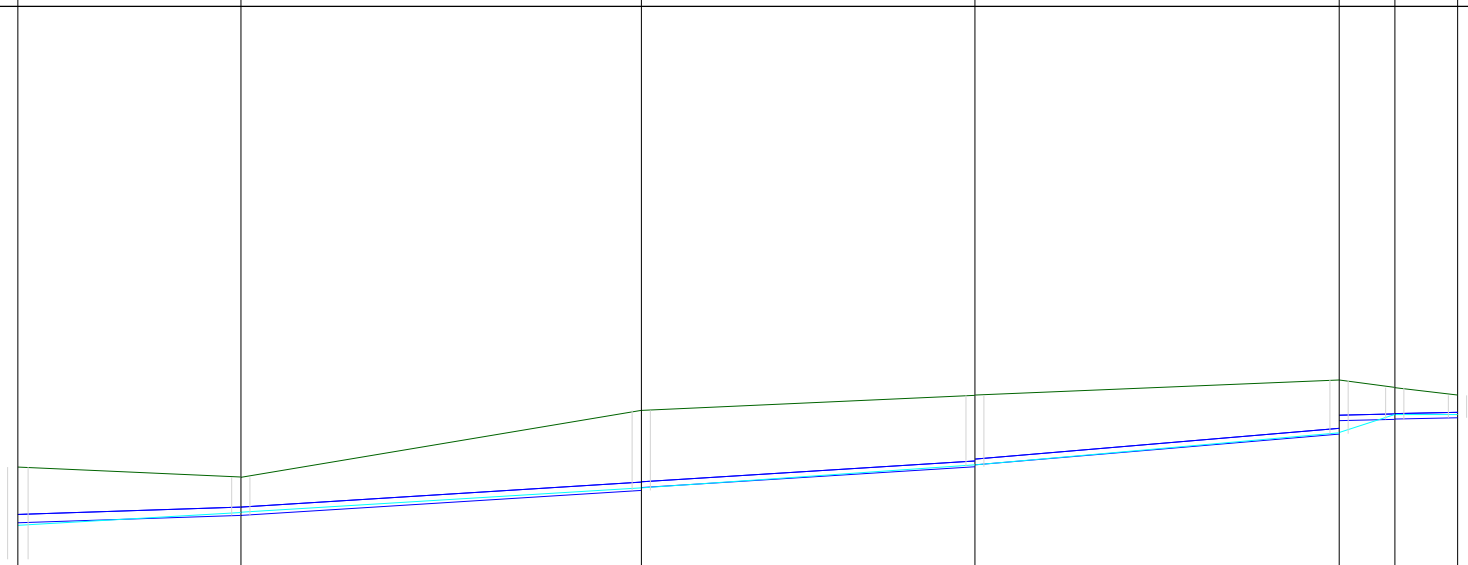

MH Name	SW MH57	SW MH55	SW MH54	SW MH52	SW MH51			
Hor Scale 500 Ver Scale 200 Datum (m) 3.000								
PN		S33.005	S33.004	S33.003	S33.002			
Dia (mm)		225	225	150	150			
Slope (1:X)		74.6	40.1	39.8	29.6			
Cover Level (m)	14.700	14.430	16.200	16.600	17.000	16.800	16.600	
Invert Level (m)		13.221	13.419	13.419	14.080	14.155	14.711	14.761	15.575	15.917	15.958	15.958	16.000
Length (m)		14.769	26.522	22.110	24.123			

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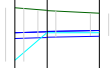
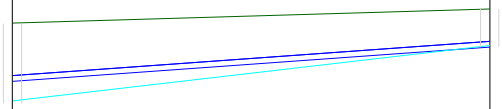
MH Name	SW MH51		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.000	16.925	16.850
Invert Level (m)		16.220	16.250
Length (m)			

MH Name	SW MH52		
			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	16.600	16.700	16.800
Invert Level (m)		16.159	16.200
Length (m)			

MH Name	SW MH54	SW MH53	
			
Hor Scale 500 Ver Scale 200 Datum (m) 3.000			
PN		S36.000	
Dia (mm)		150	
Slope (1:X)		34.9	
Cover Level (m)	16.200	16.575	
Invert Level (m)	14.668	15.575	
Length (m)		31.629	

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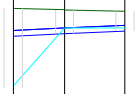
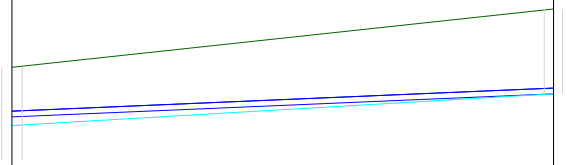
MH Name	SW MH54		
Hor Scale 500 Ver Scale 200 Datum (m) 3.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	16.200	16.160	16.120
Invert Level (m)		15.532	15.532	15.600
Length (m)			

MH Name	SW MH57	SW MH56	
			
Hor Scale 500 Ver Scale 200 Datum (m)2.000			
PN		S38.000	
Dia (mm)		150	
Slope (1:X)		58.6	
Cover Level (m)	14.700	16.250	
Invert Level (m)	13.388	14.000	
Length (m)		35.874	

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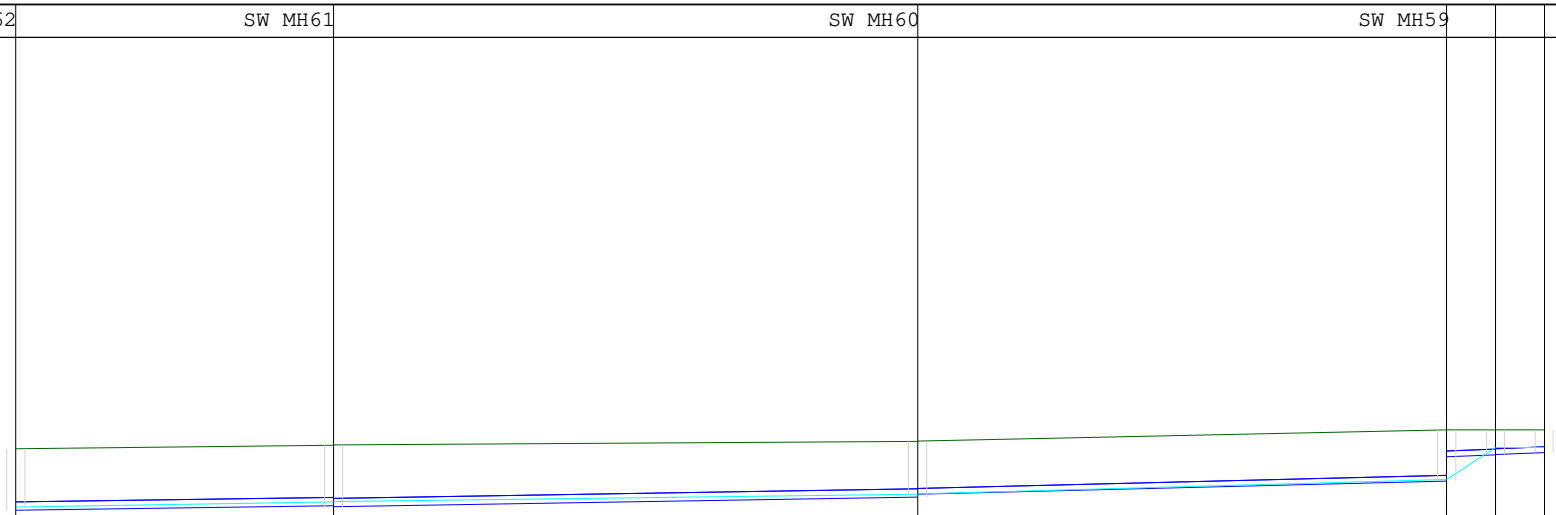
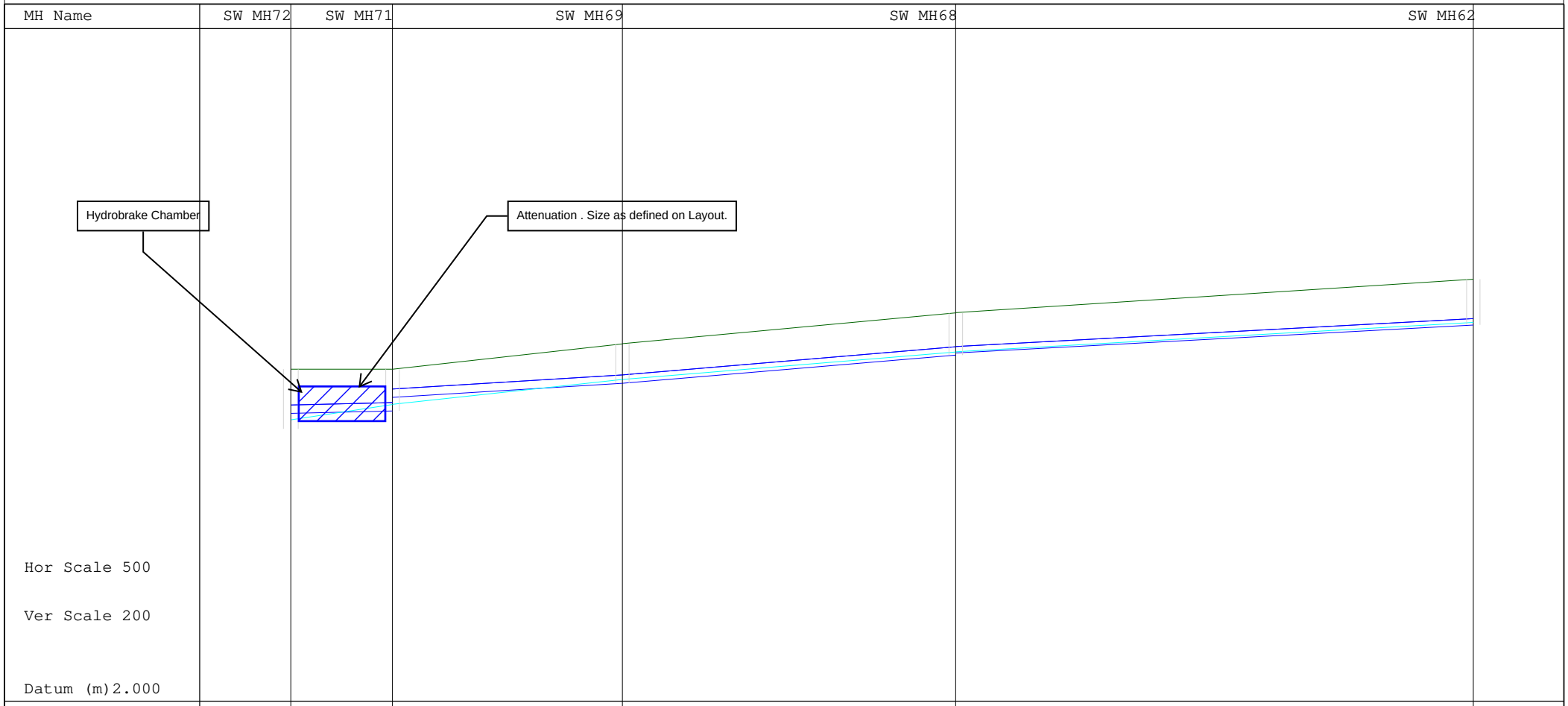


Hor Scale 500

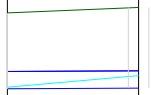
Ver Scale 200

Datum (m) 4.000

MH Name	SW MH62	SW MH61	SW MH60	SW MH59			
PN		S39.004	S39.003	S39.002			
Dia (mm)		225	225	150			
Slope (1:X)		168.2	150.0	99.6			
Cover Level (m)	17.000	17.100	17.200	17.500	17.500	17.500	
Invert Level (m)		15.368	15.493	15.465	15.723	15.798	16.150	16.845	16.900	
Length (m)		21.036	38.685	35.044			



MH Name	SW MH72	SW MH71	SW MH69	SW MH68	SW MH62
PN		S39.008	S39.007	S39.006	S39.005
Dia (mm)		300	300	300	225
Slope (1:X)		100.0	40.9	29.6	46.4
Cover Level (m)	13.800	13.800	14.700	15.800	17.000
Invert Level (m)		12.230 12.320	12.800 13.300	13.300 14.300	14.375 15.368
Length (m)		9.034	20.441	29.623	46.009

MH Name	SW MH	SW MH72	
Hor Scale 500 Ver Scale 200 Datum (m)1.000			
PN		S39.009	
Dia (mm)		450	
Slope (1:X)		400.0	
Cover Level (m)	13.650	13.800	
Invert Level (m)	11.648	11.670	
Length (m)		8.688	

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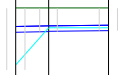
MH Name	SW MH61		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.100	17.100	17.100
Invert Level (m)	16.478	16.478	16.500
Length (m)			

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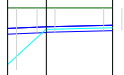
MH Name	SW MH61		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.100	17.100	17.100
Invert Level (m)		16.456	16.456 16.500
Length (m)			

MH Name	SW MH62		
			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.000	17.000	17.000
Invert Level (m)		16.343	16.400
Length (m)			

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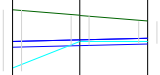
MH Name	SW MH62			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	17.000	16.850	16.700	
Invert Level (m)	16.010	16.055	16.055	16.100
Length (m)				

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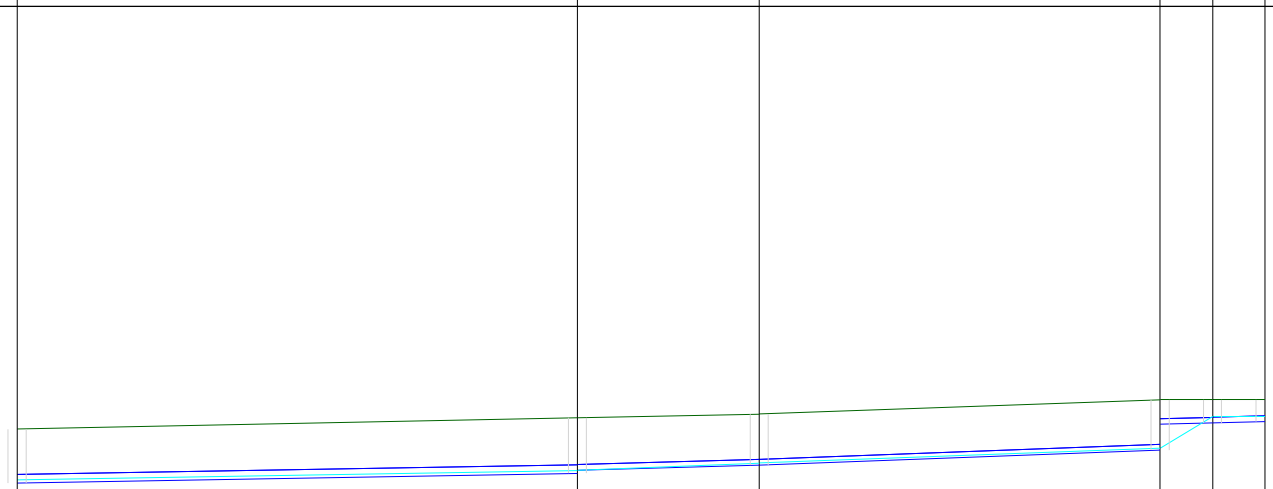
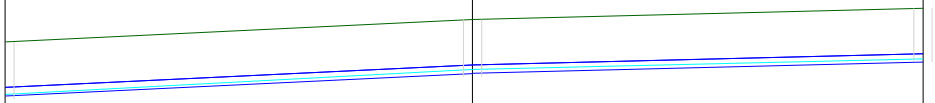
MH Name	SW MH66	SW MH65	SW MH64	SW MH63			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000							
PN		S44.004	S44.003	S44.002			
Dia (mm)		225	150	150			
Slope (1:X)		144.8	83.7	66.4			
Cover Level (m)	16.700	17.000	17.100	17.480	17.480	17.480	
Invert Level (m)	15.275	15.531	15.606	15.750	15.750	16.150	16.865	16.900
Length (m)		37.111	12.040	26.553			

MH Name	SW MH68	SW MH67	SW MH66	
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN		S44.006	S44.005	
Dia (mm)		225	225	
Slope (1:X)		51.6	99.4	
Cover Level (m)	15.800	16.400	16.700	
Invert Level (m)	14.375	14.975	14.975 / 15.275	
Length (m)		30.971	29.834	

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MH Name	SW MH65		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.000	17.000	17.000
Invert Level (m)		16.352	16.352	16.400
Length (m)			

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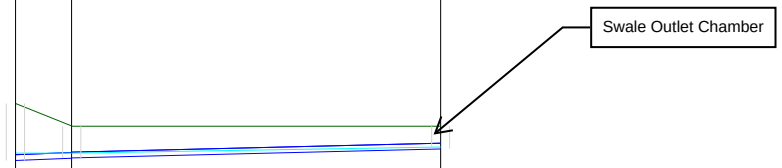
MH Name	SW MH66		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	16.700	16.700	16.700
Invert Level (m)		16.051	16.051	16.100
Length (m)			

MH Name	SW MH67		SW MH-Swale4	
PN			S47.000	
Dia (mm)			150	
Slope (1:X)			100.0	
Cover Level (m)	16.400	15.800	15.800	
Invert Level (m)		14.892 14.956	14.956	15.200
Length (m)			24.441	

Hor Scale 500

Ver Scale 200

Datum (m) 4.000



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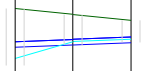
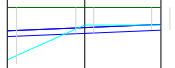
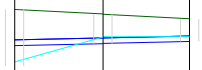
MH Name	SW MH67			
				
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	16.400	16.245	16.090	
Invert Level (m)	15.369	15.435	15.435	15.500
Length (m)				

MH Name	SW MH68			
Hor Scale 500 Ver Scale 200 Datum (m)3.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	15.800	15.800	15.800	
Invert Level (m)	15.028	15.114	15.114	15.200
Length (m)				

MH Name	SW MH68			
				
Hor Scale 500 Ver Scale 200 Datum (m) 3.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	15.800	15.675	15.550	
Invert Level (m)	14.835	14.892	14.892	14.950
Length (m)				

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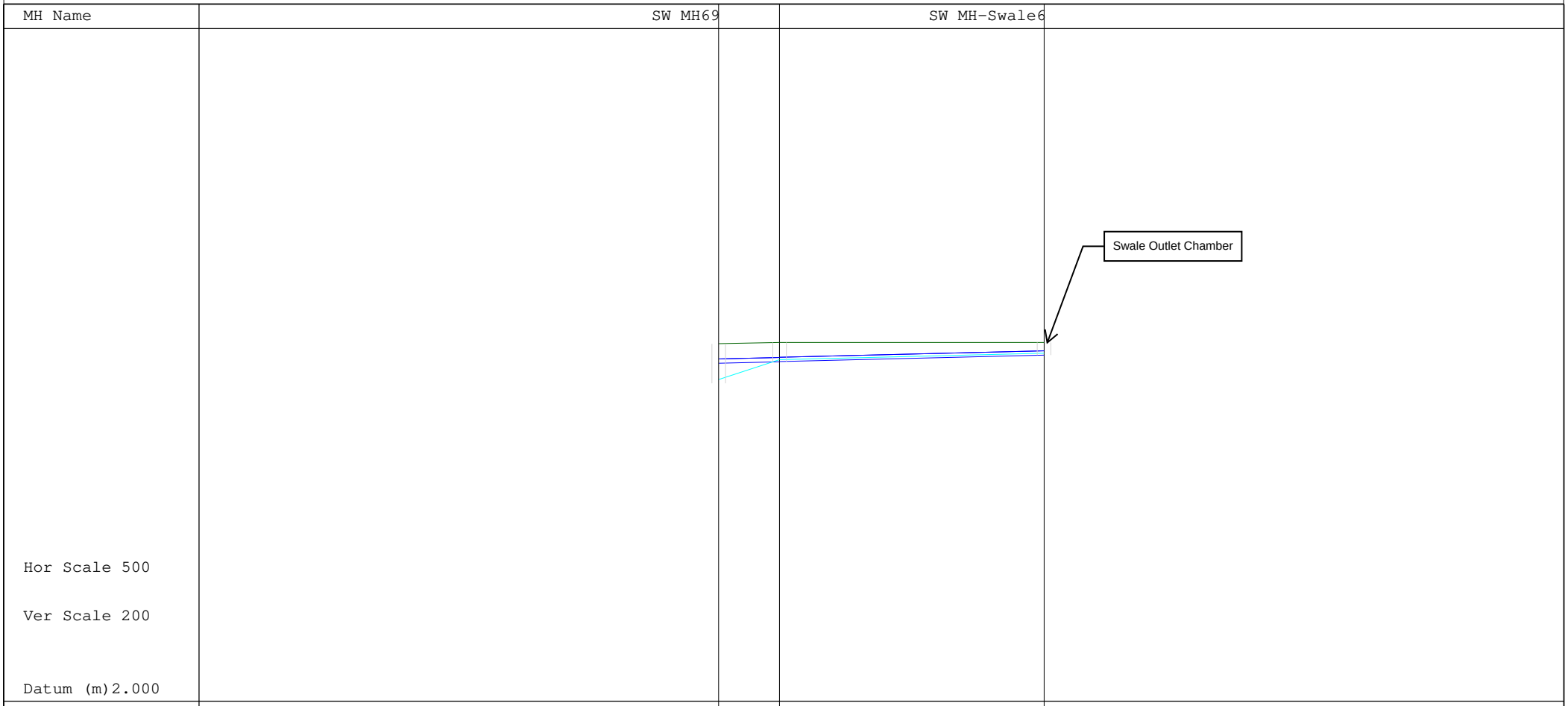

MH Name	SW MH69		SW MH-Swale6	
PN			S51.000	
Dia (mm)			150	
Slope (1:X)			100.0	
Cover Level (m)	14.700	14.750	14.750	
Invert Level (m)		14.011 / 14.065	14.065 / 14.300	
Length (m)			23.505	

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MH Name	SW MH71	SW MH70	
Hor Scale 500 Ver Scale 200 Datum (m)1.000			
PN		S52.000	
Dia (mm)		150	
Slope (1:X)		58.5	
Cover Level (m)	13.800	14.300	
Invert Level (m)	12.520	12.950	
Length (m)		25.143	

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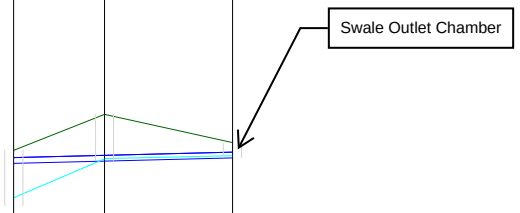
MH Name	SW MH71	SW	MH-Swale8
Hor Scale 500 Ver Scale 200 Datum (m)2.000			
PN			S53.000
Dia (mm)			150
Slope (1:X)			100.0
Cover Level (m)	13.800	14.750	14.000
Invert Level (m)	13.455	13.515	13.515 / 13.600
Length (m)			8.483



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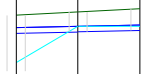
MH Name	SW MH71			
Hor Scale 500 Ver Scale 200 Datum (m)1.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	13.800	13.890	13.980	
Invert Level (m)	13.318	13.359	13.359	13.400
Length (m)				

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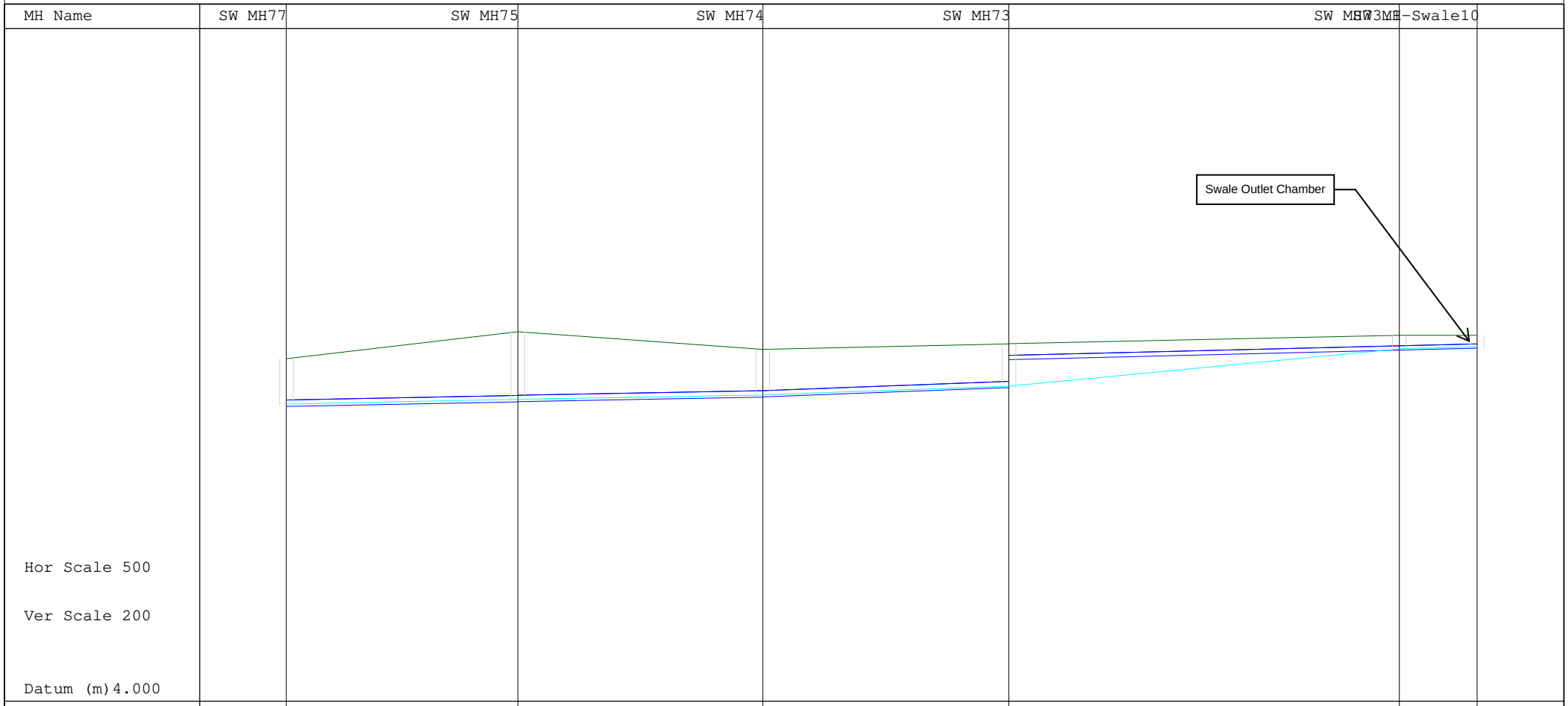

MH Name	SW MH77	SW MH75	SW MH74	SW MH73	SW MH3ME-Swale10
PN		S55.004	S55.003	S55.002	S55.001	S55.000
Dia (mm)		225	225	225	150	150
Slope (1:X)		122.7	129.8	65.1	101.3	97.4
Cover Level (m)	16.170	17.130	16.500	16.700	17.000	17.000
Invert Level (m)		14.477	14.645	14.645	14.813	14.813	15.148	16.136	16.479	16.479	16.550
Length (m)		20.585	21.780	21.856	34.703	6.918

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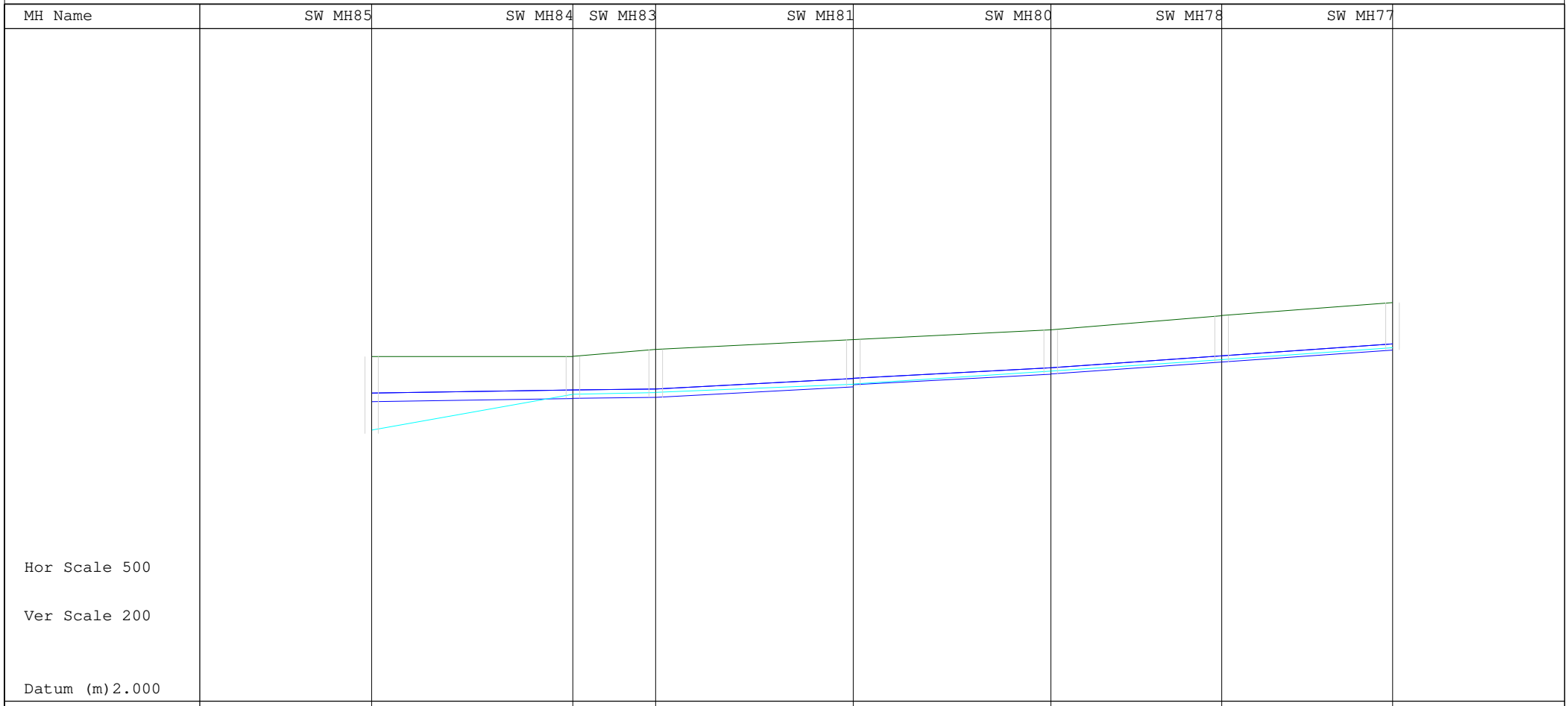
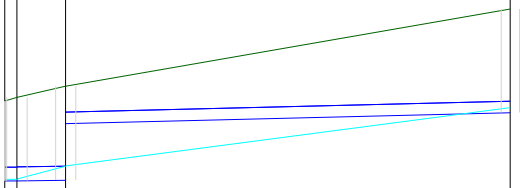


MH Name	SW MH85	SW MH84	SW MH83	SW MH81	SW MH80	SW MH78	SW MH77
PN		S55.010	S55.009	S55.008	S55.007	S55.006	S55.005
Dia (mm)		300	300	300	225	225	225
Slope (1:X)		155.6	197.1	46.6	46.6	35.7	35.7
Cover Level (m)	14.250	14.250	14.500	14.850	15.200	15.700	16.170
Invert Level (m)	12.646	12.761	12.761	12.798	13.175	13.250	13.626	13.626	14.052	14.052	14.477
Length (m)		17.869	7.365	17.550	17.550	15.178	15.178

MH Name	SW MH		SW MH85	
Hor Scale 500 Ver Scale 200 Datum (m) 0.000				
PN			S55.011	
Dia (mm)			300	
Slope (1:X)			100.1	
Cover Level (m)	11.800	12.200	14.250	
Invert Level (m)		9.704	11.206 / 11.500	
Length (m)			29.440	

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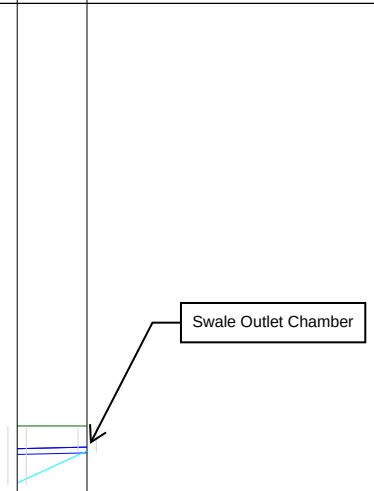
MH Name	SW MH73	
		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000		
PN		
Dia (mm)		
Slope (1:X)		
Cover Level (m)	16.700	16.700
Invert Level (m)	15.953	16.000
Length (m)		

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MH Name	SW MH74	
Hor Scale 500 Ver Scale 200 Datum (m) 4.000		
PN		
Dia (mm)		
Slope (1:X)		
Cover Level (m)	16.500	16.600
Invert Level (m)	15.949	16.000
Length (m)		

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MH Name	SW MH74			
Hor Scale 500 Ver Scale 200 Datum (m) 4.000				
PN				
Dia (mm)				
Slope (1:X)				
Cover Level (m)	16.500	16.500	16.500	
Invert Level (m)		15.826	15.826	15.850
Length (m)				

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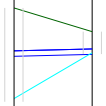
MH Name	SW MH75		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.130	16.500	
Invert Level (m)	15.848	15.900	
Length (m)			

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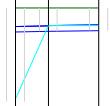
MH Name	SW MH75		
Hor Scale 500 Ver Scale 200 Datum (m) 4.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.130	17.130	17.130
Invert Level (m)		16.509	16.530
Length (m)			

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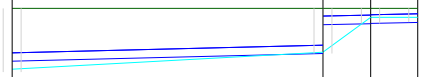
MH Name	SW MH77	SW MH76			
Hor Scale 500 Ver Scale 200 Datum (m) 3.000					
PN		S61.002			
Dia (mm)		225			
Slope (1:X)		100.0			
Cover Level (m)	16.170	16.170	16.170	16.170	
Invert Level (m)	14.769	14.975	15.768	15.800	
Length (m)		20.583			

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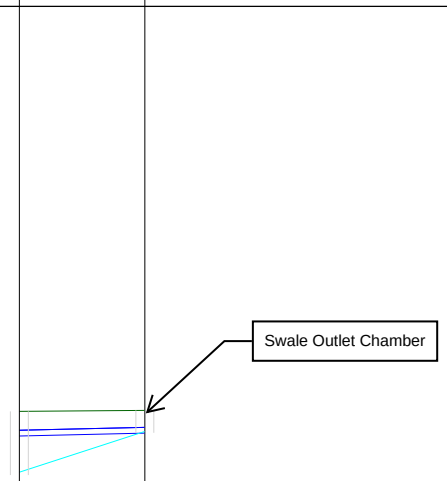
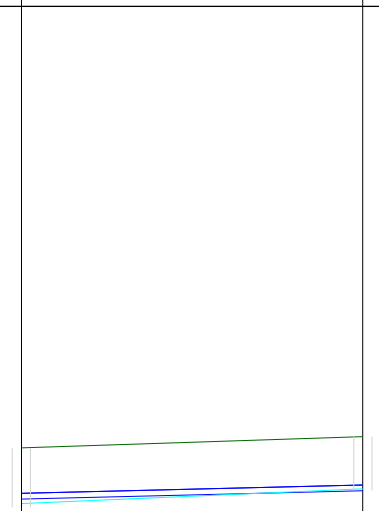
MH Name	SW MH-Swale13	MH-Swale13	
Hor Scale 500 Ver Scale 200 Datum (m) 3.000			
PN		S62.000	
Dia (mm)		150	
Slope (1:X)		100.0	
Cover Level (m)	16.170	16.200	
Invert Level (m)	15.517	15.600	
Length (m)		8.317	

MH Name	SW MH78		
			
Hor Scale 500 Ver Scale 200 Datum (m) 3.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	15.700	15.700	15.700
Invert Level (m)		15.062	15.062	15.100
Length (m)			

MH Name	SW MH80	SW MH79	
			
PN		S64.000	
Dia (mm)		150	
Slope (1:X)		100.0	
Cover Level (m)	15.200	15.500	
Invert Level (m)	13.849	14.075	
Length (m)		22.594	

MH Name	SW MH80		
			
Hor Scale 500 Ver Scale 200 Datum (m)2.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	15.200	15.195	15.190
Invert Level (m)		14.574	14.574	14.600
Length (m)			

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MH Name	SW MH81		
			
Hor Scale 500 Ver Scale 200 Datum (m)2.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	14.850	14.750	
Invert Level (m)		14.250	
Length (m)			

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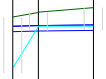
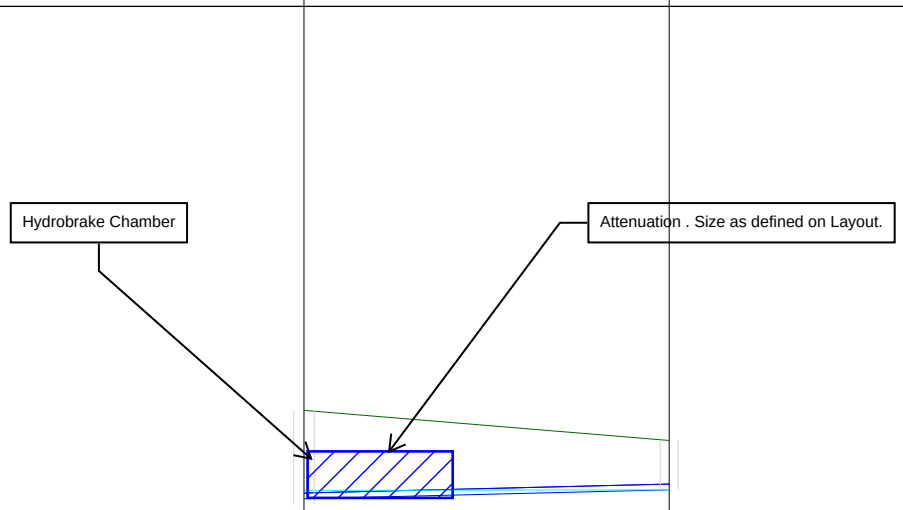
MH Name	SW MH83	SW MH82	SW MHD82	SW MHDP82
Hor Scale 500 Ver Scale 200 Datum (m) 2.000				
PN		S67.002	S67.001	S67.000
Dia (mm)		150	150	150
Slope (1:X)		100.0	100.0	100.0
Cover Level (m)	14.500	15.400	15.200	15.000
Invert Level (m)	13.176	13.375	14.070 14.135	14.135 14.200
Length (m)		19.935	6.502	6.502

MH Name	SW MH84		
			
Hor Scale 500 Ver Scale 200 Datum (m)2.000			
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	14.250	14.500	
Invert Level (m)		13.883 13.900	
Length (m)			

MH Name	SW MH86	SW MH86	
			
Hor Scale 500 Ver Scale 200 Datum (m)-1.000			
PN		S69.000	
Dia (mm)		150	
Slope (1:X)		100.0	
Cover Level (m)	12.200	11.400	
Invert Level (m)	9.858	10.100	
Length (m)		24.177	