PINNACLE
CONSULTING ENGINEERS

DB11.1, Profile Park, Grange Castle, Lucan, Co. Dublin

Engineering Planning Report

July 2021

P210501

VANTAGE™
DATA CENTERS

Document No.: DUB11.1-RP-00-C001-V0-WS3-PIN

STRUCTURAL · CIVIL · DUE DILIGENCE · ENGINEERING MASTERPLANNING
FLOOD MANAGEMENT · INFRASTRUCTURE DESIGN
PRE-DEVELOPMENT ENGINEERING · BIM · TRANSPORTATION

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APPROVALS

	Name	Signature	Position	Date
Prepared by	S. O'Reilly		Associate	10/07/2021
Reviewed by	J. Mayer		Director	11/07/2021
Approved by	J. Mayer		Director	12/07/2021

REVISIONS

Revision By	Date	Context

VERSIONS

Number	By	Date	Context
0	S. O'Reilly	15/07/2021	WS3 Submission

Executive Summary

This report was prepared for South Dublin County Council in connection with the planning application for a data centre development and addresses the existing and proposed civil infrastructure, for the proposed development, located in Profile Park, Grange Castle Business Park, Lucan, Co. Dublin.

Vantage Data Centers Dub 11 Ltd. are applying for permission for development at this site that

The site is bounded to the south by an estate road known as Falcon Avenue, to the north by Nangor Road (R134), to the east by existing greenfield and to the west by existing commercial units and greenfield.

The report should be read in conjunction with our engineering planning drawings, and deals with existing foul, surface water and water mains present within the surrounding area, and the proposals for the site with regards to these services.

The report also discusses the ground conditions present on the site, the current proposals for achieving the development plateau and sustainability measures incorporated with the development.

Vantage Data Centers Dub 11 Ltd. are applying for permission for development at this site that includes an abandoned single storey residential property on the New Nangor Road (R134), Dublin 22; and on land within the townlands of Ballybane and Kilbride within Profile Park, Clondalkin, Dublin 22 on an overall site of 8.7 hectares.

The development will consist of the demolition of the abandoned single storey dwelling and associated outbuilding (206sqm); and the construction of 2 no. two storey data centers with plant at roof level of each facility and associated ancillary development that will have a gross floor area of 40,589sqm that will consist of the following:

- 1 no. two storey data center (Building 11) that will be located to the south of the site and will have a gross floor area of 24,667sqm. It will include 22 no. emergency generators located at ground floor level within a compound to the western side of the data center with associated flues that will be 22.3m in height;
- 1 no. two storey data center (Building 12) that will be located to the north of the site, and to the immediate north of Building 11 and will have a gross floor area of 12,915sqm. It will include 11 no. emergency generators located at ground floor level within a compound to the western side of the data center with associated flues that will be 22.3m in height;
- Each of the two data centers will includes data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas, and plant including PV panels at roof level as well as a separate house generator for each facility that will provide emergency power to the admin and ancillary spaces. Each generator will include a diesel tank and there will be a refuelling area to serve the proposed emergency generators;
- The overall height of each data center apart from the flues and plant at roof level is c. 14.23m above the finished floor level;
- Construction of internal road network and circulation areas, with main entrance off Falcon Avenue to the south, as well as a secondary vehicular access off Legacy Drive to the

south-west, both from within Profile Park; footpaths, provision of 144 no. car parking spaces, and 66 no. cycle parking spaces;

- single storey step-up substation (38sqm) as well as 2 no. single storey switch substations (121sqm);
- AGI Gas Regulator compound that include 3 no. single storey buildings (134sqm)
- construction of a gas powered generation plant in the form of a 13m high single storey building with a gross floor area of 2,714sqm that will contain 10 gas generators with associated flues that will be 25m in height, and grouped in pairs and threes. The Gas Plant will be located to the west of Building 11;
- Ancillary site development works, that will include reorientation of the Baldonnel Stream, biodiversity management initiatives, attenuation ponds and the installation and connection to the underground foul and storm water drainage network, and installation of utility ducts and cables, that will include the drilling and laying of ducts and cables under the internal road network within Profile Park. Other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, services road, entrance gates, sprinkler tanks and pump room; and
- A temporary gas powered generation plant within a fenced yard containing 21 no. generator units in containers, each with associated flues (each 25m high), 12 transformers and 10 containers of controls to be located to the west of, and associated with the first phase of Building 11, and will be required for a period of up to 2 years if connection to the national grid is delayed. This temporary plant will not be built if the connection to the national grid is in place prior to the operation of Building 11.

The development will be accessed from Falcon Avenue and Legacy Drive from within the Profile Park Business Park that contains an access from the New Nangor Road (R134). An Environmental Impact Assessment Report (EIAR) has been submitted with this application.

1 Introduction

The applicant proposes to construct 2No. two-storey data centres and associated office areas, which will be accessed off Falcon Avenue to the south. The purpose of this report is to address the civil infrastructural aspects of the proposed data centre development, located in Profile Park, Grange Castle Business Park, Lucan, Co. Dublin.

The total subject site area extends to circa 21.49 acres (8.7 ha) and is currently a greenfield site. The site is bounded to the north by the New Nangor Road, to the south by Falcon Avenue and to the east by existing greenfield and to the west by existing commercial units and greenfield.

There are no known public sewer drainage pipes or watermains, presently located on the subject site.

This report has been prepared to outline the existing and proposed drainage, pollution control measures and water main infrastructure, in order to support the proposed development application.

The location of the site is indicated on the map extract below - Figure 1.

FIGURE 1 - Site Location (Source Google Maps)

2 Existing Drainage & Watermain Services

2.1 Existing Foul Drainage Networks

South Dublin County Council record drawings have identified 3 No. 150mm / 225mm Ø spur connections, located adjacent to the southern boundary of the property & Profile Park. These spur connections were left out to facilitate development of these lands. These spur connections are joined into the reticulation netwrok for Profile Park.

The existing foul sewer reticulation network has adequate capacity to cater for the proposed effluent discharge from the subject site and there are no known issues noted with the sewer reticulation network.

2.2 Existing Surface Water Drainage Networks

The topographical survey as carried out has identified an open channel / stream which runs along a portion of the eastern boundary, up to the north, prior to discharging to the west into a culverted system beneath Grange Castle Motor Company. This ditch network then runs in a westerly direction via a tributary into the Camac River.

The aforementioned open ditch network has been identified as having capacity to accommodate the proposed discharge from the subject site.

2.3 Existing Water Main Network

South Dublin County Council record drawings have identified an existing 6" (160mm) Ø main located along the southern boundary of the property, within Falcon Avenue adjacent to the subject site. 2No. 160mm Ø capped connections with sluice valves, have been left off the aforementioned water main, in order to facilitate development of these lands.

There is also an existing 700mm Ø trunk water main running parallel to the New Nangor Road adjacent to the northern boundary of the subject site.

From discussions with the South Dublin County Council, it is understood that there is adequate capacity within the existing watermain network to supply the proposed development.

3 Proposed Site Drainage & Water Supply

3.1 Proposed Foul Water Drainage

It is proposed to discharge foul water from the proposed development, via a 225mm Ø gravity foul sewer outfall, laid from MH's FWMH 1.1 & 2.1 and discharge into the existing 225mm Ø spur connection laid across Falcon Avenue, which is connected to the existing foul sewer network laid along the western edge of Falcon Avenue.

The office building contains 6 No. WC's, with a predicted maximum number of daily staff being in the region of circa 144 people, over a 24hr period. Based on Irish Water's Code of Practice of 150ltr/hd/day, the peak wastewater flow will not be in excess of circa 0.25l/s (@1DWF) & a peak discharge of 1.5l/s (@6DWF).

The proposed network connects into the EX MH FW11, with an invert level of 70.405m, prior to the ultimate outfall discharging into the Profile Park reticulation network, - refer Drawing No. DB11.1-DR-UG-C128-V0-WS3-PIN.

All on-site foul sewers have been designed to be a minimum 225mm Ø diameter pipes, with gradients designed to achieve self-cleansing velocities.

3.2 Proposed Surface Water Drainage

Storm water from the proposed development has been designed in accordance with the GDSDS and ensures that Best Management Practice has been incorporated into the design.

It should be noted that the subject site currently comprises a greenfield site and the proposed surface water measures are aimed at improving the general surface water management of the site, by introducing interceptors, attenuation measures and by restricting the ultimate discharge, etc.

Storm water from the rear roof areas of the proposed building units, will be directed via rain water pipes into an on-site reticulation system. The outflow from this system will be connected into the surface water drainage network collecting run-off from the road areas and will be ultimately discharged into a stormwater storage pond / below ground Stormtech tanks (or similar approved) - refer Drawing No. DB11.1-DR-UG-C128-V0-WS3-PIN.

The front roof areas of the buildings drain into the permeable paving sub-base, prior to the ultimate discharge into the ditch / stream to the east.

Based on the contributing area for this current application, i.e. circa 22,400m^2 (2.24Ha), the total attenuation volume required has been calculated as being circa 1,204m^3, which will be provided for as mentioned above, in a storage pond, permeable paving and a below ground storage tank - Refer Appendix B for Surface Water Calculations.

The following volumes have been provided for within the storage elements:-

- Tank 1 provides a storage volume of 500m^3
- Permeable paving sub-base
- The attenuation pond comprises a storage volume of circa 1,600m^3

It should be noted that Tanks 1 discharges into the aforementioned ditch / stream to the west.

Storm water from all car park areas and access roads / delivery areas will be drained as follows:-

- A series of on-site gullies and channels draining into a separate system of below ground gravity storm water sewers
- Permeable Paving

Prior to discharging into the proposed pond, the storm water from the car park and access roads, which is drained via the methods as described above, will be directed through an appropriately sized Conder Separators (or similar approved) petrol interceptor - refer Appendix A for Interceptor Details.

Site investigations have been carried out and the results have shown that the existing sub-soil would provide inadequate soil infiltration rates and thus it is not practical to install a soakaway system. The storm water drainage within the entire development has been designed to accommodate a 1:2 year storm frequency. The pond, attenuation tank and permeable paving sub-base areas have been designed to accommodate a 1:100 year storm event + 20% climate change.

The outflow from the proposed development, will be restricted by way of a Hydrobrake facility, which will limit the total discharge to 4.4l/s, which is the calculated QBAR greenfield run-off rate - refer Appendix B for Surface Water Calculations.

The surface water discharge for this application will incorporate the road areas, parking, service yard area and the roof water from the proposed data halls, which then ultimately feeds into the existing network as previously mentioned. Refer Dwg. No. DB11.1-DR-XX-C130-V0-WS3-PIN (External Works Plan), for a drawing indicating the various surface areas of this application; all areas are hardstanding of various types, with the respective coefficients detailed below:-

- Access Road – Tarmac (2,504m^2) / c = 0.80
- Data Hall Roof Area (5,414m^2) / c = 1.00
- Yard Slab Area – Concrete (2,032m^2) / c = 0.80
- Open Space / Landscaping (5,214m^2) / c = 0.30
- Permeable Paving & Parking Areas (5,989m^2) / c = 0.60
- Concrete Footpath (1,953m^2) / c = 0.8
- Standard Road Tarmac (1,103m^2) / c = 0.8

3.3 Proposed Water Mains

It is intended to serve the proposed development via connection off the 150mm Ø network, as located in Falcon Avenue - Refer Drawing No. DB11.1-DR-SP-C123-V0-WS3-PIN.

Hydrants will be installed in accordance with the Requirements of the Building Regulations and in accordance with the recommendations contained in the Technical Guidance Documents, Section B – Fire Safety, dated 2006, and these are detailed on our engineering drawings.

Water demand for the development has been based on Irish Water's criteria, i.e. 150 litres/hd/day = 21,600 litres/hd/day (based on 144 PE) = 0.250 litres/second.

Avg. Demand = 0.250 l/s x 1.25 = 0.312 litres/second

Peak Demand = 0.312 l/s x 5 = 1.560 litres/second

Water meters, sluice valves and hydrants, in line with Irish Water requirements and specifications, will be installed at the connections onto the aforementioned existing water mains, as required. A Pre-Connection Enquiry application has been submitted to Irish Water in respect of the water supply and we are still awaiting a response to same.

3.4 Standard Drainage Details

All standard drainage details including manhole details, pipe bedding, channels, hydrants etc. have been included within the planning pack. Details of the types and construction methods will be agreed with the local authority prior to construction.

Drains generally will consist of PVC (to IS 123) or concrete spigot and socket pipes to (IS 6).

Drains shall be laid to comply with the Requirements of the Building Regulations 1997 and in accordance with the recommendations contained in the Technical Guidance Documents, Section H.

Strict separation of surface water and foul sewerage will be imposed on the development. Drains will be laid out to minimise the risk of inadvertent connections of sinks, dishwashers etc. to the surface water system.

In order to minimise the risk of floating contamination of the surface water system, road gullies will be precast trapped gullies to BS5911:Part2:1982.

Concrete bed and surround to the pipe runs will be used where the cover to the pipes is less than 900mm, where the pipes are sufficiently close to the building, or where the pipe runs are below the ground floor slab.

All works are to be carried out in accordance with Irish Water's Code of Practice for Water Infrastructure, dated July 2020 : Document IW-CDS-5020-03 and any subsequent revisions thereof.

4 Surface & Groundwater Impacts

4.1 Construction Phase

Water pollution will be minimised by the implementation of good construction practices. Such practices will include adequate bunding for oil containers, wheel washers and dust suppression on site roads, and regular plant maintenance. The Construction Industry Research and Information Association provides guidance on the control and management of water pollution from construction sites in their publication Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors – C532 CIRIA Report (Masters-Williams *et al*, 2001), which provides information on these issues.

Pollutants can commonly include suspended solids, oil, chemicals, cement, cleaning materials and paints. These can enter controlled waters in various ways:

- directly into a watercourse
- via drains or public sewers
- via otherwise dry ditches
- in old field drains
- by seepage into groundwater systems
- through excavations into underlying aquifers
- by disturbance of an already contaminated site

The proximity of the site to streams, aquifers and water abstractions; potential sources, pathways and impacts of pollution; and the historical uses of the site and nearby areas should be examined early in project planning and design, to ensure that suitable redesign and mitigation measures are undertaken as necessary.

During construction, careful management and planning will help minimise water pollution. This may include adequate bunding of all oil tanks, wheel washers and dust suppression on haul roads, particular care to be taken near watercourses, and regular plant maintenance.

A contingency plan for pollution emergencies should also be developed and regularly updated, which would identify the actions to be taken in the event of a pollution incident.

The CIRIA document (2001), recommends that a contingency plan for pollution emergencies should address the following:

- containment measures
- emergency discharge routes
- list of appropriate equipment and clean-up materials
- maintenance schedule for equipment
- details of trained staff, location, and provision for 24-hour cover
- details of staff responsibilities
- notification procedures to inform the relevant environmental protection authority
- audit and review schedule

- telephone numbers of statutory water undertakers and local water company
- list of specialist pollution clean-up companies and their telephone numbers

4.2 Operational Phase

The sources of pollution that could potentially have an effect on surface or groundwater during the operational phase of the development will be oil and fuel leaks from parked cars, service vehicles, HGV delivery's etc. Hydrocarbon interceptors will be provided on storm water drainage sewers from car parking areas as required.

Storm water attenuation measures will be incorporated into the scheme as mentioned previously.

It is not anticipated that flooding of the site will occur, due to the fact that there is no historical data, which refers to any past flooding on this site.

4.3 Mitigation Measures

The construction management of the building project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and groundwater contamination.

All appropriate methods will be utilised to ensure that surface water arising during the course of construction activities will contain minimum sediment, prior to the ultimate discharge to the proposed attenuation pond / tanks and the existing stream.

Storm water attenuation measures will be incorporated into the scheme as mentioned previously. Hydrocarbon interceptors will be provided on storm water drainage sewers from service yard areas as necessary. Grease traps will be installed on foul sewers where necessary.

Best practice in design and construction will be employed for the installation of surface water and sanitary drainage.

5 Sustainability

5.1 Site Development

In order to minimize material export and import to the site and the impact of this on the surrounding road network, we are proposing to maintain existing on-site levels as far as is practical. Where this is not feasible, a terrain model has been produced, which will indicate the volumes of cut/fill material, based on the proposed levels and a levels balance will be struck across the site, thereby mitigating any import/export of material for site development.

5.2 Site Drainage

Storm water drainage proposals for the site have been designed in accordance with the GDSDS and incorporate on site storm water attenuation in order to limit discharge of storm water from the developed site to the equivalent Q-bar run-off rates.

The attenuation system proposed is in keeping with other developments within Grange Castle Business Park. The pond area not only provides flood storage, but also provides ecological benefits as well.

6 Conclusion

In conclusion, the proposed development of the site by the applicant, for use as a Data Centre development, is considered a suitable use of the site. Local infrastructure has the capacity to serve the proposed development.

The site will be developed in a sustainable manner, in order to minimise the impact of the development during construction and throughout the lifespan of the proposed development.

Accordingly, there are no reasons in relation to the drainage elements as to why this scheme should not be granted planning permission, and with this in mind, the Planning Authority is respectfully requested to recommend a grant of planning permission.

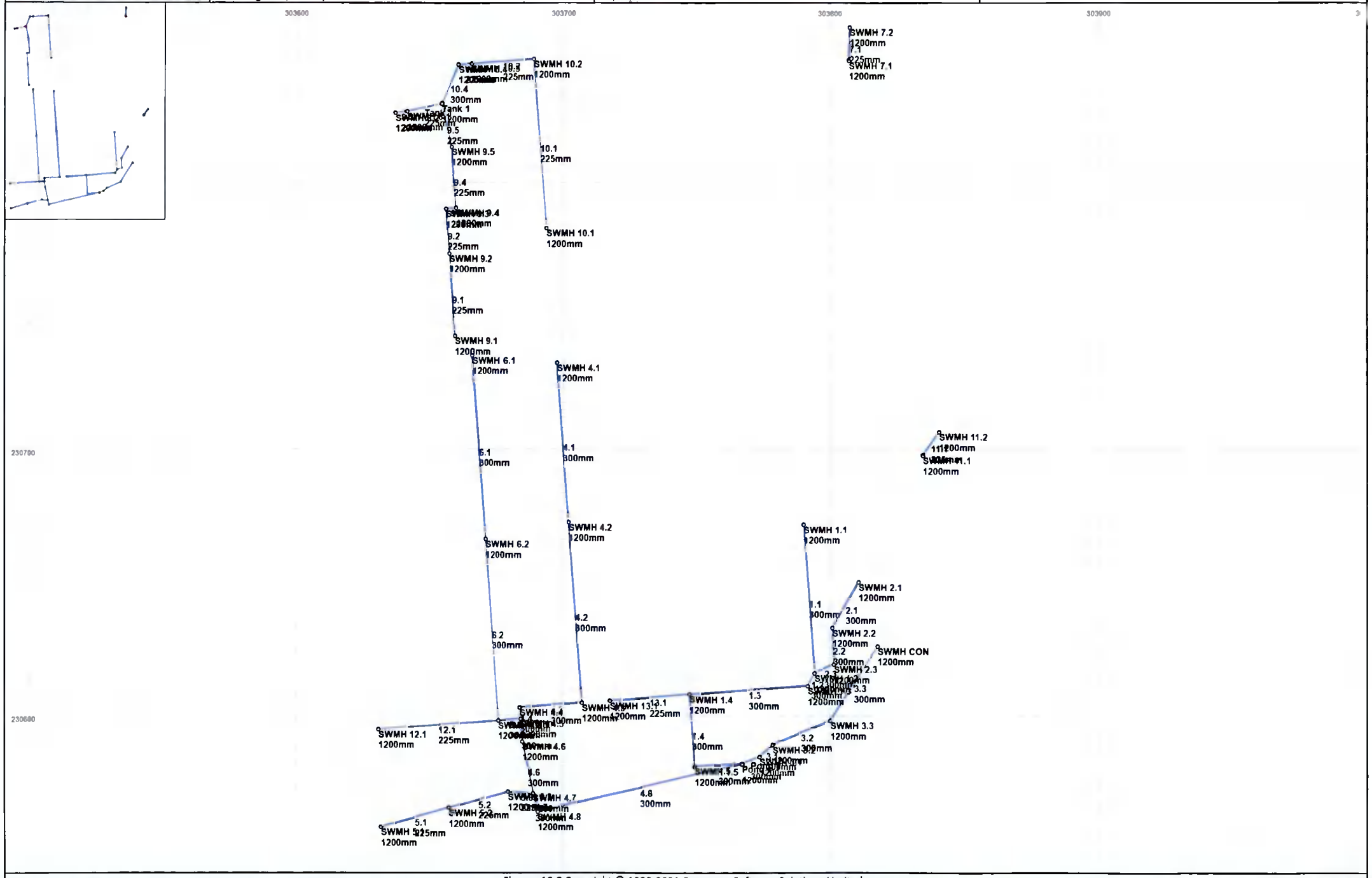
Appendix A

Conder Petrol Interceptor Details

Appendix B

Surface Water Calculations

PINNACLE CONSULTING ENGINEERS	Pinnacle Engineering Grosvenor Court 67a Patrick Street Dun Laoghaire, County Dublin	File: Apollo Hydraulic Model.pfd Network: Storm Network Francois Jansen van Rensburg 16/08/2021	Page 1 Apollo Hydraulic Model Rev 1



Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	40.0
Additional Flow (%)	20	Minimum Velocity (m/s)	0.70
FSR Region	Scotland and Ireland	Connection Type	Level Inverts
M5-60 (mm)	16.800	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.800
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	15.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SWMH 1.1	0.238	5.00	74.060	1200	303790.379	230671.764	1.256
SWMH 1.2			74.060	1200	303794.420	230615.963	1.472
SWMH 1.3			74.070	1200	303791.945	230611.205	1.500
SWMH 1.4			74.080	1200	303747.389	230607.876	1.682
SWMH 1.5			73.800	1200	303749.412	230580.792	1.500
SWMH 2.1	0.207	5.00	73.630	1200	303810.851	230650.189	0.888
SWMH 2.2			73.830	1200	303801.029	230633.031	1.164
SWMH 2.3			73.880	1200	303801.612	230619.333	1.265
SWMH 3.1			73.800	1200	303773.730	230584.554	1.650
SWMH 3.2			73.800	1200	303778.663	230589.105	1.700
SWMH 3.3			74.480	1200	303800.291	230598.193	2.500
SWMH CON			74.090	1200	303817.961	230626.100	2.270
SWMH 4.1	0.644	5.00	74.090	1200	303697.666	230732.518	0.950
SWMH 4.2			74.080	1200	303702.022	230672.672	1.175
SWMH 4.3			74.170	1200	303706.969	230604.856	1.532
SWMH 4.4			73.770	1200	303683.675	230603.116	1.230
SWMH 4.5			73.770	1200	303683.995	230598.861	1.270
SWMH 4.6			73.690	1200	303684.630	230590.321	1.240
SWMH 4.7			73.600	1200	303688.671	230570.937	1.260
SWMH 4.8			73.600	1200	303690.454	230563.967	1.300
SWMH 5.1	0.173	5.00	74.560	1200	303631.952	230558.259	1.200
SWMH 5.2			74.050	1200	303657.223	230565.296	1.200
SWMH 5.3			73.600	1200	303679.571	230571.518	1.064
SWMH 6.1	0.924	5.00	74.050	1200	303665.939	230735.265	0.946
SWMH 6.2			74.050	1200	303670.917	230666.328	1.218
SWMH 6.3	0.164	5.00	73.980	1200	303675.828	230598.251	1.416
SWMH 7.1	0.636	5.00	73.360	1200	303807.107	230845.748	1.160
SWMH 7.2			73.000	1200	303807.382	230858.280	1.300
SWMH 8.1			73.500	1200	303641.484	230826.729	1.600
SWMH 8.2			73.000	1200	303637.185	230826.204	1.200
SWMH 9.1	0.731	5.00	73.940	1200	303659.509	230742.509	1.300
SWMH 9.2			73.930	1200	303657.356	230773.390	1.480
SWMH 9.3			73.930	1200	303656.119	230790.126	1.580

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SWMH 9.4			73.900	1200	303659.893	230790.470	1.590
SWMH 9.5			73.950	1200	303658.225	230813.431	1.950
SWMH 10.1	0.310	5.00	74.090	1200	303693.616	230782.956	1.430
SWMH 10.2			74.080	1200	303688.862	230846.379	1.840
SWMH 10.3			73.840	1200	303665.592	230844.699	1.740
SWMH 10.4			73.950	1200	303660.748	230844.335	1.950
SWMH 11.1	0.556	5.00	73.190	1200	303834.725	230697.653	1.190
SWMH 11.2			73.000	1200	303840.774	230706.535	1.200
SWMH 12.1	0.087	5.00	74.280	1200	303630.983	230594.900	1.280
SWMH 13.1		15.00	74.090	1200	303717.484	230605.642	1.470
Tank 1			73.950	1200	303654.576	230829.617	1.999
Pond 1			73.600	1200	303767.139	230581.821	1.400
Cat 4	0.302		73.710	1200			0.600
Cat 7	0.148		73.770	1200			0.600
Cat 9	0.080		73.710	1200			0.600
Cat 15	0.143		73.750	1200			0.600

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.1	SWMH 1.1	SWMH 1.2	55.947	0.600	72.804	72.588	0.216	259.0	300	6.33	50.0
1.2	SWMH 1.2	SWMH 1.3	5.363	0.600	72.588	72.570	0.018	297.9	300	6.38	50.0
1.3	SWMH 1.3	SWMH 1.4	44.680	0.600	72.570	72.398	0.172	259.8	300	7.18	50.0
1.4	SWMH 1.4	SWMH 1.5	27.159	0.600	72.398	72.300	0.098	277.1	300	7.55	50.0
1.5	SWMH 1.5	Pond 1	17.757	0.600	72.300	72.200	0.100	177.6	300	7.97	50.0
2.1	SWMH 2.1	SWMH 2.2	19.770	0.600	72.742	72.666	0.076	260.1	300	5.47	50.0
2.2	SWMH 2.2	SWMH 2.3	13.710	0.600	72.666	72.615	0.051	268.8	300	5.79	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.1	0.972	68.7	38.7	0.956	1.172	0.238	0.0	161	1.000
1.2	0.905	64.0	72.4	1.172	1.200	0.445	0.0	300	0.917
1.3	0.971	68.6	72.4	1.200	1.382	0.445	0.0	267	1.089
1.4	0.939	66.4	72.4	1.382	1.200	0.445	0.0	300	0.951
1.5	1.177	83.2	72.4	1.200	1.100	0.445	0.0	217	1.319
2.1	0.970	68.6	33.7	0.588	0.864	0.207	0.0	149	0.966
2.2	0.954	67.4	33.7	0.864	0.965	0.207	0.0	150	0.953

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.3	SWMH 2.3	SWMH 1.2	7.942	0.600	72.615	72.588	0.027	294.1	300	5.94	50.0
Pond 1	Pond 1	SWMH 3.1	7.135	0.600	72.200	72.150	0.050	142.7	300	11.59	50.0
3.1	SWMH 3.1	SWMH 3.2	6.712	0.600	72.150	72.100	0.050	134.2	300	11.75	50.0
3.2	SWMH 3.2	SWMH 3.3	23.460	0.600	72.100	71.980	0.120	195.5	300	12.31	50.0
3.3	SWMH 3.3	SWMH CON	33.031	0.600	71.980	71.820	0.160	206.4	300	13.09	50.0
4.1	SWMH 4.1	SWMH 4.2	60.004	0.600	73.140	72.905	0.235	255.3	300	6.43	50.0
4.2	SWMH 4.2	SWMH 4.3	67.996	0.600	72.905	72.638	0.267	254.7	300	8.05	50.0
4.3	SWMH 4.3	SWMH 4.4	23.359	0.600	72.638	72.540	0.098	238.4	300	8.60	50.0
4.4	SWMH 4.4	SWMH 4.5	4.267	0.600	72.540	72.500	0.040	106.7	300	8.70	50.0
4.5	SWMH 4.5	SWMH 4.6	8.564	0.600	72.500	72.450	0.050	171.3	300	8.90	50.0
4.6	SWMH 4.6	SWMH 4.7	19.801	0.600	72.450	72.340	0.110	180.0	300	9.38	50.0
4.7	SWMH 4.7	SWMH 4.8	7.194	0.600	72.340	72.300	0.040	179.9	300	9.55	50.0
4.8	SWMH 4.8	Pond 1	78.736	0.600	72.300	72.200	0.100	787.4	300	11.42	50.0
5.1	SWMH 5.1	SWMH 5.2	26.232	0.600	73.360	72.850	0.510	51.4	225	5.62	50.0
5.2	SWMH 5.2	SWMH 5.3	23.198	0.600	72.850	72.536	0.314	73.9	225	6.18	50.0
5.3	SWMH 5.3	SWMH 4.7	9.119	0.600	72.536	72.424	0.112	81.4	225	6.39	50.0
6.1	SWMH 6.1	SWMH 6.2	69.116	0.600	73.104	72.832	0.272	254.1	300	6.65	50.0
6.2	SWMH 6.2	SWMH 6.3	68.254	0.600	72.832	72.564	0.268	254.7	300	8.27	50.0
6.3	SWMH 6.3	SWMH 4.5	8.190	0.600	72.564	72.528	0.036	227.5	300	8.42	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
2.3	0.911	64.4	33.7	0.965	1.172	0.207	0.0	154	0.921
Pond 1	1.314	92.9	396.3	1.100	1.350	2.437	0.0	300	1.331
3.1	1.355	95.8	396.3	1.350	1.400	2.437	0.0	300	1.372
3.2	1.121	79.2	396.3	1.400	2.200	2.437	0.0	300	1.135
3.3	1.090	77.1	396.3	2.200	1.970	2.437	0.0	300	1.104
4.1	0.979	69.2	104.7	0.650	0.875	0.644	0.0	300	0.992
4.2	0.980	69.3	104.7	0.875	1.232	0.644	0.0	300	0.993
4.3	1.014	71.7	104.7	1.232	0.930	0.644	0.0	300	1.027
4.4	1.522	107.6	104.7	0.930	0.970	0.644	0.0	241	1.724
4.5	1.198	84.7	295.8	0.970	0.940	1.819	0.0	300	1.214
4.6	1.168	82.6	295.8	0.940	0.960	1.819	0.0	300	1.184
4.7	1.169	82.6	324.0	0.960	1.000	1.992	0.0	300	1.184
4.8	0.552	39.1	324.0	1.000	1.100	1.992	0.0	300	0.560
5.1	1.828	72.7	28.1	0.975	0.975	0.173	0.0	97	1.715
5.2	1.523	60.5	28.1	0.975	0.839	0.173	0.0	108	1.495
5.3	1.450	57.7	28.1	0.839	0.951	0.173	0.0	111	1.443
6.1	0.981	69.4	150.3	0.646	0.918	0.924	0.0	300	0.994
6.2	0.980	69.3	150.3	0.918	1.116	0.924	0.0	300	0.993
6.3	1.038	73.4	191.1	1.116	0.942	1.175	0.0	300	1.051

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
7.1	SWMH 7.1	SWMH 7.2	12.535	0.600	72.200	71.700	0.500	25.1	225	5.30	50.0
Tank 1	Tank 1	SWMH 8.1	13.407	0.600	72.000	71.900	0.100	134.1	225	7.79	50.0
8.1	SWMH 8.1	SWMH 8.2	4.331	0.600	71.900	71.800	0.100	43.3	225	7.90	50.0
9.1	SWMH 9.1	SWMH 9.2	30.956	0.600	72.640	72.450	0.190	162.9	225	5.74	50.0
9.2	SWMH 9.2	SWMH 9.3	16.782	0.600	72.450	72.350	0.100	167.8	225	6.14	50.0
9.3	SWMH 9.3	SWMH 9.4	3.790	0.600	72.350	72.310	0.040	94.8	225	6.22	50.0
9.4	SWMH 9.4	SWMH 9.5	39.506	0.600	72.310	72.000	0.310	127.4	225	7.16	50.0
9.5	SWMH 9.5	Tank 1	16.592	0.600	72.000	71.951	0.049	338.6	225	7.55	40.0
10.1	SWMH 10.1	SWMH 10.2	63.601	0.600	72.660	72.240	0.420	151.4	225	6.51	50.0
10.2	SWMH 10.2	SWMH 10.3	23.331	0.600	72.240	72.100	0.140	166.7	225	7.07	50.0
10.3	SWMH 10.3	SWMH 10.4	18.677	0.600	72.100	72.000	0.100	186.8	225	7.48	50.0
10.4	SWMH 10.4	Tank 1	15.960	0.600	72.000	71.953	0.047	339.6	300	7.79	40.0
11.1	SWMH 11.1	SWMH 11.2	10.746	0.600	72.000	71.800	0.200	53.7	225	5.25	50.0
12.1	SWMH 12.1	SWMH 6.3	44.970	0.600	73.000	72.564	0.436	103.1	225	6.07	50.0
13.1	SWMH 13.1	SWMH 1.4	29.988	0.600	72.620	72.398	0.222	135.1	225	5.71	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
7.1	2.623	104.3	103.4	0.935	1.075	0.636	0.0	184	2.975
Tank 1	1.127	44.8	169.3	1.725	1.375	1.041	0.0	225	1.148
8.1	1.993	79.2	169.3	1.375	0.975	1.041	0.0	225	2.030
9.1	1.021	40.6	118.9	1.075	1.255	0.731	0.0	225	1.040
9.2	1.006	40.0	118.9	1.255	1.355	0.731	0.0	225	1.025
9.3	1.343	53.4	118.9	1.355	1.365	0.731	0.0	225	1.368
9.4	1.156	46.0	118.9	1.365	1.725	0.731	0.0	225	1.178
9.5	0.705	28.0	95.1	1.725	1.774	0.731	0.0	225	0.718
10.1	1.060	42.1	50.4	1.205	1.615	0.310	0.0	225	1.080
10.2	1.010	40.1	50.4	1.615	1.515	0.310	0.0	225	1.028
10.3	0.953	37.9	50.4	1.515	1.725	0.310	0.0	225	0.971
10.4	0.847	59.9	40.3	1.650	1.697	0.310	0.0	181	0.908
11.1	1.788	71.1	90.4	0.965	0.975	0.556	0.0	225	1.821
12.1	1.287	51.2	14.1	1.055	1.191	0.087	0.0	80	1.102
13.1	1.123	44.6	0.0	1.245	1.457	0.000	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.1	55.947	259.0	300	Circular	74.060	72.804	0.956	74.060	72.588	1.172
1.2	5.363	297.9	300	Circular	74.060	72.588	1.172	74.070	72.570	1.200
1.3	44.680	259.8	300	Circular	74.070	72.570	1.200	74.080	72.398	1.382
1.4	27.159	277.1	300	Circular	74.080	72.398	1.382	73.800	72.300	1.200
1.5	17.757	177.6	300	Circular	73.800	72.300	1.200	73.600	72.200	1.100
2.1	19.770	260.1	300	Circular	73.630	72.742	0.588	73.830	72.666	0.864
2.2	13.710	268.8	300	Circular	73.830	72.666	0.864	73.880	72.615	0.965
2.3	7.942	294.1	300	Circular	73.880	72.615	0.965	74.060	72.588	1.172
Pond 1	7.135	142.7	300	Circular	73.600	72.200	1.100	73.800	72.150	1.350
3.1	6.712	134.2	300	Circular	73.800	72.150	1.350	73.800	72.100	1.400
3.2	23.460	195.5	300	Circular	73.800	72.100	1.400	74.480	71.980	2.200
3.3	33.031	206.4	300	Circular	74.480	71.980	2.200	74.090	71.820	1.970
4.1	60.004	255.3	300	Circular	74.090	73.140	0.650	74.080	72.905	0.875
4.2	67.996	254.7	300	Circular	74.080	72.905	0.875	74.170	72.638	1.232
4.3	23.359	238.4	300	Circular	74.170	72.638	1.232	73.770	72.540	0.930
4.4	4.267	106.7	300	Circular	73.770	72.540	0.930	73.770	72.500	0.970
4.5	8.564	171.3	300	Circular	73.770	72.500	0.970	73.690	72.450	0.940
4.6	19.801	180.0	300	Circular	73.690	72.450	0.940	73.600	72.340	0.960
4.7	7.194	179.9	300	Circular	73.600	72.340	0.960	73.600	72.300	1.000
4.8	78.736	787.4	300	Circular	73.600	72.300	1.000	73.600	72.200	1.100
5.1	26.232	51.4	225	Circular	74.560	73.360	0.975	74.050	72.850	0.975

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.1	SWMH 1.1	1200	Manhole	Adoptable	SWMH 1.2	1200	Manhole	Adoptable
1.2	SWMH 1.2	1200	Manhole	Adoptable	SWMH 1.3	1200	Manhole	Adoptable
1.3	SWMH 1.3	1200	Manhole	Adoptable	SWMH 1.4	1200	Manhole	Adoptable
1.4	SWMH 1.4	1200	Manhole	Adoptable	SWMH 1.5	1200	Manhole	Adoptable
1.5	SWMH 1.5	1200	Manhole	Adoptable	Pond 1	1200	Manhole	Adoptable
2.1	SWMH 2.1	1200	Manhole	Adoptable	SWMH 2.2	1200	Manhole	Adoptable
2.2	SWMH 2.2	1200	Manhole	Adoptable	SWMH 2.3	1200	Manhole	Adoptable
2.3	SWMH 2.3	1200	Manhole	Adoptable	SWMH 1.2	1200	Manhole	Adoptable
Pond 1	Pond 1	1200	Manhole	Adoptable	SWMH 3.1	1200	Manhole	Adoptable
3.1	SWMH 3.1	1200	Manhole	Adoptable	SWMH 3.2	1200	Manhole	Adoptable
3.2	SWMH 3.2	1200	Manhole	Adoptable	SWMH 3.3	1200	Manhole	Adoptable
3.3	SWMH 3.3	1200	Manhole	Adoptable	SWMH CON	1200	Manhole	Adoptable
4.1	SWMH 4.1	1200	Manhole	Adoptable	SWMH 4.2	1200	Manhole	Adoptable
4.2	SWMH 4.2	1200	Manhole	Adoptable	SWMH 4.3	1200	Manhole	Adoptable
4.3	SWMH 4.3	1200	Manhole	Adoptable	SWMH 4.4	1200	Manhole	Adoptable
4.4	SWMH 4.4	1200	Manhole	Adoptable	SWMH 4.5	1200	Manhole	Adoptable
4.5	SWMH 4.5	1200	Manhole	Adoptable	SWMH 4.6	1200	Manhole	Adoptable
4.6	SWMH 4.6	1200	Manhole	Adoptable	SWMH 4.7	1200	Manhole	Adoptable
4.7	SWMH 4.7	1200	Manhole	Adoptable	SWMH 4.8	1200	Manhole	Adoptable
4.8	SWMH 4.8	1200	Manhole	Adoptable	Pond 1	1200	Manhole	Adoptable
5.1	SWMH 5.1	1200	Manhole	Adoptable	SWMH 5.2	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
5.2	23.198	73.9	225	Circular	74.050	72.850	0.975	73.600	72.536	0.839
5.3	9.119	81.4	225	Circular	73.600	72.536	0.839	73.600	72.424	0.951
6.1	69.116	254.1	300	Circular	74.050	73.104	0.646	74.050	72.832	0.918
6.2	68.254	254.7	300	Circular	74.050	72.832	0.918	73.980	72.564	1.116
6.3	8.190	227.5	300	Circular	73.980	72.564	1.116	73.770	72.528	0.942
7.1	12.535	25.1	225	Circular	73.360	72.200	0.935	73.000	71.700	1.075
Tank 1	13.407	134.1	225	Circular	73.950	72.000	1.725	73.500	71.900	1.375
8.1	4.331	43.3	225	Circular	73.500	71.900	1.375	73.000	71.800	0.975
9.1	30.956	162.9	225	Circular	73.940	72.640	1.075	73.930	72.450	1.255
9.2	16.782	167.8	225	Circular	73.930	72.450	1.255	73.930	72.350	1.355
9.3	3.790	94.8	225	Circular	73.930	72.350	1.355	73.900	72.310	1.365
9.4	39.506	127.4	225	Circular	73.900	72.310	1.365	73.950	72.000	1.725
9.5	16.592	338.6	225	Circular	73.950	72.000	1.725	73.950	71.951	1.774
10.1	63.601	151.4	225	Circular	74.090	72.660	1.205	74.080	72.240	1.615
10.2	23.331	166.7	225	Circular	74.080	72.240	1.615	73.840	72.100	1.515
10.3	18.677	186.8	225	Circular	73.840	72.100	1.515	73.950	72.000	1.725
10.4	15.960	339.6	300	Circular	73.950	72.000	1.650	73.950	71.953	1.697
11.1	10.746	53.7	225	Circular	73.190	72.000	0.965	73.000	71.800	0.975

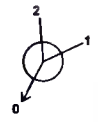
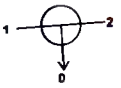
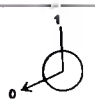
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
5.2	SWMH 5.2	1200	Manhole	Adoptable	SWMH 5.3	1200	Manhole	Adoptable
5.3	SWMH 5.3	1200	Manhole	Adoptable	SWMH 4.7	1200	Manhole	Adoptable
6.1	SWMH 6.1	1200	Manhole	Adoptable	SWMH 6.2	1200	Manhole	Adoptable
6.2	SWMH 6.2	1200	Manhole	Adoptable	SWMH 6.3	1200	Manhole	Adoptable
6.3	SWMH 6.3	1200	Manhole	Adoptable	SWMH 4.5	1200	Manhole	Adoptable
7.1	SWMH 7.1	1200	Manhole	Adoptable	SWMH 7.2	1200	Manhole	Adoptable
Tank 1	Tank 1	1200	Manhole	Adoptable	SWMH 8.1	1200	Manhole	Adoptable
8.1	SWMH 8.1	1200	Manhole	Adoptable	SWMH 8.2	1200	Manhole	Adoptable
9.1	SWMH 9.1	1200	Manhole	Adoptable	SWMH 9.2	1200	Manhole	Adoptable
9.2	SWMH 9.2	1200	Manhole	Adoptable	SWMH 9.3	1200	Manhole	Adoptable
9.3	SWMH 9.3	1200	Manhole	Adoptable	SWMH 9.4	1200	Manhole	Adoptable
9.4	SWMH 9.4	1200	Manhole	Adoptable	SWMH 9.5	1200	Manhole	Adoptable
9.5	SWMH 9.5	1200	Manhole	Adoptable	Tank 1	1200	Manhole	Adoptable
10.1	SWMH 10.1	1200	Manhole	Adoptable	SWMH 10.2	1200	Manhole	Adoptable
10.2	SWMH 10.2	1200	Manhole	Adoptable	SWMH 10.3	1200	Manhole	Adoptable
10.3	SWMH 10.3	1200	Manhole	Adoptable	SWMH 10.4	1200	Manhole	Adoptable
10.4	SWMH 10.4	1200	Manhole	Adoptable	Tank 1	1200	Manhole	Adoptable
11.1	SWMH 11.1	1200	Manhole	Adoptable	SWMH 11.2	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
12.1	44.970	103.1	225	Circular	74.280	73.000	1.055	73.980	72.564	1.191
13.1	29.988	135.1	225	Circular	74.090	72.620	1.245	74.080	72.398	1.457

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
12.1	SWMH 12.1	1200	Manhole	Adoptable	SWMH 6.3	1200	Manhole	Adoptable
13.1	SWMH 13.1	1200	Manhole	Adoptable	SWMH 1.4	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWMH 1.1	303790.379	230671.764	74.060	1.256	1200				
						0	1.1	72.804	300
SWMH 1.2	303794.420	230615.963	74.060	1.472	1200				
						1	2.3	72.588	300
						2	1.1	72.588	300
						0	1.2	72.588	300
SWMH 1.3	303791.945	230611.205	74.070	1.500	1200				
						1	1.2	72.570	300
						0	1.3	72.570	300
SWMH 1.4	303747.389	230607.876	74.080	1.682	1200				
						1	13.1	72.398	225
						2	1.3	72.398	300
						0	1.4	72.398	300
SWMH 1.5	303749.412	230580.792	73.800	1.500	1200				
						1	1.4	72.300	300
						0	1.5	72.300	300
SWMH 2.1	303810.851	230650.189	73.630	0.888	1200				
						0	2.1	72.742	300
SWMH 2.2	303801.029	230633.031	73.830	1.164	1200				
						1	2.1	72.666	300
						0	2.2	72.666	300
SWMH 2.3	303801.612	230619.333	73.880	1.265	1200				
						1	2.2	72.615	300
						0	2.3	72.615	300
SWMH 3.1	303773.730	230584.554	73.800	1.650	1200				
						1	Pond 1	72.150	300
						0	3.1	72.150	300

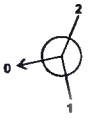
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWMH 3.2	303778.663	230589.105	73.800	1.700	1200		1	3.1	72.100	300
							0	3.2	72.100	300
SWMH 3.3	303800.291	230598.193	74.480	2.500	1200		1	3.2	71.980	300
							0	3.3	71.980	300
SWMH CON	303817.961	230626.100	74.090	2.270	1200		1	3.3	71.820	300
SWMH 4.1	303697.666	230732.518	74.090	0.950	1200		0	4.1	73.140	300
SWMH 4.2	303702.022	230672.672	74.080	1.175	1200		1	4.1	72.905	300
							0	4.2	72.905	300
SWMH 4.3	303706.969	230604.856	74.170	1.532	1200		1	4.2	72.638	300
							0	4.3	72.638	300
SWMH 4.4	303683.675	230603.116	73.770	1.230	1200		1	4.3	72.540	300
							0	4.4	72.540	300
SWMH 4.5	303683.995	230598.861	73.770	1.270	1200		1	6.3	72.528	300
							2	4.4	72.500	300
							0	4.5	72.500	300
SWMH 4.6	303684.630	230590.321	73.690	1.240	1200		1	4.5	72.450	300
							0	4.6	72.450	300
SWMH 4.7	303688.671	230570.937	73.600	1.260	1200		1	5.3	72.424	225
							2	4.6	72.340	300
							0	4.7	72.340	300
SWMH 4.8	303690.454	230563.967	73.600	1.300	1200		1	4.7	72.300	300
							0	4.8	72.300	300
SWMH 5.1	303631.952	230558.259	74.560	1.200	1200		0	5.1	73.360	225
SWMH 5.2	303657.223	230565.296	74.050	1.200	1200		1	5.1	72.850	225
							0	5.2	72.850	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWMH 5.3	303679.571	230571.518	73.600	1.064	1200	1	5.2	72.536	225
						0	5.3	72.536	225
SWMH 6.1	303665.939	230735.265	74.050	0.946	1200	0	6.1	73.104	300
SWMH 6.2	303670.917	230666.328	74.050	1.218	1200	1	6.1	72.832	300
						0	6.2	72.832	300
SWMH 6.3	303675.828	230598.251	73.980	1.416	1200	1	12.1	72.564	225
						2	6.2	72.564	300
						0	6.3	72.564	300
SWMH 7.1	303807.107	230845.748	73.360	1.160	1200	0	7.1	72.200	225
SWMH 7.2	303807.382	230858.280	73.000	1.300	1200	1	7.1	71.700	225
SWMH 8.1	303641.484	230826.729	73.500	1.600	1200	1	Tank 1	71.900	225
						0	8.1	71.900	225
SWMH 8.2	303637.185	230826.204	73.000	1.200	1200	1	8.1	71.800	225
SWMH 9.1	303659.509	230742.509	73.940	1.300	1200	0	9.1	72.640	225
SWMH 9.2	303657.356	230773.390	73.930	1.480	1200	1	9.1	72.450	225
						0	9.2	72.450	225
SWMH 9.3	303656.119	230790.126	73.930	1.580	1200	1	9.2	72.350	225
						0	9.3	72.350	225
SWMH 9.4	303659.893	230790.470	73.900	1.590	1200	1	9.3	72.310	225
						0	9.4	72.310	225
SWMH 9.5	303658.225	230813.431	73.950	1.950	1200	1	9.4	72.000	225
						0	9.5	72.000	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWMH 10.1	303693.616	230782.956	74.090	1.430	1200				
						0	10.1	72.660	225
SWMH 10.2	303688.862	230846.379	74.080	1.840	1200	1	10.1	72.240	225
									
						0	10.2	72.240	225
SWMH 10.3	303665.592	230844.699	73.840	1.740	1200	1	10.2	72.100	225
									
						0	10.3	72.100	225
SWMH 10.4	303660.748	230844.335	73.950	1.950	1200	1	10.3	72.000	225
									
						0	10.4	72.000	300
SWMH 11.1	303834.725	230697.653	73.190	1.190	1200				
						0	11.1	72.000	225
SWMH 11.2	303840.774	230706.535	73.000	1.200	1200	1	11.1	71.800	225
									
SWMH 12.1	303630.983	230594.900	74.280	1.280	1200				
						0	12.1	73.000	225
SWMH 13.1	303717.484	230605.642	74.090	1.470	1200				
						0	13.1	72.620	225
Tank 1	303654.576	230829.617	73.950	1.999	1200	1	9.5	71.951	225
						2	10.4	71.953	300
									
						0	Tank 1	72.000	225
Pond 1	303767.139	230581.821	73.600	1.400	1200	1	1.5	72.200	300
						2	4.8	72.200	300
									
						0	Pond 1	72.200	300
Cat 4			73.710	0.600	1200				
Cat 7			73.770	0.600	1200				
Cat 9			73.710	0.600	1200				

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Cat 15			73.750	0.600	1200				

Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	240
FSR Region	Scotland and Ireland	Additional Storage (m³/ha)	20.0
M5-60 (mm)	16.800	Check Discharge Rate(s)	✓
Ratio-R	0.300	1 year (l/s)	9.0
Summer CV	0.750	30 year (l/s)	20.7
Winter CV	0.840	100 year (l/s)	26.3
Analysis Speed	Normal	Check Discharge Volume	✓
Skip Steady State	x	100 year 1440 minute (m³)	1469

Storm Durations

15 | 60 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	20	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)	5.340	Betterment (%)	0
SAAR (mm)	754	QBar	10.6
Soil Index	3	Q 1 year (l/s)	9.0
SPR	0.30	Q 30 year (l/s)	20.7
Region	11	Q 100 year (l/s)	26.3
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	5.340	Storm Duration (mins)	1440
Soil Index	3	Betterment (%)	0
SPR	0.30	PR	0.333
CWI	113.185	Runoff Volume (m³)	1469

Node Cat 4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	73.110	Product Number	CTL-SHE-0015-1000-0600-1000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.1	Min Node Diameter (mm)	1200

Node Cat 7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	73.170	Product Number	CTL-SHE-0015-1000-0600-1000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.1	Min Node Diameter (mm)	1200

Node Cat 9 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	73.110	Product Number	CTL-SHE-0015-1000-0600-1000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.1	Min Node Diameter (mm)	1200

Node Cat 15 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	73.150	Product Number	CTL-SHE-0015-1000-0600-1000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.1	Min Node Diameter (mm)	1200

Node SWMH 3.2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	72.100	Product Number	CTL-SHE-0123-7900-1500-7900
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	7.9	Min Node Diameter (mm)	1200

Node SWMH 7.1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	0.000	Product Number	CTL-SHE-0022-2000-0600-2000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.2	Min Node Diameter (mm)	1200

Node SWMH 8.1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	71.900	Product Number	CTL-SHE-0065-2200-1400-2200
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.2	Min Node Diameter (mm)	1200

Node SWMH 11.1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	72.000	Product Number	CTL-SHE-0022-2000-0600-2000
Design Depth (m)	0.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.2	Min Node Diameter (mm)	1200

Node Pond 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	72.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.80	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1000.0	0.0	1.600	1564.0	0.0

Node Tank 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	71.951
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	500.0	0.0	1.500	500.0	0.0	1.501	0.0	0.0

Node Cat 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.05000	Invert Level (m)	73.110	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.05000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	120.000	Inf Depth (m)	0.350
Porosity	0.33	Length (m)	25.000		

Node Cat 7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.05000	Invert Level (m)	73.170	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.05000	Time to half empty (mins)	51	Depth (m)	0.350
Safety Factor	2.0	Width (m)	22.000	Inf Depth (m)	0.350
Porosity	0.33	Length (m)	75.000		

Node Cat 9 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.05000	Invert Level (m)	73.110	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.05000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	82.000	Inf Depth (m)	0.350
Porosity	0.33	Length (m)	10.000		

Node Cat 15 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.05000	Invert Level (m)	73.150	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.05000	Time to half empty (mins)	98	Depth (m)	0.350
Safety Factor	2.0	Width (m)	6.200	Inf Depth (m)	0.350
Porosity	0.33	Length (m)	225.000		

Node SWMH 7.1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.05000	Invert Level (m)	72.200	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.05000	Time to half empty (mins)	108	Depth (m)	0.350
Safety Factor	2.0	Width (m)	32.000	Inf Depth (m)	0.350
Porosity	0.33	Length (m)	102.000		

Node SWMH 11.1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.05000	Invert Level (m)	72.000	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.05000	Time to half empty (mins)	75	Depth (m)	0.350
Safety Factor	2.0	Width (m)	46.000	Inf Depth (m)	0.350
Porosity	0.33	Length (m)	50.000		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.680	26.225	30 year 60 minute winter	63.813	25.383
1 year 15 minute winter	65.039	26.225	30 year 1440 minute summer	10.381	2.782
1 year 60 minute summer	44.093	11.652	30 year 1440 minute winter	6.977	2.782
1 year 60 minute winter	29.294	11.652	100 year +20% CC 15 minute summer	320.990	90.829
1 year 1440 minute summer	5.542	1.485	100 year +20% CC 15 minute winter	225.256	90.829
1 year 1440 minute winter	3.724	1.485	100 year +20% CC 60 minute summer	149.687	39.558
30 year 15 minute summer	206.036	58.301	100 year +20% CC 60 minute winter	99.449	39.558
30 year 15 minute winter	144.587	58.301	100 year +20% CC 1440 minute summer	15.421	4.133
30 year 60 minute summer	96.050	25.383	100 year +20% CC 1440 minute winter	10.364	4.133

Results for 1 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 88.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 1.1	11	72.931	0.127	27.0	0.6232	0.0000	OK
15 minute summer	SWMH 1.2	13	72.820	0.232	47.8	0.2622	0.0000	OK
15 minute summer	SWMH 1.3	13	72.808	0.238	46.9	0.2695	0.0000	OK
15 minute summer	SWMH 1.4	13	72.761	0.363	49.8	0.4107	0.0000	SURCHARGED
15 minute summer	SWMH 1.5	12	72.734	0.434	57.9	0.4909	0.0000	SURCHARGED
15 minute summer	SWMH 2.1	10	72.869	0.127	23.5	0.7353	0.0000	OK
15 minute summer	SWMH 2.2	13	72.825	0.159	22.9	0.1794	0.0000	OK
15 minute summer	SWMH 2.3	13	72.823	0.208	22.1	0.2350	0.0000	OK
15 minute summer	SWMH 3.1	37	72.332	0.182	8.2	0.2053	0.0000	OK
15 minute summer	SWMH 3.2	37	72.331	0.231	7.3	0.2618	0.0000	OK
15 minute summer	SWMH 3.3	36	72.041	0.061	6.8	0.0689	0.0000	OK
15 minute summer	SWMH CON	39	71.880	0.060	6.8	0.0000	0.0000	OK
15 minute summer	SWMH 4.1	14	73.674	0.534	73.1	7.8428	0.0000	SURCHARGED
15 minute summer	SWMH 4.2	14	73.645	0.740	64.8	0.8372	0.0000	SURCHARGED
15 minute summer	SWMH 4.3	14	73.617	0.979	73.1	1.1071	0.0000	SURCHARGED
15 minute summer	SWMH 4.4	14	73.605	1.065	30.4	1.2049	0.0000	FLOOD RISK
15 minute summer	SWMH 4.5	14	73.601	1.101	71.5	1.2456	0.0000	FLOOD RISK
15 minute summer	SWMH 4.6	14	73.546	1.096	72.1	1.2396	0.0000	FLOOD RISK
15 minute summer	SWMH 4.7	13	73.462	1.122	82.2	1.2689	0.0000	FLOOD RISK
15 minute summer	SWMH 4.8	13	73.417	1.117	83.2	1.2632	0.0000	FLOOD RISK
15 minute summer	SWMH 5.1	14	73.475	0.115	19.6	0.4600	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 1.1	1.1	SWMH 1.2	26.2	0.712	0.381	2.2624	
15 minute summer	SWMH 1.2	1.2	SWMH 1.3	46.9	0.986	0.732	0.3176	
15 minute summer	SWMH 1.3	1.3	SWMH 1.4	45.9	0.978	0.669	2.9139	
15 minute summer	SWMH 1.4	1.4	SWMH 1.5	57.9	0.909	0.872	1.9125	
15 minute summer	SWMH 1.5	1.5	Pond 1	60.8	2.001	0.731	0.6459	
15 minute summer	SWMH 2.1	2.1	SWMH 2.2	22.9	0.781	0.334	0.6251	
15 minute summer	SWMH 2.2	2.2	SWMH 2.3	22.1	0.628	0.328	0.6160	
15 minute summer	SWMH 2.3	2.3	SWMH 1.2	21.7	0.444	0.336	0.4388	
15 minute summer	SWMH 3.1	3.1	SWMH 3.2	7.3	0.478	0.076	0.3454	
15 minute summer	SWMH 3.2	3.2	SWMH 3.3	6.8	0.673	0.086	0.2388	
15 minute summer	SWMH 3.3	3.3	SWMH CON	6.8	0.677	0.089	0.3333	82.5
15 minute summer	SWMH 4.1	4.1	SWMH 4.2	64.8	1.131	0.937	4.2254	
15 minute summer	SWMH 4.2	4.2	SWMH 4.3	59.6	1.057	0.860	4.7882	
15 minute summer	SWMH 4.3	4.3	SWMH 4.4	30.4	0.673	0.424	1.6449	
15 minute summer	SWMH 4.4	4.4	SWMH 4.5	28.7	0.408	0.267	0.3005	
15 minute summer	SWMH 4.5	4.5	SWMH 4.6	72.1	1.057	0.851	0.6031	
15 minute summer	SWMH 4.6	4.6	SWMH 4.7	73.4	1.042	0.889	1.3944	
15 minute summer	SWMH 4.7	4.7	SWMH 4.8	83.2	1.181	1.007	0.5066	
15 minute summer	SWMH 4.8	4.8	Pond 1	89.1	1.929	2.282	3.8239	
15 minute summer	SWMH 5.1	5.1	SWMH 5.2	19.4	1.445	0.266	0.7880	

Results for 1 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 88.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 5.2	14	73.460	0.610	25.3	0.6894	0.0000	SURCHARGED
15 minute summer	SWMH 5.3	13	73.458	0.922	20.0	1.0428	0.0000	FLOOD RISK
15 minute summer	SWMH 6.1	14	73.788	0.684	104.9	14.1454	0.0000	FLOOD RISK
15 minute summer	SWMH 6.2	14	73.709	0.877	79.5	0.9921	0.0000	SURCHARGED
15 minute summer	SWMH 6.3	14	73.626	1.062	79.6	3.6605	0.0000	SURCHARGED
15 minute summer	SWMH 7.1	20	31.208	-40.992	72.2	0.0000	0.0000	OK
15 minute summer	SWMH 7.2	1	71.700	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SWMH 8.1	46	72.068	0.168	4.9	0.1901	0.0000	OK
15 minute summer	SWMH 8.2	37	71.823	0.023	1.7	0.0000	0.0000	OK
15 minute summer	SWMH 9.1	13	73.552	0.912	83.0	11.2878	0.0000	SURCHARGED
15 minute summer	SWMH 9.2	13	73.209	0.759	50.4	0.8579	0.0000	SURCHARGED
15 minute summer	SWMH 9.3	13	72.999	0.649	50.8	0.7339	0.0000	SURCHARGED
15 minute summer	SWMH 9.4	12	72.923	0.613	51.2	0.6936	0.0000	SURCHARGED
15 minute summer	SWMH 9.5	9	72.668	0.668	52.0	0.7556	0.0000	SURCHARGED
15 minute summer	SWMH 10.1	10	72.816	0.156	35.2	0.8552	0.0000	OK
15 minute summer	SWMH 10.2	11	72.412	0.172	34.6	0.1942	0.0000	OK
15 minute summer	SWMH 10.3	12	72.281	0.181	33.9	0.2042	0.0000	OK
15 minute summer	SWMH 10.4	12	72.167	0.167	33.8	0.1886	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 5.2	5.2	SWMH 5.3	18.8	1.119	0.310	0.9226	
15 minute summer	SWMH 5.3	5.3	SWMH 4.7	-12.8	0.898	-0.221	0.3627	
15 minute summer	SWMH 6.1	6.1	SWMH 6.2	79.5	1.176	1.146	4.8671	
15 minute summer	SWMH 6.2	6.2	SWMH 6.3	52.3	0.966	0.754	4.8064	
15 minute summer	SWMH 6.3	6.3	SWMH 4.5	60.2	0.941	0.821	0.5767	
15 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.0	0.000	0.000	0.0000	0.0
15 minute summer	SWMH 7.1	Infiltration		0.0				
15 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.7	0.785	0.021	0.0093	18.8
15 minute summer	SWMH 9.1	9.1	SWMH 9.2	50.4	1.267	1.241	1.2312	
15 minute summer	SWMH 9.2	9.2	SWMH 9.3	50.8	1.278	1.271	0.6674	
15 minute summer	SWMH 9.3	9.3	SWMH 9.4	51.2	1.288	0.959	0.1507	
15 minute summer	SWMH 9.4	9.4	SWMH 9.5	52.0	1.308	1.131	1.5712	
15 minute summer	SWMH 9.5	9.5	Tank 1	53.6	1.968	1.911	0.4523	
15 minute summer	SWMH 10.1	10.1	SWMH 10.2	34.6	1.135	0.822	1.9661	
15 minute summer	SWMH 10.2	10.2	SWMH 10.3	33.9	1.025	0.843	0.7704	
15 minute summer	SWMH 10.3	10.3	SWMH 10.4	33.8	1.029	0.893	0.6137	
15 minute summer	SWMH 10.4	10.4	Tank 1	33.8	0.928	0.565	0.5813	

Results for 1 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 88.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 11.1	17	72.321	0.321	63.1	23.1408	0.0000	SURCHARGED
15 minute summer	SWMH 11.2	18	71.808	0.008	0.2	0.0000	0.0000	OK
15 minute summer	SWMH 12.1	13	73.628	0.628	31.4	1.5644	0.0000	SURCHARGED
15 minute summer	SWMH 13.1	12	72.781	0.161	9.2	0.1820	0.0000	OK
15 minute summer	Tank 1	27	72.052	0.101	85.5	48.1415	0.0000	OK
15 minute summer	Pond 1	36	72.331	0.131	146.0	107.2983	0.0000	OK
15 minute summer	Cat 4	23	73.178	0.068	16.5	9.8827	0.0000	OK
15 minute summer	Cat 7	23	73.277	0.107	8.1	5.0577	0.0000	OK
15 minute summer	Cat 9	22	73.139	0.029	4.4	1.8290	0.0000	OK
15 minute summer	Cat 15	24	73.318	0.168	7.8	5.0239	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.366	0.002	0.0045	1.1
15 minute summer	SWMH 11.1	Infiltration		6.3				
15 minute summer	SWMH 12.1	12.1	SWMH 6.3	-22.0	-0.574	-0.430	1.7885	
15 minute summer	SWMH 13.1	13.1	SWMH 1.4	-9.2	-0.242	-0.206	1.0516	
15 minute summer	Tank 1	Tank 1	SWMH 8.1	4.9	0.465	0.110	0.2562	
15 minute summer	Pond 1	Pond 1	SWMH 3.1	8.2	0.650	0.088	0.2643	
15 minute summer	Cat 4	Hydro-Brake®		0.1				0.2
15 minute summer	Cat 4	Infiltration		5.7				
15 minute summer	Cat 7	Hydro-Brake®		0.1				0.3
15 minute summer	Cat 7	Infiltration		2.5				
15 minute summer	Cat 9	Hydro-Brake®		0.0				0.1
15 minute summer	Cat 9	Infiltration		2.5				
15 minute summer	Cat 15	Hydro-Brake®		0.1				0.3
15 minute summer	Cat 15	Infiltration		2.3				

Results for 1 year 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 88.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 1.1	11	72.934	0.130	28.4	0.6377	0.0000	OK
15 minute winter	SWMH 1.2	13	72.841	0.253	50.2	0.2860	0.0000	OK
15 minute winter	SWMH 1.3	13	72.821	0.251	48.3	0.2843	0.0000	OK
15 minute winter	SWMH 1.4	12	72.786	0.388	52.5	0.4383	0.0000	SURCHARGED
15 minute winter	SWMH 1.5	12	72.741	0.441	61.3	0.4983	0.0000	SURCHARGED
15 minute winter	SWMH 2.1	10	72.873	0.131	24.7	0.7565	0.0000	OK
15 minute winter	SWMH 2.2	13	72.850	0.184	24.0	0.2079	0.0000	OK
15 minute winter	SWMH 2.3	13	72.846	0.231	23.5	0.2613	0.0000	OK
15 minute winter	SWMH 3.1	39	72.346	0.196	8.7	0.2219	0.0000	OK
15 minute winter	SWMH 3.2	40	72.346	0.246	7.5	0.2782	0.0000	OK
15 minute winter	SWMH 3.3	38	72.042	0.062	7.0	0.0697	0.0000	OK
15 minute winter	SWMH CON	39	71.880	0.060	7.0	0.0000	0.0000	OK
15 minute winter	SWMH 4.1	14	73.811	0.671	76.8	9.8611	0.0000	FLOOD RISK
15 minute winter	SWMH 4.2	15	73.773	0.868	69.0	0.9823	0.0000	SURCHARGED
15 minute winter	SWMH 4.3	15	73.731	1.093	45.9	1.2360	0.0000	SURCHARGED
15 minute winter	SWMH 4.4	15	73.713	1.173	33.3	1.3265	0.0000	FLOOD RISK
15 minute winter	SWMH 4.5	15	73.706	1.206	76.6	1.3644	0.0000	FLOOD RISK
15 minute winter	SWMH 4.6	14	73.634	1.184	77.4	1.3394	0.0000	FLOOD RISK
15 minute winter	SWMH 4.7	14	73.515	1.175	88.4	1.3285	0.0000	FLOOD RISK
15 minute winter	SWMH 4.8	13	73.437	1.137	89.4	1.2864	0.0000	FLOOD RISK
15 minute winter	SWMH 5.1	14	73.540	0.180	20.6	0.7240	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 1.1	1.1	SWMH 1.2	27.3	0.697	0.397	2.4467	
15 minute winter	SWMH 1.2	1.2	SWMH 1.3	48.3	0.966	0.755	0.3390	
15 minute winter	SWMH 1.3	1.3	SWMH 1.4	48.9	0.984	0.712	2.9814	
15 minute winter	SWMH 1.4	1.4	SWMH 1.5	61.3	0.954	0.923	1.9125	
15 minute winter	SWMH 1.5	1.5	Pond 1	65.5	2.061	0.787	0.6411	
15 minute winter	SWMH 2.1	2.1	SWMH 2.2	24.0	0.778	0.350	0.6695	
15 minute winter	SWMH 2.2	2.2	SWMH 2.3	23.5	0.613	0.348	0.7093	
15 minute winter	SWMH 2.3	2.3	SWMH 1.2	22.9	0.451	0.356	0.4828	
15 minute winter	SWMH 3.1	3.1	SWMH 3.2	7.5	0.460	0.079	0.3713	
15 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.0	0.677	0.088	0.2427	
15 minute winter	SWMH 3.3	3.3	SWMH CON	7.0	0.682	0.091	0.3387	87.7
15 minute winter	SWMH 4.1	4.1	SWMH 4.2	69.0	1.116	0.997	4.2254	
15 minute winter	SWMH 4.2	4.2	SWMH 4.3	45.9	1.057	0.663	4.7882	
15 minute winter	SWMH 4.3	4.3	SWMH 4.4	33.3	0.692	0.465	1.6449	
15 minute winter	SWMH 4.4	4.4	SWMH 4.5	29.2	0.415	0.271	0.3005	
15 minute winter	SWMH 4.5	4.5	SWMH 4.6	77.4	1.100	0.914	0.6031	
15 minute winter	SWMH 4.6	4.6	SWMH 4.7	78.2	1.111	0.947	1.3944	
15 minute winter	SWMH 4.7	4.7	SWMH 4.8	89.4	1.270	1.082	0.5066	
15 minute winter	SWMH 4.8	4.8	Pond 1	94.9	2.010	2.431	4.0212	
15 minute winter	SWMH 5.1	5.1	SWMH 5.2	20.9	1.427	0.287	0.9692	

Results for 1 year 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 88.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 5.2	14	73.534	0.684	20.9	0.7741	0.0000	SURCHARGED
15 minute winter	SWMH 5.3	14	73.522	0.986	18.8	1.1147	0.0000	FLOOD RISK
15 minute winter	SWMH 6.1	14	73.937	0.833	110.2	17.2166	0.0000	FLOOD RISK
15 minute winter	SWMH 6.2	15	73.833	1.001	74.0	1.1320	0.0000	FLOOD RISK
15 minute winter	SWMH 6.3	15	73.736	1.172	89.6	4.0395	0.0000	FLOOD RISK
15 minute winter	SWMH 7.1	20	34.981	-37.219	75.9	0.0000	0.0000	OK
15 minute winter	SWMH 7.2	1	71.700	0.000	0.0	0.0000	0.0000	OK
15 minute winter	SWMH 8.1	29	72.081	0.181	5.1	0.2049	0.0000	OK
15 minute winter	SWMH 8.2	25	71.823	0.023	1.7	0.0000	0.0000	OK
15 minute winter	SWMH 9.1	13	73.664	1.024	87.1	12.6715	0.0000	FLOOD RISK
15 minute winter	SWMH 9.2	13	73.276	0.826	53.4	0.9347	0.0000	SURCHARGED
15 minute winter	SWMH 9.3	13	73.044	0.694	53.5	0.7850	0.0000	SURCHARGED
15 minute winter	SWMH 9.4	13	72.956	0.646	53.7	0.7302	0.0000	SURCHARGED
15 minute winter	SWMH 9.5	9	72.684	0.684	54.4	0.7733	0.0000	SURCHARGED
15 minute winter	SWMH 10.1	10	72.822	0.161	37.0	0.8829	0.0000	OK
15 minute winter	SWMH 10.2	11	72.419	0.179	36.2	0.2020	0.0000	OK
15 minute winter	SWMH 10.3	12	72.288	0.188	35.3	0.2122	0.0000	OK
15 minute winter	SWMH 10.4	12	72.171	0.171	35.2	0.1934	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 5.2	5.2	SWMH 5.3	18.0	1.148	0.297	0.9226	
15 minute winter	SWMH 5.3	5.3	SWMH 4.7	13.8	0.981	0.239	0.3627	
15 minute winter	SWMH 6.1	6.1	SWMH 6.2	74.0	1.163	1.067	4.8671	
15 minute winter	SWMH 6.2	6.2	SWMH 6.3	62.2	0.971	0.898	4.8064	
15 minute winter	SWMH 6.3	6.3	SWMH 4.5	52.2	0.945	0.711	0.5767	
15 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.0	0.000	0.000	0.0000	0.0
15 minute winter	SWMH 7.1	Infiltration		0.0				
15 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.7	0.789	0.022	0.0094	22.3
15 minute winter	SWMH 9.1	9.1	SWMH 9.2	53.4	1.343	1.315	1.2312	
15 minute winter	SWMH 9.2	9.2	SWMH 9.3	53.5	1.344	1.336	0.6674	
15 minute winter	SWMH 9.3	9.3	SWMH 9.4	53.7	1.350	1.005	0.1507	
15 minute winter	SWMH 9.4	9.4	SWMH 9.5	54.4	1.368	1.183	1.5712	
15 minute winter	SWMH 9.5	9.5	Tank 1	55.5	1.995	1.981	0.4780	
15 minute winter	SWMH 10.1	10.1	SWMH 10.2	36.2	1.139	0.858	2.0398	
15 minute winter	SWMH 10.2	10.2	SWMH 10.3	35.3	1.030	0.879	0.8000	
15 minute winter	SWMH 10.3	10.3	SWMH 10.4	35.2	1.039	0.930	0.6327	
15 minute winter	SWMH 10.4	10.4	Tank 1	35.2	0.939	0.588	0.5987	

Results for 1 year 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 88.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 11.1	17	72.343	0.343	66.3	26.1742	0.0000	SURCHARGED
15 minute winter	SWMH 11.2	18	71.808	0.008	0.2	0.0000	0.0000	OK
15 minute winter	SWMH 12.1	15	73.736	0.736	23.1	1.8339	0.0000	SURCHARGED
15 minute winter	SWMH 13.1	12	72.818	0.198	11.8	0.2236	0.0000	OK
15 minute winter	Tank 1	27	72.064	0.113	88.6	53.9166	0.0000	OK
15 minute winter	Pond 1	38	72.346	0.146	152.1	120.2727	0.0000	OK
15 minute winter	Cat 4	24	73.182	0.072	18.5	11.2067	0.0000	OK
15 minute winter	Cat 7	24	73.285	0.115	9.1	5.7546	0.0000	OK
15 minute winter	Cat 9	22	73.141	0.031	4.9	2.0805	0.0000	OK
15 minute winter	Cat 15	24	73.330	0.180	8.8	5.7062	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.369	0.002	0.0046	1.2
15 minute winter	SWMH 11.1	Infiltration		6.7				
15 minute winter	SWMH 12.1	12.1	SWMH 6.3	-13.3	0.416	-0.261	1.7885	
15 minute winter	SWMH 13.1	13.1	SWMH 1.4	-11.8	-0.412	-0.265	1.1508	
15 minute winter	Tank 1	Tank 1	SWMH 8.1	5.1	0.492	0.114	0.2918	
15 minute winter	Pond 1	Pond 1	SWMH 3.1	8.7	0.647	0.093	0.2958	
15 minute winter	Cat 4	Hydro-Brake®		0.1				0.2
15 minute winter	Cat 4	Infiltration		6.1				
15 minute winter	Cat 7	Hydro-Brake®		0.1				0.3
15 minute winter	Cat 7	Infiltration		2.7				
15 minute winter	Cat 9	Hydro-Brake®		0.1				0.1
15 minute winter	Cat 9	Infiltration		2.7				
15 minute winter	Cat 15	Hydro-Brake®		0.1				0.3
15 minute winter	Cat 15	Infiltration		2.4				

Results for 1 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 88.15%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 1.1	33	72.912	0.108	19.6	0.5303	0.0000	OK
60 minute summer	SWMH 1.2	34	72.766	0.178	35.7	0.2008	0.0000	OK
60 minute summer	SWMH 1.3	34	72.727	0.157	35.6	0.1778	0.0000	OK
60 minute summer	SWMH 1.4	35	72.560	0.162	35.4	0.1827	0.0000	OK
60 minute summer	SWMH 1.5	35	72.442	0.142	35.3	0.1607	0.0000	OK
60 minute summer	SWMH 2.1	33	72.849	0.107	17.1	0.6174	0.0000	OK
60 minute summer	SWMH 2.2	34	72.785	0.119	17.1	0.1350	0.0000	OK
60 minute summer	SWMH 2.3	34	72.772	0.157	16.7	0.1776	0.0000	OK
60 minute summer	SWMH 3.1	69	72.423	0.273	8.4	0.3090	0.0000	OK
60 minute summer	SWMH 3.2	69	72.423	0.323	7.6	0.3650	0.0000	SURCHARGED
60 minute summer	SWMH 3.3	70	72.044	0.064	7.5	0.0724	0.0000	OK
60 minute summer	SWMH CON	70	71.883	0.063	7.5	0.0000	0.0000	OK
60 minute summer	SWMH 4.1	38	73.487	0.347	53.1	5.0916	0.0000	SURCHARGED
60 minute summer	SWMH 4.2	38	73.444	0.539	54.3	0.6100	0.0000	SURCHARGED
60 minute summer	SWMH 4.3	38	73.397	0.759	40.5	0.8581	0.0000	SURCHARGED
60 minute summer	SWMH 4.4	38	73.378	0.838	35.2	0.9475	0.0000	SURCHARGED
60 minute summer	SWMH 4.5	38	73.371	0.871	83.4	0.9853	0.0000	SURCHARGED
60 minute summer	SWMH 4.6	38	73.290	0.840	82.3	0.9504	0.0000	SURCHARGED
60 minute summer	SWMH 4.7	38	73.148	0.808	88.9	0.9134	0.0000	SURCHARGED
60 minute summer	SWMH 4.8	38	73.060	0.760	88.5	0.8593	0.0000	SURCHARGED
60 minute summer	SWMH 5.1	32	73.428	0.068	14.3	0.2729	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 1.1	1.1	SWMH 1.2	19.4	0.608	0.283	1.8421	
60 minute summer	SWMH 1.2	1.2	SWMH 1.3	35.6	0.880	0.555	0.2167	
60 minute summer	SWMH 1.3	1.3	SWMH 1.4	35.4	0.940	0.516	1.6928	
60 minute summer	SWMH 1.4	1.4	SWMH 1.5	35.3	0.988	0.532	0.9711	
60 minute summer	SWMH 1.5	1.5	Pond 1	35.2	1.522	0.423	0.7435	
60 minute summer	SWMH 2.1	2.1	SWMH 2.2	17.1	0.723	0.249	0.4745	
60 minute summer	SWMH 2.2	2.2	SWMH 2.3	16.7	0.561	0.248	0.4348	
60 minute summer	SWMH 2.3	2.3	SWMH 1.2	16.7	0.414	0.259	0.3206	
60 minute summer	SWMH 3.1	3.1	SWMH 3.2	7.6	0.322	0.079	0.4623	
60 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.5	0.690	0.095	0.2560	
60 minute summer	SWMH 3.3	3.3	SWMH CON	7.5	0.696	0.098	0.3572	115.3
60 minute summer	SWMH 4.1	4.1	SWMH 4.2	54.3	1.060	0.784	4.2254	
60 minute summer	SWMH 4.2	4.2	SWMH 4.3	40.5	0.947	0.584	4.7882	
60 minute summer	SWMH 4.3	4.3	SWMH 4.4	35.2	0.641	0.492	1.6449	
60 minute summer	SWMH 4.4	4.4	SWMH 4.5	33.0	0.468	0.306	0.3005	
60 minute summer	SWMH 4.5	4.5	SWMH 4.6	82.3	1.169	0.972	0.6031	
60 minute summer	SWMH 4.6	4.6	SWMH 4.7	81.3	1.155	0.984	1.3944	
60 minute summer	SWMH 4.7	4.7	SWMH 4.8	88.5	1.257	1.071	0.5066	
60 minute summer	SWMH 4.8	4.8	Pond 1	88.8	1.626	2.273	4.8127	
60 minute summer	SWMH 5.1	5.1	SWMH 5.2	14.5	1.330	0.199	0.6401	

Results for 1 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 88.15%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 5.2	38	73.156	0.306	14.5	0.3466	0.0000	SURCHARGED
60 minute summer	SWMH 5.3	38	73.151	0.615	13.8	0.6951	0.0000	SURCHARGED
60 minute summer	SWMH 6.1	38	73.633	0.529	76.2	10.9335	0.0000	SURCHARGED
60 minute summer	SWMH 6.2	38	73.519	0.687	70.1	0.7769	0.0000	SURCHARGED
60 minute summer	SWMH 6.3	38	73.405	0.841	68.4	2.9002	0.0000	SURCHARGED
60 minute summer	SWMH 7.1	66	55.568	-16.632	52.4	0.0000	0.0000	OK
60 minute summer	SWMH 7.2	1	71.700	0.000	0.0	0.0000	0.0000	OK
60 minute summer	SWMH 8.1	63	72.138	0.238	6.0	0.2689	0.0000	SURCHARGED
60 minute summer	SWMH 8.2	65	71.823	0.023	1.8	0.0000	0.0000	OK
60 minute summer	SWMH 9.1	36	73.154	0.514	60.3	6.3590	0.0000	SURCHARGED
60 minute summer	SWMH 9.2	36	72.865	0.415	47.2	0.4698	0.0000	SURCHARGED
60 minute summer	SWMH 9.3	36	72.693	0.343	46.3	0.3881	0.0000	SURCHARGED
60 minute summer	SWMH 9.4	36	72.628	0.318	46.0	0.3597	0.0000	SURCHARGED
60 minute summer	SWMH 9.5	37	72.271	0.271	45.9	0.3065	0.0000	SURCHARGED
60 minute summer	SWMH 10.1	33	72.787	0.127	25.6	0.6962	0.0000	OK
60 minute summer	SWMH 10.2	34	72.377	0.137	25.5	0.1548	0.0000	OK
60 minute summer	SWMH 10.3	34	72.244	0.144	25.3	0.1630	0.0000	OK
60 minute summer	SWMH 10.4	34	72.140	0.140	25.3	0.1587	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 5.2	5.2	SWMH 5.3	13.8	0.991	0.228	0.9226	
60 minute summer	SWMH 5.3	5.3	SWMH 4.7	9.9	0.626	0.172	0.3627	
60 minute summer	SWMH 6.1	6.1	SWMH 6.2	70.1	1.128	1.010	4.8671	
60 minute summer	SWMH 6.2	6.2	SWMH 6.3	49.1	0.852	0.709	4.8064	
60 minute summer	SWMH 6.3	6.3	SWMH 4.5	55.6	0.826	0.758	0.5767	
60 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.0	0.000	0.000	0.0000	0.0
60 minute summer	SWMH 7.1	Infiltration		0.0				
60 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.8	0.798	0.023	0.0097	27.9
60 minute summer	SWMH 9.1	9.1	SWMH 9.2	47.2	1.188	1.163	1.2312	
60 minute summer	SWMH 9.2	9.2	SWMH 9.3	46.3	1.164	1.157	0.6674	
60 minute summer	SWMH 9.3	9.3	SWMH 9.4	46.0	1.221	0.861	0.1507	
60 minute summer	SWMH 9.4	9.4	SWMH 9.5	45.9	1.154	0.998	1.5712	
60 minute summer	SWMH 9.5	9.5	Tank 1	45.9	1.606	1.637	0.5439	
60 minute summer	SWMH 10.1	10.1	SWMH 10.2	25.5	1.058	0.606	1.5335	
60 minute summer	SWMH 10.2	10.2	SWMH 10.3	25.3	0.973	0.631	0.6083	
60 minute summer	SWMH 10.3	10.3	SWMH 10.4	25.3	0.956	0.667	0.4940	
60 minute summer	SWMH 10.4	10.4	Tank 1	25.2	0.854	0.420	0.5672	

Results for 1 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 88.15%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 11.1	47	72.386	0.386	45.8	32.5005	0.0000	SURCHARGED
60 minute summer	SWMH 11.2	47	71.808	0.008	0.2	0.0000	0.0000	OK
60 minute summer	SWMH 12.1	38	73.408	0.408	16.1	1.0161	0.0000	SURCHARGED
60 minute summer	SWMH 13.1	1	72.620	0.000	0.0	0.0000	0.0000	OK
60 minute summer	Tank 1	68	72.128	0.177	70.2	84.0403	0.0000	OK
60 minute summer	Pond 1	69	72.424	0.224	120.2	186.2111	0.0000	OK
60 minute summer	Cat 4	49	73.190	0.080	17.8	13.5662	0.0000	OK
60 minute summer	Cat 7	50	73.298	0.128	8.7	7.0610	0.0000	OK
60 minute summer	Cat 9	46	73.143	0.033	4.7	2.3008	0.0000	OK
60 minute summer	Cat 15	50	73.352	0.202	8.4	7.0655	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.374	0.002	0.0048	1.6
60 minute summer	SWMH 11.1	Infiltration		7.6				
60 minute summer	SWMH 12.1	12.1	SWMH 6.3	-8.9	0.306	-0.174	1.7885	
60 minute summer	SWMH 13.1	13.1	SWMH 1.4	0.0	0.000	0.000	0.4576	
60 minute summer	Tank 1	Tank 1	SWMH 8.1	6.0	0.453	0.134	0.4218	
60 minute summer	Pond 1	Pond 1	SWMH 3.1	8.4	0.548	0.090	0.4412	
60 minute summer	Cat 4	Hydro-Brake®		0.1				0.3
60 minute summer	Cat 4	Infiltration		6.7				
60 minute summer	Cat 7	Hydro-Brake®		0.1				0.4
60 minute summer	Cat 7	Infiltration		3.0				
60 minute summer	Cat 9	Hydro-Brake®		0.1				0.1
60 minute summer	Cat 9	Infiltration		2.8				
60 minute summer	Cat 15	Hydro-Brake®		0.1				0.5
60 minute summer	Cat 15	Infiltration		2.8				

Results for 1 year 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 88.06%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 1.1	33	72.901	0.097	15.9	0.4763	0.0000	OK
60 minute winter	SWMH 1.2	34	72.746	0.158	29.4	0.1782	0.0000	OK
60 minute winter	SWMH 1.3	34	72.710	0.140	29.3	0.1582	0.0000	OK
60 minute winter	SWMH 1.4	35	72.542	0.144	29.3	0.1629	0.0000	OK
60 minute winter	SWMH 1.5	67	72.451	0.151	29.2	0.1704	0.0000	OK
60 minute winter	SWMH 2.1	33	72.837	0.095	13.8	0.5482	0.0000	OK
60 minute winter	SWMH 2.2	34	72.768	0.102	13.8	0.1153	0.0000	OK
60 minute winter	SWMH 2.3	34	72.752	0.137	13.7	0.1545	0.0000	OK
60 minute winter	SWMH 3.1	68	72.450	0.300	8.6	0.3393	0.0000	SURCHARGED
60 minute winter	SWMH 3.2	68	72.449	0.349	7.7	0.3952	0.0000	SURCHARGED
60 minute winter	SWMH 3.3	69	72.045	0.065	7.6	0.0730	0.0000	OK
60 minute winter	SWMH CON	69	71.883	0.063	7.6	0.0000	0.0000	OK
60 minute winter	SWMH 4.1	40	73.493	0.353	43.0	5.1861	0.0000	SURCHARGED
60 minute winter	SWMH 4.2	40	73.448	0.543	42.4	0.6144	0.0000	SURCHARGED
60 minute winter	SWMH 4.3	40	73.398	0.760	32.8	0.8591	0.0000	SURCHARGED
60 minute winter	SWMH 4.4	40	73.377	0.837	31.9	0.9470	0.0000	SURCHARGED
60 minute winter	SWMH 4.5	40	73.370	0.870	81.7	0.9842	0.0000	SURCHARGED
60 minute winter	SWMH 4.6	40	73.288	0.838	81.7	0.9474	0.0000	SURCHARGED
60 minute winter	SWMH 4.7	40	73.142	0.802	89.6	0.9066	0.0000	SURCHARGED
60 minute winter	SWMH 4.8	40	73.052	0.752	89.5	0.8501	0.0000	SURCHARGED
60 minute winter	SWMH 5.1	33	73.420	0.060	11.5	0.2418	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 1.1	1.1	SWMH 1.2	15.8	0.565	0.231	1.5949	
60 minute winter	SWMH 1.2	1.2	SWMH 1.3	29.3	0.842	0.458	0.1868	
60 minute winter	SWMH 1.3	1.3	SWMH 1.4	29.3	0.896	0.427	1.4646	
60 minute winter	SWMH 1.4	1.4	SWMH 1.5	29.2	0.944	0.440	0.8416	
60 minute winter	SWMH 1.5	1.5	Pond 1	29.2	1.380	0.351	0.8723	
60 minute winter	SWMH 2.1	2.1	SWMH 2.2	13.8	0.693	0.201	0.3955	
60 minute winter	SWMH 2.2	2.2	SWMH 2.3	13.7	0.540	0.203	0.3585	
60 minute winter	SWMH 2.3	2.3	SWMH 1.2	13.7	0.399	0.212	0.2727	
60 minute winter	SWMH 3.1	3.1	SWMH 3.2	7.7	0.340	0.080	0.4725	
60 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.6	0.693	0.096	0.2588	
60 minute winter	SWMH 3.3	3.3	SWMH CON	7.6	0.699	0.099	0.3611	118.6
60 minute winter	SWMH 4.1	4.1	SWMH 4.2	42.4	1.003	0.613	4.2254	
60 minute winter	SWMH 4.2	4.2	SWMH 4.3	32.8	0.798	0.474	4.7882	
60 minute winter	SWMH 4.3	4.3	SWMH 4.4	31.9	0.660	0.445	1.6449	
60 minute winter	SWMH 4.4	4.4	SWMH 4.5	31.0	0.440	0.288	0.3005	
60 minute winter	SWMH 4.5	4.5	SWMH 4.6	81.7	1.160	0.964	0.6031	
60 minute winter	SWMH 4.6	4.6	SWMH 4.7	81.7	1.160	0.989	1.3944	
60 minute winter	SWMH 4.7	4.7	SWMH 4.8	89.5	1.271	1.083	0.5066	
60 minute winter	SWMH 4.8	4.8	Pond 1	89.8	1.579	2.300	5.1331	
60 minute winter	SWMH 5.1	5.1	SWMH 5.2	11.5	1.235	0.158	0.6301	

Results for 1 year 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 88.06%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 5.2	40	73.150	0.300	11.5	0.3398	0.0000	SURCHARGED
60 minute winter	SWMH 5.3	40	73.145	0.609	10.5	0.6883	0.0000	SURCHARGED
60 minute winter	SWMH 6.1	39	73.629	0.525	61.6	10.8407	0.0000	SURCHARGED
60 minute winter	SWMH 6.2	40	73.515	0.683	56.2	0.7729	0.0000	SURCHARGED
60 minute winter	SWMH 6.3	40	73.404	0.840	56.7	2.8961	0.0000	SURCHARGED
60 minute winter	SWMH 7.1	65	62.250	-9.950	42.4	0.0000	0.0000	OK
60 minute winter	SWMH 7.2	1	71.700	0.000	0.0	0.0000	0.0000	OK
60 minute winter	SWMH 8.1	66	72.154	0.254	6.0	0.2870	0.0000	SURCHARGED
60 minute winter	SWMH 8.2	62	71.824	0.024	1.8	0.0000	0.0000	OK
60 minute winter	SWMH 9.1	36	72.982	0.342	48.8	4.2354	0.0000	SURCHARGED
60 minute winter	SWMH 9.2	38	72.727	0.277	44.1	0.3135	0.0000	SURCHARGED
60 minute winter	SWMH 9.3	38	72.589	0.239	44.0	0.2698	0.0000	SURCHARGED
60 minute winter	SWMH 9.4	38	72.536	0.226	43.8	0.2560	0.0000	SURCHARGED
60 minute winter	SWMH 9.5	41	72.260	0.260	43.3	0.2944	0.0000	SURCHARGED
60 minute winter	SWMH 10.1	33	72.772	0.112	20.7	0.6103	0.0000	OK
60 minute winter	SWMH 10.2	34	72.360	0.120	20.7	0.1353	0.0000	OK
60 minute winter	SWMH 10.3	34	72.226	0.126	20.6	0.1421	0.0000	OK
60 minute winter	SWMH 10.4	68	72.149	0.149	20.6	0.1684	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 5.2	5.2	SWMH 5.3	10.5	0.715	0.174	0.9226	
60 minute winter	SWMH 5.3	5.3	SWMH 4.7	9.0	0.675	0.156	0.3627	
60 minute winter	SWMH 6.1	6.1	SWMH 6.2	56.2	1.068	0.810	4.8671	
60 minute winter	SWMH 6.2	6.2	SWMH 6.3	46.0	0.697	0.664	4.8064	
60 minute winter	SWMH 6.3	6.3	SWMH 4.5	54.1	0.768	0.737	0.5767	
60 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.0	0.000	0.000	0.0000	0.0
60 minute winter	SWMH 7.1	Infiltration		0.0				
60 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.8	0.800	0.023	0.0098	28.6
60 minute winter	SWMH 9.1	9.1	SWMH 9.2	44.1	1.110	1.087	1.2312	
60 minute winter	SWMH 9.2	9.2	SWMH 9.3	44.0	1.107	1.100	0.6674	
60 minute winter	SWMH 9.3	9.3	SWMH 9.4	43.8	1.213	0.821	0.1507	
60 minute winter	SWMH 9.4	9.4	SWMH 9.5	43.3	1.153	0.942	1.5708	
60 minute winter	SWMH 9.5	9.5	Tank 1	43.1	1.591	1.539	0.5745	
60 minute winter	SWMH 10.1	10.1	SWMH 10.2	20.7	1.008	0.491	1.3044	
60 minute winter	SWMH 10.2	10.2	SWMH 10.3	20.6	0.933	0.514	0.5160	
60 minute winter	SWMH 10.3	10.3	SWMH 10.4	20.6	0.905	0.544	0.4251	
60 minute winter	SWMH 10.4	10.4	Tank 1	20.6	0.807	0.344	0.6675	

Results for 1 year 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 88.06%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 11.1	49	72.412	0.412	37.1	36.8203	0.0000	SURCHARGED
60 minute winter	SWMH 11.2	50	71.808	0.008	0.2	0.0000	0.0000	OK
60 minute winter	SWMH 12.1	40	73.407	0.407	9.8	1.0134	0.0000	SURCHARGED
60 minute winter	SWMH 13.1	1	72.620	0.000	0.0	0.0000	0.0000	OK
60 minute winter	Tank 1	67	72.149	0.198	63.7	94.2872	0.0000	OK
60 minute winter	Pond 1	68	72.450	0.250	115.6	209.5236	0.0000	OK
60 minute winter	Cat 4	51	73.195	0.085	17.5	15.1335	0.0000	OK
60 minute winter	Cat 7	52	73.306	0.136	8.6	7.9152	0.0000	OK
60 minute winter	Cat 9	47	73.144	0.034	4.6	2.4627	0.0000	OK
60 minute winter	Cat 15	52	73.365	0.215	8.3	7.9294	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.377	0.002	0.0048	1.7
60 minute winter	SWMH 11.1	Infiltration		8.1				
60 minute winter	SWMH 12.1	12.1	SWMH 6.3	6.6	0.315	0.128	1.7885	
60 minute winter	SWMH 13.1	13.1	SWMH 1.4	0.0	0.000	0.000	0.4025	
60 minute winter	Tank 1	Tank 1	SWMH 8.1	6.0	0.434	0.133	0.4537	
60 minute winter	Pond 1	Pond 1	SWMH 3.1	8.6	0.566	0.092	0.4753	
60 minute winter	Cat 4	Hydro-Brake®		0.1				0.4
60 minute winter	Cat 4	Infiltration		7.1				
60 minute winter	Cat 7	Hydro-Brake®		0.1				0.4
60 minute winter	Cat 7	Infiltration		3.2				
60 minute winter	Cat 9	Hydro-Brake®		0.1				0.1
60 minute winter	Cat 9	Infiltration		2.9				
60 minute winter	Cat 15	Hydro-Brake®		0.1				0.5
60 minute winter	Cat 15	Infiltration		2.9				

Results for 1 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 94.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 1.1	750	72.844	0.040	2.7	0.1981	0.0000	OK
1440 minute summer	SWMH 1.2	750	72.649	0.061	5.1	0.0685	0.0000	OK
1440 minute summer	SWMH 1.3	750	72.625	0.055	5.1	0.0627	0.0000	OK
1440 minute summer	SWMH 1.4	960	72.534	0.136	5.1	0.1535	0.0000	OK
1440 minute summer	SWMH 1.5	960	72.534	0.234	5.1	0.2643	0.0000	OK
1440 minute summer	SWMH 2.1	750	72.781	0.039	2.4	0.2240	0.0000	OK
1440 minute summer	SWMH 2.2	750	72.705	0.039	2.4	0.0443	0.0000	OK
1440 minute summer	SWMH 2.3	750	72.656	0.041	2.4	0.0459	0.0000	OK
1440 minute summer	SWMH 3.1	960	72.533	0.383	8.0	0.4332	0.0000	SURCHARGED
1440 minute summer	SWMH 3.2	960	72.532	0.432	8.2	0.4890	0.0000	SURCHARGED
1440 minute summer	SWMH 3.3	960	72.045	0.065	7.8	0.0739	0.0000	OK
1440 minute summer	SWMH CON	960	71.884	0.064	7.8	0.0000	0.0000	OK
1440 minute summer	SWMH 4.1	750	73.206	0.066	7.4	0.9737	0.0000	OK
1440 minute summer	SWMH 4.2	750	72.971	0.066	7.4	0.0749	0.0000	OK
1440 minute summer	SWMH 4.3	750	72.704	0.066	7.4	0.0745	0.0000	OK
1440 minute summer	SWMH 4.4	750	72.610	0.070	7.4	0.0793	0.0000	OK
1440 minute summer	SWMH 4.5	750	72.611	0.111	21.0	0.1258	0.0000	OK
1440 minute summer	SWMH 4.6	750	72.555	0.105	21.0	0.1186	0.0000	OK
1440 minute summer	SWMH 4.7	930	72.537	0.197	23.0	0.2225	0.0000	OK
1440 minute summer	SWMH 4.8	930	72.536	0.236	23.0	0.2672	0.0000	OK
1440 minute summer	SWMH 5.1	750	73.386	0.026	2.0	0.1031	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 1.1	1.1	SWMH 1.2	2.7	0.347	0.039	0.4406	
1440 minute summer	SWMH 1.2	1.2	SWMH 1.3	5.1	0.535	0.080	0.0511	
1440 minute summer	SWMH 1.3	1.3	SWMH 1.4	5.1	0.569	0.074	0.7770	
1440 minute summer	SWMH 1.4	1.4	SWMH 1.5	5.1	0.566	0.077	1.2201	
1440 minute summer	SWMH 1.5	1.5	Pond 1	4.9	0.559	0.059	1.1481	
1440 minute summer	SWMH 2.1	2.1	SWMH 2.2	2.4	0.450	0.035	0.1056	
1440 minute summer	SWMH 2.2	2.2	SWMH 2.3	2.4	0.434	0.036	0.0758	
1440 minute summer	SWMH 2.3	2.3	SWMH 1.2	2.4	0.307	0.037	0.0628	
1440 minute summer	SWMH 3.1	3.1	SWMH 3.2	8.2	0.173	0.086	0.4727	
1440 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.8	0.698	0.099	0.2637	
1440 minute summer	SWMH 3.3	3.3	SWMH CON	7.8	0.705	0.102	0.3678	566.2
1440 minute summer	SWMH 4.1	4.1	SWMH 4.2	7.4	0.643	0.107	0.6912	
1440 minute summer	SWMH 4.2	4.2	SWMH 4.3	7.4	0.646	0.107	0.7796	
1440 minute summer	SWMH 4.3	4.3	SWMH 4.4	7.4	0.621	0.103	0.2792	
1440 minute summer	SWMH 4.4	4.4	SWMH 4.5	7.4	0.417	0.069	0.0773	
1440 minute summer	SWMH 4.5	4.5	SWMH 4.6	21.0	0.920	0.248	0.1956	
1440 minute summer	SWMH 4.6	4.6	SWMH 4.7	21.0	0.771	0.254	0.6532	
1440 minute summer	SWMH 4.7	4.7	SWMH 4.8	23.0	0.637	0.278	0.3903	
1440 minute summer	SWMH 4.8	4.8	Pond 1	22.8	0.575	0.585	5.1158	
1440 minute summer	SWMH 5.1	5.1	SWMH 5.2	2.0	0.749	0.028	0.0701	

Results for 1 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 94.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 5.2	750	72.878	0.028	2.0	0.0318	0.0000	OK
1440 minute summer	SWMH 5.3	750	72.565	0.029	2.0	0.0324	0.0000	OK
1440 minute summer	SWMH 6.1	750	73.184	0.080	10.7	1.6506	0.0000	OK
1440 minute summer	SWMH 6.2	750	72.911	0.079	10.7	0.0891	0.0000	OK
1440 minute summer	SWMH 6.3	750	72.658	0.094	13.6	0.3223	0.0000	OK
1440 minute summer	SWMH 7.1	810	72.582	0.382	7.3	14.1752	0.0000	SURCHARGED
1440 minute summer	SWMH 7.2	810	71.707	0.007	0.2	0.0000	0.0000	OK
1440 minute summer	SWMH 8.1	1080	72.319	0.419	4.7	0.4735	0.0000	SURCHARGED
1440 minute summer	SWMH 8.2	780	71.824	0.024	1.8	0.0000	0.0000	OK
1440 minute summer	SWMH 9.1	750	72.710	0.070	8.4	0.8702	0.0000	OK
1440 minute summer	SWMH 9.2	750	72.522	0.072	8.4	0.0819	0.0000	OK
1440 minute summer	SWMH 9.3	750	72.418	0.068	8.4	0.0770	0.0000	OK
1440 minute summer	SWMH 9.4	750	72.375	0.065	8.4	0.0731	0.0000	OK
1440 minute summer	SWMH 9.5	1080	72.319	0.319	8.4	0.3608	0.0000	SURCHARGED
1440 minute summer	SWMH 10.1	750	72.704	0.044	3.6	0.2423	0.0000	OK
1440 minute summer	SWMH 10.2	1080	72.319	0.079	3.6	0.0893	0.0000	OK
1440 minute summer	SWMH 10.3	1080	72.319	0.219	3.6	0.2476	0.0000	OK
1440 minute summer	SWMH 10.4	1080	72.319	0.319	3.5	0.3607	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 5.2	5.2	SWMH 5.3	2.0	0.693	0.033	0.0670	
1440 minute summer	SWMH 5.3	5.3	SWMH 4.7	2.0	0.602	0.035	0.0965	
1440 minute summer	SWMH 6.1	6.1	SWMH 6.2	10.7	0.719	0.154	1.0281	
1440 minute summer	SWMH 6.2	6.2	SWMH 6.3	10.7	0.641	0.154	1.1415	
1440 minute summer	SWMH 6.3	6.3	SWMH 4.5	13.6	0.766	0.185	0.1454	
1440 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.2	0.488	0.002	0.0042	6.2
1440 minute summer	SWMH 7.1	Infiltration		5.3				
1440 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.8	0.802	0.023	0.0098	130.3
1440 minute summer	SWMH 9.1	9.1	SWMH 9.2	8.4	0.778	0.207	0.3342	
1440 minute summer	SWMH 9.2	9.2	SWMH 9.3	8.4	0.795	0.210	0.1773	
1440 minute summer	SWMH 9.3	9.3	SWMH 9.4	8.4	0.860	0.157	0.0370	
1440 minute summer	SWMH 9.4	9.4	SWMH 9.5	8.4	0.543	0.183	0.9501	
1440 minute summer	SWMH 9.5	9.5	Tank 1	8.3	0.560	0.295	0.6599	
1440 minute summer	SWMH 10.1	10.1	SWMH 10.2	3.6	0.644	0.085	0.4422	
1440 minute summer	SWMH 10.2	10.2	SWMH 10.3	3.6	0.581	0.090	0.6050	
1440 minute summer	SWMH 10.3	10.3	SWMH 10.4	3.5	0.337	0.092	0.7398	
1440 minute summer	SWMH 10.4	10.4	Tank 1	3.4	0.259	0.057	1.1239	

Results for 1 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 94.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 11.1	780	72.262	0.262	6.4	15.9173	0.0000	SURCHARGED
1440 minute summer	SWMH 11.2	600	71.808	0.008	0.1	0.0000	0.0000	OK
1440 minute summer	SWMH 12.1	750	73.022	0.022	1.0	0.0543	0.0000	OK
1440 minute summer	SWMH 13.1	30	72.620	0.000	0.0	0.0000	0.0000	OK
1440 minute summer	Tank 1	1080	72.319	0.368	11.7	175.1759	0.0000	SURCHARGED
1440 minute summer	Pond 1	960	72.534	0.334	27.8	283.0243	0.0000	SURCHARGED
1440 minute summer	Cat 4	750	73.149	0.039	3.5	3.4002	0.0000	OK
1440 minute summer	Cat 7	750	73.235	0.065	1.7	2.0244	0.0000	OK
1440 minute summer	Cat 9	750	73.120	0.010	0.9	0.2524	0.0000	OK
1440 minute summer	Cat 15	750	73.260	0.110	1.7	2.3785	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.1	0.359	0.002	0.0043	9.2
1440 minute summer	SWMH 11.1	Infiltration		5.1				
1440 minute summer	SWMH 12.1	12.1	SWMH 6.3	1.0	0.126	0.020	0.3945	
1440 minute summer	SWMH 13.1	13.1	SWMH 1.4	0.0	0.000	0.000	0.3753	
1440 minute summer	Tank 1	Tank 1	SWMH 8.1	4.7	0.270	0.105	0.5332	
1440 minute summer	Pond 1	Pond 1	SWMH 3.1	8.0	0.472	0.086	0.5024	
1440 minute summer	Cat 4	Hydro-Brake®		0.1				1.5
1440 minute summer	Cat 4	Infiltration		3.3				
1440 minute summer	Cat 7	Hydro-Brake®		0.1				2.3
1440 minute summer	Cat 7	Infiltration		1.5				
1440 minute summer	Cat 9	Hydro-Brake®		0.0				0.4
1440 minute summer	Cat 9	Infiltration		0.9				
1440 minute summer	Cat 15	Hydro-Brake®		0.1				3.0
1440 minute summer	Cat 15	Infiltration		1.5				

Results for 1 year 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 95.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 1.1	750	72.840	0.036	2.1	0.1758	0.0000	OK
1440 minute winter	SWMH 1.2	750	72.641	0.053	3.9	0.0598	0.0000	OK
1440 minute winter	SWMH 1.3	750	72.619	0.049	3.9	0.0549	0.0000	OK
1440 minute winter	SWMH 1.4	1020	72.566	0.168	3.9	0.1903	0.0000	OK
1440 minute winter	SWMH 1.5	1020	72.566	0.266	3.9	0.3011	0.0000	OK
1440 minute winter	SWMH 2.1	750	72.776	0.034	1.8	0.1949	0.0000	OK
1440 minute winter	SWMH 2.2	750	72.700	0.034	1.8	0.0387	0.0000	OK
1440 minute winter	SWMH 2.3	750	72.649	0.034	1.8	0.0387	0.0000	OK
1440 minute winter	SWMH 3.1	1020	72.566	0.416	8.0	0.4700	0.0000	SURCHARGED
1440 minute winter	SWMH 3.2	1020	72.565	0.465	8.1	0.5257	0.0000	SURCHARGED
1440 minute winter	SWMH 3.3	1020	72.046	0.066	7.9	0.0741	0.0000	OK
1440 minute winter	SWMH CON	1020	71.884	0.064	7.9	0.0000	0.0000	OK
1440 minute winter	SWMH 4.1	750	73.198	0.058	5.6	0.8472	0.0000	OK
1440 minute winter	SWMH 4.2	750	72.963	0.058	5.6	0.0651	0.0000	OK
1440 minute winter	SWMH 4.3	750	72.696	0.058	5.6	0.0652	0.0000	OK
1440 minute winter	SWMH 4.4	750	72.594	0.054	5.6	0.0610	0.0000	OK
1440 minute winter	SWMH 4.5	720	72.595	0.095	15.8	0.1070	0.0000	OK
1440 minute winter	SWMH 4.6	1020	72.570	0.120	15.8	0.1355	0.0000	OK
1440 minute winter	SWMH 4.7	1020	72.569	0.229	17.3	0.2594	0.0000	OK
1440 minute winter	SWMH 4.8	1020	72.569	0.269	17.2	0.3042	0.0000	OK
1440 minute winter	SWMH 5.1	750	73.382	0.022	1.5	0.0899	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 1.1	1.1	SWMH 1.2	2.1	0.326	0.031	0.3649	
1440 minute winter	SWMH 1.2	1.2	SWMH 1.3	3.9	0.497	0.061	0.0421	
1440 minute winter	SWMH 1.3	1.3	SWMH 1.4	3.9	0.527	0.057	0.9932	
1440 minute winter	SWMH 1.4	1.4	SWMH 1.5	3.9	0.520	0.059	1.4498	
1440 minute winter	SWMH 1.5	1.5	Pond 1	3.8	0.547	0.046	1.2120	
1440 minute winter	SWMH 2.1	2.1	SWMH 2.2	1.8	0.413	0.026	0.0862	
1440 minute winter	SWMH 2.2	2.2	SWMH 2.3	1.8	0.407	0.027	0.0606	
1440 minute winter	SWMH 2.3	2.3	SWMH 1.2	1.8	0.286	0.028	0.0506	
1440 minute winter	SWMH 3.1	3.1	SWMH 3.2	8.1	0.174	0.084	0.4727	
1440 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.099	0.2645	
1440 minute winter	SWMH 3.3	3.3	SWMH CON	7.9	0.705	0.102	0.3688	599.4
1440 minute winter	SWMH 4.1	4.1	SWMH 4.2	5.6	0.593	0.081	0.5663	
1440 minute winter	SWMH 4.2	4.2	SWMH 4.3	5.6	0.594	0.081	0.6414	
1440 minute winter	SWMH 4.3	4.3	SWMH 4.4	5.6	0.621	0.078	0.2106	
1440 minute winter	SWMH 4.4	4.4	SWMH 4.5	5.6	0.414	0.052	0.0589	
1440 minute winter	SWMH 4.5	4.5	SWMH 4.6	15.8	0.874	0.187	0.1663	
1440 minute winter	SWMH 4.6	4.6	SWMH 4.7	15.8	0.738	0.191	0.8319	
1440 minute winter	SWMH 4.7	4.7	SWMH 4.8	17.2	0.608	0.209	0.4474	
1440 minute winter	SWMH 4.8	4.8	Pond 1	17.1	0.585	0.438	5.3941	
1440 minute winter	SWMH 5.1	5.1	SWMH 5.2	1.5	0.687	0.021	0.0573	

Results for 1 year 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 95.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 5.2	750	72.875	0.025	1.5	0.0278	0.0000	OK
1440 minute winter	SWMH 5.3	1020	72.569	0.033	1.5	0.0376	0.0000	OK
1440 minute winter	SWMH 6.1	750	73.173	0.069	8.0	1.4230	0.0000	OK
1440 minute winter	SWMH 6.2	750	72.900	0.068	8.0	0.0770	0.0000	OK
1440 minute winter	SWMH 6.3	750	72.644	0.080	10.2	0.2763	0.0000	OK
1440 minute winter	SWMH 7.1	810	72.551	0.351	5.5	12.3210	0.0000	SURCHARGED
1440 minute winter	SWMH 7.2	810	71.707	0.007	0.2	0.0000	0.0000	OK
1440 minute winter	SWMH 8.1	1170	72.370	0.470	4.0	0.5315	0.0000	SURCHARGED
1440 minute winter	SWMH 8.2	750	71.824	0.024	1.8	0.0000	0.0000	OK
1440 minute winter	SWMH 9.1	750	72.701	0.061	6.4	0.7542	0.0000	OK
1440 minute winter	SWMH 9.2	750	72.513	0.063	6.4	0.0709	0.0000	OK
1440 minute winter	SWMH 9.3	750	72.409	0.059	6.4	0.0662	0.0000	OK
1440 minute winter	SWMH 9.4	1170	72.370	0.060	6.4	0.0684	0.0000	OK
1440 minute winter	SWMH 9.5	1170	72.370	0.370	6.4	0.4188	0.0000	SURCHARGED
1440 minute winter	SWMH 10.1	750	72.698	0.038	2.7	0.2103	0.0000	OK
1440 minute winter	SWMH 10.2	1170	72.370	0.130	2.7	0.1472	0.0000	OK
1440 minute winter	SWMH 10.3	1170	72.370	0.270	2.7	0.3055	0.0000	SURCHARGED
1440 minute winter	SWMH 10.4	1170	72.370	0.370	2.6	0.4186	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 5.2	5.2	SWMH 5.3	1.5	0.636	0.025	0.0565	
1440 minute winter	SWMH 5.3	5.3	SWMH 4.7	1.5	0.603	0.026	0.1402	
1440 minute winter	SWMH 6.1	6.1	SWMH 6.2	8.0	0.662	0.115	0.8348	
1440 minute winter	SWMH 6.2	6.2	SWMH 6.3	8.0	0.592	0.115	0.9240	
1440 minute winter	SWMH 6.3	6.3	SWMH 4.5	10.2	0.709	0.139	0.1178	
1440 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.2	0.483	0.002	0.0041	6.5
1440 minute winter	SWMH 7.1	Infiltration		4.8				
1440 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.8	0.802	0.023	0.0099	133.9
1440 minute winter	SWMH 9.1	9.1	SWMH 9.2	6.4	0.724	0.158	0.2736	
1440 minute winter	SWMH 9.2	9.2	SWMH 9.3	6.4	0.744	0.160	0.1444	
1440 minute winter	SWMH 9.3	9.3	SWMH 9.4	6.4	0.803	0.120	0.0302	
1440 minute winter	SWMH 9.4	9.4	SWMH 9.5	6.4	0.537	0.139	0.9549	
1440 minute winter	SWMH 9.5	9.5	Tank 1	6.3	0.582	0.226	0.6599	
1440 minute winter	SWMH 10.1	10.1	SWMH 10.2	2.7	0.591	0.064	0.8048	
1440 minute winter	SWMH 10.2	10.2	SWMH 10.3	2.7	0.546	0.067	0.7415	
1440 minute winter	SWMH 10.3	10.3	SWMH 10.4	2.6	0.377	0.069	0.7428	
1440 minute winter	SWMH 10.4	10.4	Tank 1	2.5	0.282	0.043	1.1239	

Results for 1 year 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 95.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 11.1	810	72.222	0.222	4.8	11.7761	0.0000	OK
1440 minute winter	SWMH 11.2	540	71.808	0.008	0.1	0.0000	0.0000	OK
1440 minute winter	SWMH 12.1	750	73.020	0.020	0.8	0.0489	0.0000	OK
1440 minute winter	SWMH 13.1	30	72.620	0.000	0.0	0.0000	0.0000	OK
1440 minute winter	Tank 1	1170	72.370	0.419	8.9	199.5629	0.0000	SURCHARGED
1440 minute winter	Pond 1	1020	72.566	0.366	20.9	312.2939	0.0000	SURCHARGED
1440 minute winter	Cat 4	750	73.140	0.030	2.6	2.1194	0.0000	OK
1440 minute winter	Cat 7	750	73.222	0.052	1.3	1.3639	0.0000	OK
1440 minute winter	Cat 9	780	73.118	0.008	0.7	0.1599	0.0000	OK
1440 minute winter	Cat 15	780	73.235	0.085	1.2	1.5347	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.1	0.359	0.002	0.0043	10.0
1440 minute winter	SWMH 11.1	Infiltration		4.4				
1440 minute winter	SWMH 12.1	12.1	SWMH 6.3	0.8	0.123	0.016	0.3225	
1440 minute winter	SWMH 13.1	13.1	SWMH 1.4	0.0	0.000	0.000	0.4777	
1440 minute winter	Tank 1	Tank 1	SWMH 8.1	4.0	0.226	0.089	0.5332	
1440 minute winter	Pond 1	Pond 1	SWMH 3.1	8.0	0.454	0.086	0.5024	
1440 minute winter	Cat 4	Hydro-Brake®		0.0				1.8
1440 minute winter	Cat 4	Infiltration		2.5				
1440 minute winter	Cat 7	Hydro-Brake®		0.1				2.6
1440 minute winter	Cat 7	Infiltration		1.2				
1440 minute winter	Cat 9	Hydro-Brake®		0.0				0.4
1440 minute winter	Cat 9	Infiltration		0.7				
1440 minute winter	Cat 15	Hydro-Brake®		0.1				3.4
1440 minute winter	Cat 15	Infiltration		1.1				

Results for 30 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 88.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 1.1	12	73.469	0.665	60.1	3.2727	0.0000	SURCHARGED
15 minute summer	SWMH 1.2	12	73.364	0.776	83.1	0.8777	0.0000	SURCHARGED
15 minute summer	SWMH 1.3	12	73.304	0.734	81.5	0.8304	0.0000	SURCHARGED
15 minute summer	SWMH 1.4	12	73.040	0.642	85.5	0.7263	0.0000	SURCHARGED
15 minute summer	SWMH 1.5	11	72.907	0.607	87.3	0.6863	0.0000	SURCHARGED
15 minute summer	SWMH 2.1	12	73.434	0.692	52.2	4.0065	0.0000	FLOOD RISK
15 minute summer	SWMH 2.2	12	73.402	0.736	44.4	0.8327	0.0000	SURCHARGED
15 minute summer	SWMH 2.3	12	73.379	0.764	37.6	0.8644	0.0000	SURCHARGED
15 minute summer	SWMH 3.1	39	72.397	0.247	10.3	0.2794	0.0000	OK
15 minute summer	SWMH 3.2	39	72.397	0.297	8.6	0.3356	0.0000	OK
15 minute summer	SWMH 3.3	40	72.043	0.063	7.4	0.0717	0.0000	OK
15 minute summer	SWMH CON	39	71.882	0.062	7.4	0.0000	0.0000	OK
15 minute summer	SWMH 4.1	10	74.090	0.950	162.4	13.9546	20.2261	FLOOD
15 minute summer	SWMH 4.2	10	74.011	1.106	78.8	1.2507	0.0000	FLOOD RISK
15 minute summer	SWMH 4.3	10	73.842	1.204	77.0	1.3621	0.0000	SURCHARGED
15 minute summer	SWMH 4.4	10	73.770	1.230	48.2	1.3911	13.8131	FLOOD
15 minute summer	SWMH 4.5	10	73.770	1.270	115.7	1.4364	4.5022	FLOOD
15 minute summer	SWMH 4.6	10	73.690	1.240	88.8	1.4024	3.4628	FLOOD
15 minute summer	SWMH 4.7	10	73.600	1.260	99.5	1.4251	1.0485	FLOOD
15 minute summer	SWMH 4.8	10	73.588	1.288	100.0	1.4571	0.0000	FLOOD RISK
15 minute summer	SWMH 5.1	12	73.910	0.550	43.7	2.2079	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 1.1	1.1	SWMH 1.2	51.4	0.849	0.748	3.9397	
15 minute summer	SWMH 1.2	1.2	SWMH 1.3	81.5	1.158	1.274	0.3777	
15 minute summer	SWMH 1.3	1.3	SWMH 1.4	83.3	1.182	1.213	3.1463	
15 minute summer	SWMH 1.4	1.4	SWMH 1.5	87.3	1.240	1.315	1.9125	
15 minute summer	SWMH 1.5	1.5	Pond 1	91.5	2.179	1.100	0.6957	
15 minute summer	SWMH 2.1	2.1	SWMH 2.2	44.4	0.860	0.647	1.3922	
15 minute summer	SWMH 2.2	2.2	SWMH 2.3	37.6	0.642	0.558	0.9654	
15 minute summer	SWMH 2.3	2.3	SWMH 1.2	40.7	0.578	0.632	0.5593	
15 minute summer	SWMH 3.1	3.1	SWMH 3.2	8.6	0.499	0.090	0.4442	
15 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.4	0.686	0.093	0.2524	
15 minute summer	SWMH 3.3	3.3	SWMH CON	7.4	0.692	0.096	0.3522	99.9
15 minute summer	SWMH 4.1	4.1	SWMH 4.2	78.8	1.162	1.139	4.2254	
15 minute summer	SWMH 4.2	4.2	SWMH 4.3	62.5	1.045	0.902	4.7882	
15 minute summer	SWMH 4.3	4.3	SWMH 4.4	48.2	0.693	0.673	1.6449	
15 minute summer	SWMH 4.4	4.4	SWMH 4.5	40.2	0.571	0.374	0.3005	
15 minute summer	SWMH 4.5	4.5	SWMH 4.6	88.8	1.262	1.049	0.6031	
15 minute summer	SWMH 4.6	4.6	SWMH 4.7	89.1	1.265	1.079	1.3944	
15 minute summer	SWMH 4.7	4.7	SWMH 4.8	100.0	1.420	1.210	0.5066	
15 minute summer	SWMH 4.8	4.8	Pond 1	103.0	2.084	2.638	4.6113	
15 minute summer	SWMH 5.1	5.1	SWMH 5.2	37.3	1.588	0.514	1.0433	

Results for 30 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 88.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 5.2	12	73.749	0.899	37.3	1.0166	0.0000	SURCHARGED
15 minute summer	SWMH 5.3	10	73.600	1.064	37.7	1.2034	4.6899	FLOOD
15 minute summer	SWMH 6.1	10	74.050	0.946	233.1	19.5500	37.8019	FLOOD
15 minute summer	SWMH 6.2	10	73.993	1.161	86.1	1.3127	0.0000	FLOOD RISK
15 minute summer	SWMH 6.3	10	73.898	1.334	99.6	4.5992	0.0000	FLOOD RISK
15 minute summer	SWMH 7.1	21	69.364	-2.836	160.4	0.0000	0.0000	OK
15 minute summer	SWMH 7.2	1	71.700	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SWMH 8.1	28	72.142	0.242	7.0	0.2731	0.0000	SURCHARGED
15 minute summer	SWMH 8.2	30	71.823	0.023	1.8	0.0000	0.0000	OK
15 minute summer	SWMH 9.1	10	73.940	1.300	184.4	16.0901	21.9633	FLOOD
15 minute summer	SWMH 9.2	10	73.520	1.070	59.9	1.2103	0.0000	SURCHARGED
15 minute summer	SWMH 9.3	10	73.271	0.921	59.6	1.0415	0.0000	SURCHARGED
15 minute summer	SWMH 9.4	10	73.177	0.867	59.8	0.9803	0.0000	SURCHARGED
15 minute summer	SWMH 9.5	8	72.710	0.710	60.1	0.8027	0.0000	SURCHARGED
15 minute summer	SWMH 10.1	12	73.760	1.100	78.2	6.0126	0.0000	SURCHARGED
15 minute summer	SWMH 10.2	12	72.868	0.628	58.3	0.7099	0.0000	SURCHARGED
15 minute summer	SWMH 10.3	13	72.519	0.419	57.5	0.4737	0.0000	SURCHARGED
15 minute summer	SWMH 10.4	13	72.234	0.234	57.4	0.2646	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 5.2	5.2	SWMH 5.3	37.7	1.239	0.622	0.9226	
15 minute summer	SWMH 5.3	5.3	SWMH 4.7	22.9	1.031	0.397	0.3627	
15 minute summer	SWMH 6.1	6.1	SWMH 6.2	86.1	1.223	1.241	4.8671	
15 minute summer	SWMH 6.2	6.2	SWMH 6.3	56.1	0.963	0.809	4.8064	
15 minute summer	SWMH 6.3	6.3	SWMH 4.5	99.9	1.418	1.361	0.5767	
15 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.0	0.000	0.000	0.0000	0.0
15 minute summer	SWMH 7.1	Infiltration		0.0				
15 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.8	0.799	0.023	0.0098	25.3
15 minute summer	SWMH 9.1	9.1	SWMH 9.2	59.9	1.507	1.475	1.2312	
15 minute summer	SWMH 9.2	9.2	SWMH 9.3	59.6	1.498	1.489	0.6674	
15 minute summer	SWMH 9.3	9.3	SWMH 9.4	59.8	1.505	1.120	0.1507	
15 minute summer	SWMH 9.4	9.4	SWMH 9.5	60.1	1.512	1.307	1.5712	
15 minute summer	SWMH 9.5	9.5	Tank 1	61.0	2.215	2.177	0.5903	
15 minute summer	SWMH 10.1	10.1	SWMH 10.2	58.3	1.465	1.382	2.5295	
15 minute summer	SWMH 10.2	10.2	SWMH 10.3	57.5	1.446	1.432	0.9279	
15 minute summer	SWMH 10.3	10.3	SWMH 10.4	57.4	1.444	1.516	0.7428	
15 minute summer	SWMH 10.4	10.4	Tank 1	57.6	1.092	0.962	0.8384	

Results for 30 year 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 88.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 11.1	18	72.504	0.504	140.2	53.8950	0.0000	SURCHARGED
15 minute summer	SWMH 11.2	18	71.809	0.009	0.2	0.0000	0.0000	OK
15 minute summer	SWMH 12.1	10	73.982	0.982	45.9	2.4457	0.0000	FLOOD RISK
15 minute summer	SWMH 13.1	10	73.076	0.456	6.0	0.5157	0.0000	SURCHARGED
15 minute summer	Tank 1	29	72.126	0.175	118.5	83.3373	0.0000	OK
15 minute summer	Pond 1	39	72.397	0.197	189.2	163.4086	0.0000	OK
15 minute summer	Cat 4	24	73.219	0.109	36.7	24.7296	0.0000	OK
15 minute summer	Cat 7	24	73.343	0.173	18.0	12.4712	0.0000	OK
15 minute summer	Cat 9	23	73.159	0.049	9.7	5.1015	0.0000	OK
15 minute summer	Cat 15	24	73.422	0.272	17.4	12.2535	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.386	0.003	0.0051	1.7
15 minute summer	SWMH 11.1	Infiltration		9.9				
15 minute summer	SWMH 12.1	12.1	SWMH 6.3	-25.0	-0.630	-0.490	1.7885	
15 minute summer	SWMH 13.1	13.1	SWMH 1.4	6.5	-0.249	0.146	1.1927	
15 minute summer	Tank 1	Tank 1	SWMH 8.1	7.0	0.548	0.157	0.4199	
15 minute summer	Pond 1	Pond 1	SWMH 3.1	10.3	0.702	0.111	0.3965	
15 minute summer	Cat 4	Hydro-Brake®		0.1				0.3
15 minute summer	Cat 4	Infiltration		9.2				
15 minute summer	Cat 7	Hydro-Brake®		0.1				0.4
15 minute summer	Cat 7	Infiltration		4.0				
15 minute summer	Cat 9	Hydro-Brake®		0.1				0.1
15 minute summer	Cat 9	Infiltration		4.2				
15 minute summer	Cat 15	Hydro-Brake®		0.1				0.5
15 minute summer	Cat 15	Infiltration		3.7				

Results for 30 year 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 89.07%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 1.1	12	73.569	0.765	63.0	3.7656	0.0000	SURCHARGED
15 minute winter	SWMH 1.2	12	73.455	0.867	86.6	0.9803	0.0000	SURCHARGED
15 minute winter	SWMH 1.3	12	73.385	0.815	88.1	0.9221	0.0000	SURCHARGED
15 minute winter	SWMH 1.4	11	73.075	0.677	91.1	0.7652	0.0000	SURCHARGED
15 minute winter	SWMH 1.5	10	73.001	0.701	92.8	0.7923	0.0000	SURCHARGED
15 minute winter	SWMH 2.1	12	73.531	0.789	54.9	4.5719	0.0000	FLOOD RISK
15 minute winter	SWMH 2.2	12	73.498	0.832	43.9	0.9409	0.0000	SURCHARGED
15 minute winter	SWMH 2.3	12	73.473	0.858	40.5	0.9700	0.0000	SURCHARGED
15 minute winter	SWMH 3.1	37	72.407	0.257	9.6	0.2904	0.0000	OK
15 minute winter	SWMH 3.2	37	72.406	0.306	8.6	0.3466	0.0000	SURCHARGED
15 minute winter	SWMH 3.3	39	72.044	0.064	7.4	0.0720	0.0000	OK
15 minute winter	SWMH CON	40	71.882	0.062	7.4	0.0000	0.0000	OK
15 minute winter	SWMH 4.1	10	74.090	0.950	170.7	13.9546	23.7205	FLOOD
15 minute winter	SWMH 4.2	13	73.965	1.060	73.1	1.1992	0.0000	FLOOD RISK
15 minute winter	SWMH 4.3	14	73.826	1.188	50.1	1.3431	0.0000	SURCHARGED
15 minute winter	SWMH 4.4	10	73.770	1.230	47.6	1.3911	15.7274	FLOOD
15 minute winter	SWMH 4.5	10	73.770	1.270	112.4	1.4364	4.5501	FLOOD
15 minute winter	SWMH 4.6	10	73.690	1.240	89.2	1.4024	3.4280	FLOOD
15 minute winter	SWMH 4.7	10	73.600	1.260	100.3	1.4251	1.5568	FLOOD
15 minute winter	SWMH 4.8	10	73.564	1.264	100.8	1.4293	0.0000	FLOOD RISK
15 minute winter	SWMH 5.1	11	73.963	0.603	45.9	2.4212	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 1.1	1.1	SWMH 1.2	48.2	0.819	0.702	3.9397	
15 minute winter	SWMH 1.2	1.2	SWMH 1.3	88.1	1.251	1.377	0.3777	
15 minute winter	SWMH 1.3	1.3	SWMH 1.4	89.7	1.274	1.307	3.1463	
15 minute winter	SWMH 1.4	1.4	SWMH 1.5	92.8	1.318	1.397	1.9125	
15 minute winter	SWMH 1.5	1.5	Pond 1	96.8	2.139	1.165	0.7258	
15 minute winter	SWMH 2.1	2.1	SWMH 2.2	43.9	0.830	0.641	1.3922	
15 minute winter	SWMH 2.2	2.2	SWMH 2.3	40.5	0.641	0.600	0.9654	
15 minute winter	SWMH 2.3	2.3	SWMH 1.2	43.3	0.615	0.672	0.5593	
15 minute winter	SWMH 3.1	3.1	SWMH 3.2	8.6	0.493	0.090	0.4518	
15 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.4	0.688	0.094	0.2538	
15 minute winter	SWMH 3.3	3.3	SWMH CON	7.4	0.694	0.097	0.3542	101.4
15 minute winter	SWMH 4.1	4.1	SWMH 4.2	73.1	1.152	1.056	4.2254	
15 minute winter	SWMH 4.2	4.2	SWMH 4.3	50.1	1.099	0.723	4.7882	
15 minute winter	SWMH 4.3	4.3	SWMH 4.4	47.6	0.676	0.665	1.6449	
15 minute winter	SWMH 4.4	4.4	SWMH 4.5	37.0	0.526	0.344	0.3005	
15 minute winter	SWMH 4.5	4.5	SWMH 4.6	89.2	1.266	1.053	0.6031	
15 minute winter	SWMH 4.6	4.6	SWMH 4.7	90.1	1.280	1.091	1.3944	
15 minute winter	SWMH 4.7	4.7	SWMH 4.8	100.8	1.432	1.220	0.5066	
15 minute winter	SWMH 4.8	4.8	Pond 1	104.2	2.081	2.667	4.7227	
15 minute winter	SWMH 5.1	5.1	SWMH 5.2	40.0	1.507	0.551	1.0433	

Results for 30 year 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 89.07%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 5.2	11	73.770	0.920	40.0	1.0410	0.0000	FLOOD RISK
15 minute winter	SWMH 5.3	10	73.600	1.064	40.1	1.2034	5.9899	FLOOD
15 minute winter	SWMH 6.1	9	74.050	0.946	244.9	19.5500	54.5102	FLOOD
15 minute winter	SWMH 6.2	11	73.968	1.136	81.2	1.2852	0.0000	FLOOD RISK
15 minute winter	SWMH 6.3	10	73.900	1.336	103.5	4.6038	0.0000	FLOOD RISK
15 minute winter	SWMH 7.1	19	72.403	0.203	168.6	5.1793	0.0000	OK
15 minute winter	SWMH 7.2	45	71.706	0.006	0.1	0.0000	0.0000	OK
15 minute winter	SWMH 8.1	26	72.152	0.252	6.4	0.2851	0.0000	SURCHARGED
15 minute winter	SWMH 8.2	28	71.823	0.023	1.8	0.0000	0.0000	OK
15 minute winter	SWMH 9.1	9	73.940	1.300	193.7	16.0901	33.2523	FLOOD
15 minute winter	SWMH 9.2	10	73.527	1.077	59.8	1.2186	0.0000	SURCHARGED
15 minute winter	SWMH 9.3	10	73.279	0.928	60.0	1.0501	0.0000	SURCHARGED
15 minute winter	SWMH 9.4	10	73.182	0.872	60.2	0.9865	0.0000	SURCHARGED
15 minute winter	SWMH 9.5	7	72.750	0.750	60.3	0.8478	0.0000	SURCHARGED
15 minute winter	SWMH 10.1	12	73.892	1.232	82.1	6.7378	0.0000	FLOOD RISK
15 minute winter	SWMH 10.2	13	72.934	0.694	60.6	0.7849	0.0000	SURCHARGED
15 minute winter	SWMH 10.3	13	72.555	0.455	59.8	0.5148	0.0000	SURCHARGED
15 minute winter	SWMH 10.4	13	72.241	0.241	59.9	0.2725	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 5.2	5.2	SWMH 5.3	40.1	1.184	0.663	0.9226	
15 minute winter	SWMH 5.3	5.3	SWMH 4.7	24.1	1.090	0.418	0.3627	
15 minute winter	SWMH 6.1	6.1	SWMH 6.2	81.2	1.186	1.170	4.8671	
15 minute winter	SWMH 6.2	6.2	SWMH 6.3	64.5	0.996	0.931	4.8064	
15 minute winter	SWMH 6.3	6.3	SWMH 4.5	102.9	1.461	1.402	0.5767	
15 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.1	0.468	0.001	0.0039	0.5
15 minute winter	SWMH 7.1	Infiltration		2.8				
15 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.8	0.800	0.023	0.0098	25.7
15 minute winter	SWMH 9.1	9.1	SWMH 9.2	59.8	1.504	1.473	1.2312	
15 minute winter	SWMH 9.2	9.2	SWMH 9.3	60.0	1.510	1.500	0.6674	
15 minute winter	SWMH 9.3	9.3	SWMH 9.4	60.2	1.513	1.127	0.1507	
15 minute winter	SWMH 9.4	9.4	SWMH 9.5	60.3	1.516	1.311	1.5712	
15 minute winter	SWMH 9.5	9.5	Tank 1	61.0	2.252	2.178	0.6166	
15 minute winter	SWMH 10.1	10.1	SWMH 10.2	60.6	1.524	1.438	2.5295	
15 minute winter	SWMH 10.2	10.2	SWMH 10.3	59.8	1.503	1.488	0.9279	
15 minute winter	SWMH 10.3	10.3	SWMH 10.4	59.9	1.507	1.582	0.7428	
15 minute winter	SWMH 10.4	10.4	Tank 1	60.0	1.106	1.002	0.8609	

Results for 30 year 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 89.07%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 11.1	18	72.537	0.537	147.4	60.8560	0.0000	SURCHARGED
15 minute winter	SWMH 11.2	18	71.809	0.009	0.2	0.0000	0.0000	OK
15 minute winter	SWMH 12.1	10	74.019	1.019	24.6	2.5369	0.0000	FLOOD RISK
15 minute winter	SWMH 13.1	12	73.066	0.446	20.5	0.5047	0.0000	SURCHARGED
15 minute winter	Tank 1	29	72.139	0.188	120.8	89.6945	0.0000	OK
15 minute winter	Pond 1	39	72.407	0.207	196.2	171.9861	0.0000	OK
15 minute winter	Cat 4	24	73.226	0.116	41.1	27.9576	0.0000	OK
15 minute winter	Cat 7	25	73.354	0.184	20.1	14.0885	0.0000	OK
15 minute winter	Cat 9	23	73.163	0.053	10.9	5.8125	0.0000	OK
15 minute winter	Cat 15	25	73.440	0.290	19.5	13.8196	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.389	0.003	0.0052	1.9
15 minute winter	SWMH 11.1	Infiltration		10.6				
15 minute winter	SWMH 12.1	12.1	SWMH 6.3	23.0	0.577	0.449	1.7885	
15 minute winter	SWMH 13.1	13.1	SWMH 1.4	-20.5	-0.597	-0.459	1.1927	
15 minute winter	Tank 1	Tank 1	SWMH 8.1	6.4	0.531	0.142	0.4397	
15 minute winter	Pond 1	Pond 1	SWMH 3.1	9.6	0.644	0.104	0.4140	
15 minute winter	Cat 4	Hydro-Brake®		0.1				0.4
15 minute winter	Cat 4	Infiltration		9.8				
15 minute winter	Cat 7	Hydro-Brake®		0.1				0.4
15 minute winter	Cat 7	Infiltration		4.3				
15 minute winter	Cat 9	Hydro-Brake®		0.1				0.2
15 minute winter	Cat 9	Infiltration		4.5				
15 minute winter	Cat 15	Hydro-Brake®		0.1				0.5
15 minute winter	Cat 15	Infiltration		4.0				

Results for 30 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 92.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 1.1	33	72.972	0.168	42.7	0.8274	0.0000	OK
60 minute summer	SWMH 1.2	35	72.912	0.324	74.3	0.3667	0.0000	SURCHARGED
60 minute summer	SWMH 1.3	35	72.863	0.293	73.3	0.3311	0.0000	OK
60 minute summer	SWMH 1.4	35	72.674	0.276	72.8	0.3122	0.0000	OK
60 minute summer	SWMH 1.5	74	72.586	0.286	72.0	0.3231	0.0000	OK
60 minute summer	SWMH 2.1	34	72.959	0.217	37.2	1.2578	0.0000	OK
60 minute summer	SWMH 2.2	34	72.941	0.275	34.6	0.3109	0.0000	OK
60 minute summer	SWMH 2.3	35	72.925	0.310	33.4	0.3510	0.0000	SURCHARGED
60 minute summer	SWMH 3.1	74	72.585	0.435	9.2	0.4919	0.0000	SURCHARGED
60 minute summer	SWMH 3.2	74	72.584	0.484	8.8	0.5477	0.0000	SURCHARGED
60 minute summer	SWMH 3.3	75	72.046	0.066	7.9	0.0741	0.0000	OK
60 minute summer	SWMH CON	75	71.884	0.064	7.9	0.0000	0.0000	OK
60 minute summer	SWMH 4.1	32	74.090	0.950	115.7	13.9546	19.8094	FLOOD
60 minute summer	SWMH 4.2	33	73.965	1.060	55.1	1.1994	0.0000	FLOOD RISK
60 minute summer	SWMH 4.3	34	73.826	1.188	47.2	1.3432	0.0000	SURCHARGED
60 minute summer	SWMH 4.4	32	73.770	1.230	47.2	1.3911	18.9113	FLOOD
60 minute summer	SWMH 4.5	32	73.770	1.270	104.4	1.4364	0.5349	FLOOD
60 minute summer	SWMH 4.6	35	73.686	1.236	101.1	1.3981	0.0000	FLOOD RISK
60 minute summer	SWMH 4.7	35	73.538	1.198	114.4	1.3547	0.0000	FLOOD RISK
60 minute summer	SWMH 4.8	35	73.401	1.101	111.9	1.2453	0.0000	FLOOD RISK
60 minute summer	SWMH 5.1	34	73.751	0.391	31.1	1.5681	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 1.1	1.1	SWMH 1.2	42.5	0.727	0.619	3.1063	
60 minute summer	SWMH 1.2	1.2	SWMH 1.3	73.3	1.041	1.146	0.3765	
60 minute summer	SWMH 1.3	1.3	SWMH 1.4	72.8	1.080	1.061	3.0781	
60 minute summer	SWMH 1.4	1.4	SWMH 1.5	72.0	1.161	1.084	1.6676	
60 minute summer	SWMH 1.5	1.5	Pond 1	71.7	1.665	0.863	1.2397	
60 minute summer	SWMH 2.1	2.1	SWMH 2.2	34.6	0.758	0.505	1.2083	
60 minute summer	SWMH 2.2	2.2	SWMH 2.3	33.4	0.567	0.496	0.9463	
60 minute summer	SWMH 2.3	2.3	SWMH 1.2	33.6	0.477	0.522	0.5593	
60 minute summer	SWMH 3.1	3.1	SWMH 3.2	8.8	0.361	0.092	0.4727	
60 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
60 minute summer	SWMH 3.3	3.3	SWMH CON	7.9	0.706	0.102	0.3691	128.1
60 minute summer	SWMH 4.1	4.1	SWMH 4.2	55.1	1.018	0.796	4.2254	
60 minute summer	SWMH 4.2	4.2	SWMH 4.3	47.2	0.770	0.682	4.7882	
60 minute summer	SWMH 4.3	4.3	SWMH 4.4	47.2	0.675	0.659	1.6449	
60 minute summer	SWMH 4.4	4.4	SWMH 4.5	40.7	0.578	0.378	0.3005	
60 minute summer	SWMH 4.5	4.5	SWMH 4.6	101.1	1.436	1.194	0.6031	
60 minute summer	SWMH 4.6	4.6	SWMH 4.7	99.2	1.409	1.201	1.3944	
60 minute summer	SWMH 4.7	4.7	SWMH 4.8	111.9	1.590	1.355	0.5066	
60 minute summer	SWMH 4.8	4.8	Pond 1	112.1	1.883	2.870	5.5445	
60 minute summer	SWMH 5.1	5.1	SWMH 5.2	28.0	1.317	0.386	1.0433	

Results for 30 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 92.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 5.2	35	73.660	0.810	28.0	0.9162	0.0000	SURCHARGED
60 minute summer	SWMH 5.3	35	73.578	1.042	27.9	1.1785	0.0000	FLOOD RISK
60 minute summer	SWMH 6.1	31	74.050	0.946	165.9	19.5500	49.5829	FLOOD
60 minute summer	SWMH 6.2	32	73.953	1.121	56.4	1.2676	0.0000	FLOOD RISK
60 minute summer	SWMH 6.3	32	73.859	1.295	85.6	4.4636	0.0000	FLOOD RISK
60 minute summer	SWMH 7.1	61	72.853	0.653	114.2	35.7834	0.0000	SURCHARGED
60 minute summer	SWMH 7.2	61	71.708	0.008	0.2	0.0000	0.0000	OK
60 minute summer	SWMH 8.1	69	72.302	0.402	4.9	0.4549	0.0000	SURCHARGED
60 minute summer	SWMH 8.2	44	71.824	0.024	1.8	0.0000	0.0000	OK
60 minute summer	SWMH 9.1	32	73.940	1.300	131.3	16.0901	19.2035	FLOOD
60 minute summer	SWMH 9.2	39	73.448	0.998	63.7	1.1291	0.0000	SURCHARGED
60 minute summer	SWMH 9.3	40	73.157	0.807	61.8	0.9127	0.0000	SURCHARGED
60 minute summer	SWMH 9.4	40	73.048	0.738	60.3	0.8352	0.0000	SURCHARGED
60 minute summer	SWMH 9.5	42	72.461	0.461	60.3	0.5213	0.0000	SURCHARGED
60 minute summer	SWMH 10.1	35	73.254	0.594	55.7	3.2459	0.0000	SURCHARGED
60 minute summer	SWMH 10.2	35	72.647	0.407	48.1	0.4607	0.0000	SURCHARGED
60 minute summer	SWMH 10.3	35	72.402	0.302	48.0	0.3413	0.0000	SURCHARGED
60 minute summer	SWMH 10.4	68	72.303	0.303	47.9	0.3422	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 5.2	5.2	SWMH 5.3	27.9	0.810	0.461	0.9226	
60 minute summer	SWMH 5.3	5.3	SWMH 4.7	28.0	0.770	0.486	0.3627	
60 minute summer	SWMH 6.1	6.1	SWMH 6.2	56.4	1.038	0.813	4.8671	
60 minute summer	SWMH 6.2	6.2	SWMH 6.3	49.5	0.753	0.714	4.8064	
60 minute summer	SWMH 6.3	6.3	SWMH 4.5	85.5	1.215	1.166	0.5767	
60 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.2	0.523	0.002	0.0050	1.7
60 minute summer	SWMH 7.1	Infiltration		9.2				
60 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.8	0.802	0.023	0.0099	29.5
60 minute summer	SWMH 9.1	9.1	SWMH 9.2	63.7	1.601	1.568	1.2312	
60 minute summer	SWMH 9.2	9.2	SWMH 9.3	61.8	1.553	1.544	0.6674	
60 minute summer	SWMH 9.3	9.3	SWMH 9.4	60.3	1.517	1.130	0.1507	
60 minute summer	SWMH 9.4	9.4	SWMH 9.5	60.3	1.516	1.311	1.5712	
60 minute summer	SWMH 9.5	9.5	Tank 1	60.3	1.656	2.153	0.6599	
60 minute summer	SWMH 10.1	10.1	SWMH 10.2	48.1	1.209	1.141	2.5295	
60 minute summer	SWMH 10.2	10.2	SWMH 10.3	48.0	1.207	1.195	0.9279	
60 minute summer	SWMH 10.3	10.3	SWMH 10.4	47.9	1.204	1.263	0.7297	
60 minute summer	SWMH 10.4	10.4	Tank 1	47.7	1.029	0.796	1.1238	

Results for 30 year 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 92.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 11.1	53	72.611	0.611	99.8	77.9414	0.0000	SURCHARGED
60 minute summer	SWMH 11.2	53	71.809	0.009	0.2	0.0000	0.0000	OK
60 minute summer	SWMH 12.1	32	73.918	0.918	15.6	2.2852	0.0000	SURCHARGED
60 minute summer	SWMH 13.1	35	72.676	0.056	1.6	0.0630	0.0000	OK
60 minute summer	Tank 1	69	72.302	0.351	108.1	167.3262	0.0000	SURCHARGED
60 minute summer	Pond 1	74	72.586	0.386	183.0	329.9309	0.0000	SURCHARGED
60 minute summer	Cat 4	51	73.240	0.130	38.9	34.7997	0.0000	OK
60 minute summer	Cat 7	52	73.378	0.208	19.0	17.7706	0.0000	OK
60 minute summer	Cat 9	47	73.166	0.056	10.3	6.5822	0.0000	OK
60 minute summer	Cat 15	53	73.480	0.330	18.4	17.5602	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.395	0.003	0.0055	2.6
60 minute summer	SWMH 11.1	Infiltration		12.1				
60 minute summer	SWMH 12.1	12.1	SWMH 6.3	16.8	0.421	0.328	1.7885	
60 minute summer	SWMH 13.1	13.1	SWMH 1.4	-1.6	-0.062	-0.037	0.7107	
60 minute summer	Tank 1	Tank 1	SWMH 8.1	4.9	0.423	0.109	0.5332	
60 minute summer	Pond 1	Pond 1	SWMH 3.1	9.2	0.572	0.100	0.5024	
60 minute summer	Cat 4	Hydro-Brake®		0.1				0.5
60 minute summer	Cat 4	Infiltration		10.9				
60 minute summer	Cat 7	Hydro-Brake®		0.1				0.6
60 minute summer	Cat 7	Infiltration		4.9				
60 minute summer	Cat 9	Hydro-Brake®		0.1				0.2
60 minute summer	Cat 9	Infiltration		4.8				
60 minute summer	Cat 15	Hydro-Brake®		0.1				0.7
60 minute summer	Cat 15	Infiltration		4.5				

Results for 30 year 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 93.44%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 1.1	33	72.952	0.148	34.6	0.7298	0.0000	OK
60 minute winter	SWMH 1.2	34	72.859	0.271	63.4	0.3066	0.0000	OK
60 minute winter	SWMH 1.3	35	72.810	0.240	63.2	0.2717	0.0000	OK
60 minute winter	SWMH 1.4	36	72.641	0.243	63.1	0.2746	0.0000	OK
60 minute winter	SWMH 1.5	78	72.621	0.321	62.6	0.3634	0.0000	SURCHARGED
60 minute winter	SWMH 2.1	34	72.903	0.161	30.1	0.9339	0.0000	OK
60 minute winter	SWMH 2.2	34	72.880	0.214	29.7	0.2423	0.0000	OK
60 minute winter	SWMH 2.3	34	72.868	0.253	29.3	0.2860	0.0000	OK
60 minute winter	SWMH 3.1	76	72.620	0.470	8.7	0.5321	0.0000	SURCHARGED
60 minute winter	SWMH 3.2	77	72.620	0.520	8.6	0.5878	0.0000	SURCHARGED
60 minute winter	SWMH 3.3	67	72.046	0.066	7.9	0.0741	0.0000	OK
60 minute winter	SWMH CON	67	71.884	0.064	7.9	0.0000	0.0000	OK
60 minute winter	SWMH 4.1	30	74.090	0.950	93.6	13.9546	23.9420	FLOOD
60 minute winter	SWMH 4.2	30	73.967	1.062	47.2	1.2006	0.0000	FLOOD RISK
60 minute winter	SWMH 4.3	35	73.826	1.188	47.2	1.3431	0.0000	SURCHARGED
60 minute winter	SWMH 4.4	30	73.770	1.230	47.3	1.3911	24.7457	FLOOD
60 minute winter	SWMH 4.5	32	73.769	1.269	100.5	1.4357	0.0000	FLOOD RISK
60 minute winter	SWMH 4.6	34	73.679	1.229	99.9	1.3900	0.0000	FLOOD RISK
60 minute winter	SWMH 4.7	34	73.519	1.179	113.3	1.3340	0.0000	FLOOD RISK
60 minute winter	SWMH 4.8	33	73.384	1.084	113.5	1.2258	0.0000	FLOOD RISK
60 minute winter	SWMH 5.1	34	73.687	0.327	25.1	1.3122	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 1.1	1.1	SWMH 1.2	34.5	0.673	0.503	2.8375	
60 minute winter	SWMH 1.2	1.2	SWMH 1.3	63.2	0.990	0.988	0.3416	
60 minute winter	SWMH 1.3	1.3	SWMH 1.4	63.1	1.046	0.919	2.7136	
60 minute winter	SWMH 1.4	1.4	SWMH 1.5	62.6	1.121	0.943	1.7232	
60 minute winter	SWMH 1.5	1.5	Pond 1	62.3	1.541	0.749	1.2504	
60 minute winter	SWMH 2.1	2.1	SWMH 2.2	29.7	0.734	0.433	0.9132	
60 minute winter	SWMH 2.2	2.2	SWMH 2.3	29.3	0.554	0.435	0.8033	
60 minute winter	SWMH 2.3	2.3	SWMH 1.2	29.2	0.448	0.454	0.5176	
60 minute winter	SWMH 3.1	3.1	SWMH 3.2	8.6	0.392	0.090	0.4727	
60 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
60 minute winter	SWMH 3.3	3.3	SWMH CON	7.9	0.706	0.102	0.3692	129.1
60 minute winter	SWMH 4.1	4.1	SWMH 4.2	47.2	0.954	0.683	4.2254	
60 minute winter	SWMH 4.2	4.2	SWMH 4.3	47.2	0.824	0.682	4.7882	
60 minute winter	SWMH 4.3	4.3	SWMH 4.4	47.3	0.672	0.660	1.6449	
60 minute winter	SWMH 4.4	4.4	SWMH 4.5	41.7	0.592	0.387	0.3005	
60 minute winter	SWMH 4.5	4.5	SWMH 4.6	99.9	1.418	1.179	0.6031	
60 minute winter	SWMH 4.6	4.6	SWMH 4.7	99.9	1.418	1.209	1.3944	
60 minute winter	SWMH 4.7	4.7	SWMH 4.8	113.5	1.612	1.374	0.5066	
60 minute winter	SWMH 4.8	4.8	Pond 1	114.2	1.884	2.925	5.5445	
60 minute winter	SWMH 5.1	5.1	SWMH 5.2	24.6	1.209	0.339	1.0433	

Results for 30 year 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 93.44%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 5.2	34	73.615	0.765	24.6	0.8655	0.0000	SURCHARGED
60 minute winter	SWMH 5.3	34	73.551	1.015	24.6	1.1477	0.0000	FLOOD RISK
60 minute winter	SWMH 6.1	29	74.050	0.946	134.3	19.5500	60.8652	FLOOD
60 minute winter	SWMH 6.2	33	73.945	1.113	51.7	1.2587	0.0000	FLOOD RISK
60 minute winter	SWMH 6.3	32	73.841	1.277	77.1	4.4021	0.0000	FLOOD RISK
60 minute winter	SWMH 7.1	60	72.970	0.770	92.4	48.1036	0.0000	SURCHARGED
60 minute winter	SWMH 7.2	60	71.708	0.008	0.2	0.0000	0.0000	OK
60 minute winter	SWMH 8.1	67	72.350	0.450	5.5	0.5095	0.0000	SURCHARGED
60 minute winter	SWMH 8.2	41	71.824	0.024	1.8	0.0000	0.0000	OK
60 minute winter	SWMH 9.1	31	73.940	1.300	106.2	16.0901	19.8073	FLOOD
60 minute winter	SWMH 9.2	42	73.466	1.016	62.7	1.1487	0.0000	SURCHARGED
60 minute winter	SWMH 9.3	42	73.185	0.835	61.7	0.9447	0.0000	SURCHARGED
60 minute winter	SWMH 9.4	42	73.079	0.769	60.3	0.8697	0.0000	SURCHARGED
60 minute winter	SWMH 9.5	44	72.507	0.507	60.3	0.5735	0.0000	SURCHARGED
60 minute winter	SWMH 10.1	35	72.977	0.317	45.0	1.7308	0.0000	SURCHARGED
60 minute winter	SWMH 10.2	36	72.521	0.281	42.8	0.3178	0.0000	SURCHARGED
60 minute winter	SWMH 10.3	66	72.351	0.250	41.7	0.2833	0.0000	SURCHARGED
60 minute winter	SWMH 10.4	67	72.351	0.351	41.5	0.3965	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 5.2	5.2	SWMH 5.3	24.6	0.871	0.406	0.9226	
60 minute winter	SWMH 5.3	5.3	SWMH 4.7	24.6	0.826	0.427	0.3627	
60 minute winter	SWMH 6.1	6.1	SWMH 6.2	51.7	0.951	0.746	4.8671	
60 minute winter	SWMH 6.2	6.2	SWMH 6.3	48.7	0.804	0.703	4.8064	
60 minute winter	SWMH 6.3	6.3	SWMH 4.5	77.1	1.095	1.051	0.5767	
60 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.2	0.533	0.002	0.0052	1.9
60 minute winter	SWMH 7.1	Infiltration		10.9				
60 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.8	0.802	0.023	0.0099	29.3
60 minute winter	SWMH 9.1	9.1	SWMH 9.2	62.7	1.577	1.544	1.2312	
60 minute winter	SWMH 9.2	9.2	SWMH 9.3	61.7	1.552	1.543	0.6674	
60 minute winter	SWMH 9.3	9.3	SWMH 9.4	60.3	1.517	1.129	0.1507	
60 minute winter	SWMH 9.4	9.4	SWMH 9.5	60.3	1.516	1.311	1.5712	
60 minute winter	SWMH 9.5	9.5	Tank 1	60.3	1.609	2.152	0.6599	
60 minute winter	SWMH 10.1	10.1	SWMH 10.2	42.8	1.138	1.015	2.5295	
60 minute winter	SWMH 10.2	10.2	SWMH 10.3	41.7	1.047	1.037	0.9279	
60 minute winter	SWMH 10.3	10.3	SWMH 10.4	41.5	1.070	1.096	0.7428	
60 minute winter	SWMH 10.4	10.4	Tank 1	41.2	0.977	0.688	1.1239	

Results for 30 year 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 93.44%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 11.1	58	72.655	0.655	80.8	88.9578	0.0000	SURCHARGED
60 minute winter	SWMH 11.2	58	71.809	0.009	0.2	0.0000	0.0000	OK
60 minute winter	SWMH 12.1	30	73.873	0.873	12.6	2.1744	0.0000	SURCHARGED
60 minute winter	SWMH 13.1	35	72.641	0.021	0.6	0.0239	0.0000	OK
60 minute winter	Tank 1	67	72.351	0.400	102.3	190.2832	0.0000	SURCHARGED
60 minute winter	Pond 1	76	72.621	0.421	173.5	362.3916	0.0000	SURCHARGED
60 minute winter	Cat 4	54	73.248	0.138	38.2	39.2997	0.0000	OK
60 minute winter	Cat 7	55	73.392	0.222	18.7	20.1280	0.0000	OK
60 minute winter	Cat 9	49	73.169	0.059	10.1	7.1991	0.0000	OK
60 minute winter	Cat 15	56	73.502	0.352	18.1	19.8788	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.399	0.003	0.0056	2.8
60 minute winter	SWMH 11.1	Infiltration		13.0				
60 minute winter	SWMH 12.1	12.1	SWMH 6.3	13.0	0.384	0.254	1.7885	
60 minute winter	SWMH 13.1	13.1	SWMH 1.4	-0.6	-0.029	-0.014	0.6243	
60 minute winter	Tank 1	Tank 1	SWMH 8.1	5.5	0.436	0.123	0.5332	
60 minute winter	Pond 1	Pond 1	SWMH 3.1	8.7	0.587	0.093	0.5024	
60 minute winter	Cat 4	Hydro-Brake®		0.1				0.5
60 minute winter	Cat 4	Infiltration		11.6				
60 minute winter	Cat 7	Hydro-Brake®		0.1				0.6
60 minute winter	Cat 7	Infiltration		5.2				
60 minute winter	Cat 9	Hydro-Brake®		0.1				0.3
60 minute winter	Cat 9	Infiltration		5.0				
60 minute winter	Cat 15	Hydro-Brake®		0.1				0.8
60 minute winter	Cat 15	Infiltration		4.8				

Results for 30 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 97.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 1.1	1140	72.949	0.145	5.1	0.7139	0.0000	OK
1440 minute summer	SWMH 1.2	1110	72.950	0.362	9.5	0.4091	0.0000	SURCHARGED
1440 minute summer	SWMH 1.3	1170	72.950	0.380	9.5	0.4296	0.0000	SURCHARGED
1440 minute summer	SWMH 1.4	1110	72.949	0.551	9.5	0.6237	0.0000	SURCHARGED
1440 minute summer	SWMH 1.5	1110	72.949	0.649	8.8	0.7342	0.0000	SURCHARGED
1440 minute summer	SWMH 2.1	1140	72.950	0.208	4.5	1.2065	0.0000	OK
1440 minute summer	SWMH 2.2	1140	72.950	0.284	4.5	0.3216	0.0000	OK
1440 minute summer	SWMH 2.3	1170	72.949	0.334	4.5	0.3783	0.0000	SURCHARGED
1440 minute summer	SWMH 3.1	1140	72.949	0.799	8.0	0.9041	0.0000	SURCHARGED
1440 minute summer	SWMH 3.2	1110	72.948	0.848	7.9	0.9593	0.0000	SURCHARGED
1440 minute summer	SWMH 3.3	720	72.046	0.066	7.9	0.0741	0.0000	OK
1440 minute summer	SWMH CON	720	71.884	0.064	7.9	0.0000	0.0000	OK
1440 minute summer	SWMH 4.1	750	73.232	0.092	13.9	1.3491	0.0000	OK
1440 minute summer	SWMH 4.2	750	72.995	0.090	13.9	0.1018	0.0000	OK
1440 minute summer	SWMH 4.3	1110	72.953	0.315	13.9	0.3565	0.0000	SURCHARGED
1440 minute summer	SWMH 4.4	1110	72.953	0.413	13.2	0.4669	0.0000	SURCHARGED
1440 minute summer	SWMH 4.5	1080	72.954	0.454	37.9	0.5131	0.0000	SURCHARGED
1440 minute summer	SWMH 4.6	1110	72.953	0.503	37.9	0.5687	0.0000	SURCHARGED
1440 minute summer	SWMH 4.7	1050	72.951	0.611	41.4	0.6914	0.0000	SURCHARGED
1440 minute summer	SWMH 4.8	1110	72.952	0.652	41.3	0.7378	0.0000	SURCHARGED
1440 minute summer	SWMH 5.1	750	73.394	0.034	3.7	0.1382	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 1.1	1.1	SWMH 1.2	5.1	0.417	0.074	2.9137	
1440 minute summer	SWMH 1.2	1.2	SWMH 1.3	9.5	0.644	0.148	0.3777	
1440 minute summer	SWMH 1.3	1.3	SWMH 1.4	9.5	0.611	0.138	3.1463	
1440 minute summer	SWMH 1.4	1.4	SWMH 1.5	8.8	0.532	0.133	1.9125	
1440 minute summer	SWMH 1.5	1.5	Pond 1	8.6	0.678	0.104	1.2504	
1440 minute summer	SWMH 2.1	2.1	SWMH 2.2	4.5	0.546	0.066	1.1987	
1440 minute summer	SWMH 2.2	2.2	SWMH 2.3	4.5	0.478	0.067	0.9562	
1440 minute summer	SWMH 2.3	2.3	SWMH 1.2	4.5	0.340	0.069	0.5593	
1440 minute summer	SWMH 3.1	3.1	SWMH 3.2	7.9	0.181	0.083	0.4727	
1440 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
1440 minute summer	SWMH 3.3	3.3	SWMH CON	7.9	0.705	0.102	0.3691	621.9
1440 minute summer	SWMH 4.1	4.1	SWMH 4.2	13.9	0.772	0.201	1.0805	
1440 minute summer	SWMH 4.2	4.2	SWMH 4.3	13.9	0.741	0.201	2.6994	
1440 minute summer	SWMH 4.3	4.3	SWMH 4.4	13.2	0.623	0.185	1.6449	
1440 minute summer	SWMH 4.4	4.4	SWMH 4.5	13.1	0.415	0.122	0.3005	
1440 minute summer	SWMH 4.5	4.5	SWMH 4.6	37.9	0.969	0.447	0.6031	
1440 minute summer	SWMH 4.6	4.6	SWMH 4.7	37.8	0.772	0.458	1.3944	
1440 minute summer	SWMH 4.7	4.7	SWMH 4.8	41.3	0.632	0.500	0.5066	
1440 minute summer	SWMH 4.8	4.8	Pond 1	41.3	0.655	1.057	5.5445	
1440 minute summer	SWMH 5.1	5.1	SWMH 5.2	3.7	0.907	0.051	0.2428	

Results for 30 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 97.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 5.2	1110	72.952	0.102	3.7	0.1153	0.0000	OK
1440 minute summer	SWMH 5.3	1110	72.952	0.416	3.7	0.4706	0.0000	SURCHARGED
1440 minute summer	SWMH 6.1	750	73.215	0.111	20.0	2.2968	0.0000	OK
1440 minute summer	SWMH 6.2	1080	72.953	0.121	20.0	0.1373	0.0000	OK
1440 minute summer	SWMH 6.3	1110	72.953	0.389	25.4	1.3419	0.0000	SURCHARGED
1440 minute summer	SWMH 7.1	780	72.930	0.730	13.8	43.6664	0.0000	SURCHARGED
1440 minute summer	SWMH 7.2	780	71.708	0.008	0.2	0.0000	0.0000	OK
1440 minute summer	SWMH 8.1	1440	72.756	0.856	4.8	0.9677	0.0000	SURCHARGED
1440 minute summer	SWMH 8.2	660	71.824	0.024	1.8	0.0000	0.0000	OK
1440 minute summer	SWMH 9.1	1440	72.759	0.119	15.8	1.4676	0.0000	OK
1440 minute summer	SWMH 9.2	1440	72.758	0.308	15.8	0.3482	0.0000	SURCHARGED
1440 minute summer	SWMH 9.3	1440	72.757	0.407	15.8	0.4605	0.0000	SURCHARGED
1440 minute summer	SWMH 9.4	1440	72.757	0.447	15.7	0.5059	0.0000	SURCHARGED
1440 minute summer	SWMH 9.5	1440	72.756	0.756	15.6	0.8554	0.0000	SURCHARGED
1440 minute summer	SWMH 10.1	1440	72.756	0.096	6.7	0.5237	0.0000	OK
1440 minute summer	SWMH 10.2	1440	72.756	0.516	6.7	0.5834	0.0000	SURCHARGED
1440 minute summer	SWMH 10.3	1440	72.756	0.656	6.3	0.7417	0.0000	SURCHARGED
1440 minute summer	SWMH 10.4	1440	72.756	0.756	6.2	0.8549	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 5.2	5.2	SWMH 5.3	3.7	0.748	0.061	0.6640	
1440 minute summer	SWMH 5.3	5.3	SWMH 4.7	3.6	0.602	0.062	0.3627	
1440 minute summer	SWMH 6.1	6.1	SWMH 6.2	20.0	0.855	0.288	1.6175	
1440 minute summer	SWMH 6.2	6.2	SWMH 6.3	20.0	0.696	0.289	3.3146	
1440 minute summer	SWMH 6.3	6.3	SWMH 4.5	24.8	0.800	0.338	0.5767	
1440 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.2	0.530	0.002	0.0051	8.8
1440 minute summer	SWMH 7.1	Infiltration		10.3				
1440 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.8	0.802	0.023	0.0099	141.1
1440 minute summer	SWMH 9.1	9.1	SWMH 9.2	15.8	0.910	0.389	0.9437	
1440 minute summer	SWMH 9.2	9.2	SWMH 9.3	15.8	0.920	0.395	0.6674	
1440 minute summer	SWMH 9.3	9.3	SWMH 9.4	15.7	1.004	0.294	0.1507	
1440 minute summer	SWMH 9.4	9.4	SWMH 9.5	15.6	0.501	0.340	1.5712	
1440 minute summer	SWMH 9.5	9.5	Tank 1	15.5	0.687	0.553	0.6599	
1440 minute summer	SWMH 10.1	10.1	SWMH 10.2	6.7	0.731	0.159	1.7766	
1440 minute summer	SWMH 10.2	10.2	SWMH 10.3	6.3	0.587	0.157	0.9279	
1440 minute summer	SWMH 10.3	10.3	SWMH 10.4	6.2	0.369	0.165	0.7428	
1440 minute summer	SWMH 10.4	10.4	Tank 1	6.2	0.307	0.103	1.1239	

Results for 30 year 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 97.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 11.1	810	72.443	0.443	12.0	42.1514	0.0000	SURCHARGED
1440 minute summer	SWMH 11.2	810	71.808	0.008	0.2	0.0000	0.0000	OK
1440 minute summer	SWMH 12.1	750	73.030	0.030	1.9	0.0736	0.0000	OK
1440 minute summer	SWMH 13.1	1110	72.950	0.330	0.2	0.3731	0.0000	SURCHARGED
1440 minute summer	Tank 1	1440	72.756	0.805	21.6	383.2130	0.0000	SURCHARGED
1440 minute summer	Pond 1	1110	72.949	0.749	49.6	679.2112	0.0000	SURCHARGED
1440 minute summer	Cat 4	780	73.178	0.068	6.5	9.9979	0.0000	OK
1440 minute summer	Cat 7	780	73.288	0.118	3.2	6.0095	0.0000	OK
1440 minute summer	Cat 9	750	73.129	0.019	1.7	0.8152	0.0000	OK
1440 minute summer	Cat 15	780	73.342	0.192	3.1	6.4496	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.380	0.002	0.0049	12.1
1440 minute summer	SWMH 11.1	Infiltration		8.7				
1440 minute summer	SWMH 12.1	12.1	SWMH 6.3	1.9	0.138	0.037	0.9630	
1440 minute summer	SWMH 13.1	13.1	SWMH 1.4	-0.2	-0.007	-0.006	1.1927	
1440 minute summer	Tank 1	Tank 1	SWMH 8.1	4.8	0.247	0.106	0.5332	
1440 minute summer	Pond 1	Pond 1	SWMH 3.1	8.0	0.457	0.086	0.5024	
1440 minute summer	Cat 4	Hydro-Brake®		0.1				2.4
1440 minute summer	Cat 4	Infiltration		5.8				
1440 minute summer	Cat 7	Hydro-Brake®		0.1				3.3
1440 minute summer	Cat 7	Infiltration		2.7				
1440 minute summer	Cat 9	Hydro-Brake®		0.0				0.8
1440 minute summer	Cat 9	Infiltration		1.6				
1440 minute summer	Cat 15	Hydro-Brake®		0.1				4.2
1440 minute summer	Cat 15	Infiltration		2.6				

Results for 30 year 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 97.45%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 1.1	1350	73.072	0.268	3.9	1.3212	0.0000	OK
1440 minute winter	SWMH 1.2	1380	73.073	0.485	7.2	0.5490	0.0000	SURCHARGED
1440 minute winter	SWMH 1.3	1350	73.071	0.501	7.0	0.5667	0.0000	SURCHARGED
1440 minute winter	SWMH 1.4	1320	73.072	0.674	6.9	0.7625	0.0000	SURCHARGED
1440 minute winter	SWMH 1.5	1320	73.071	0.771	6.4	0.8722	0.0000	SURCHARGED
1440 minute winter	SWMH 2.1	1350	73.073	0.331	3.4	1.9195	0.0000	SURCHARGED
1440 minute winter	SWMH 2.2	1350	73.074	0.408	3.4	0.4615	0.0000	SURCHARGED
1440 minute winter	SWMH 2.3	1380	73.072	0.457	3.4	0.5169	0.0000	SURCHARGED
1440 minute winter	SWMH 3.1	1320	73.072	0.922	8.0	1.0428	0.0000	SURCHARGED
1440 minute winter	SWMH 3.2	1380	73.070	0.970	8.0	1.0969	0.0000	SURCHARGED
1440 minute winter	SWMH 3.3	690	72.046	0.066	7.9	0.0741	0.0000	OK
1440 minute winter	SWMH CON	690	71.884	0.064	7.9	0.0000	0.0000	OK
1440 minute winter	SWMH 4.1	750	73.219	0.079	10.5	1.1658	0.0000	OK
1440 minute winter	SWMH 4.2	1320	73.074	0.169	10.5	0.1914	0.0000	OK
1440 minute winter	SWMH 4.3	1320	73.074	0.436	10.5	0.4934	0.0000	SURCHARGED
1440 minute winter	SWMH 4.4	1350	73.075	0.535	10.0	0.6047	0.0000	SURCHARGED
1440 minute winter	SWMH 4.5	1290	73.073	0.573	28.5	0.6484	0.0000	SURCHARGED
1440 minute winter	SWMH 4.6	1320	73.074	0.624	28.5	0.7057	0.0000	SURCHARGED
1440 minute winter	SWMH 4.7	1320	73.075	0.735	31.2	0.8309	0.0000	SURCHARGED
1440 minute winter	SWMH 4.8	1350	73.072	0.772	31.1	0.8736	0.0000	SURCHARGED
1440 minute winter	SWMH 5.1	750	73.390	0.030	2.8	0.1209	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 1.1	1.1	SWMH 1.2	3.9	0.382	0.057	3.8304	
1440 minute winter	SWMH 1.2	1.2	SWMH 1.3	7.0	0.589	0.110	0.3777	
1440 minute winter	SWMH 1.3	1.3	SWMH 1.4	6.9	0.561	0.100	3.1463	
1440 minute winter	SWMH 1.4	1.4	SWMH 1.5	6.4	0.518	0.097	1.9125	
1440 minute winter	SWMH 1.5	1.5	Pond 1	6.4	0.573	0.077	1.2504	
1440 minute winter	SWMH 2.1	2.1	SWMH 2.2	3.4	0.504	0.050	1.3922	
1440 minute winter	SWMH 2.2	2.2	SWMH 2.3	3.4	0.455	0.050	0.9654	
1440 minute winter	SWMH 2.3	2.3	SWMH 1.2	3.3	0.321	0.052	0.5593	
1440 minute winter	SWMH 3.1	3.1	SWMH 3.2	8.0	0.176	0.084	0.4727	
1440 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
1440 minute winter	SWMH 3.3	3.3	SWMH CON	7.9	0.706	0.102	0.3692	605.3
1440 minute winter	SWMH 4.1	4.1	SWMH 4.2	10.5	0.714	0.152	1.3554	
1440 minute winter	SWMH 4.2	4.2	SWMH 4.3	10.5	0.714	0.152	3.7864	
1440 minute winter	SWMH 4.3	4.3	SWMH 4.4	10.0	0.624	0.140	1.6449	
1440 minute winter	SWMH 4.4	4.4	SWMH 4.5	9.9	0.418	0.092	0.3005	
1440 minute winter	SWMH 4.5	4.5	SWMH 4.6	28.5	0.952	0.336	0.6031	
1440 minute winter	SWMH 4.6	4.6	SWMH 4.7	28.5	0.753	0.344	1.3944	
1440 minute winter	SWMH 4.7	4.7	SWMH 4.8	31.1	0.624	0.377	0.5066	
1440 minute winter	SWMH 4.8	4.8	Pond 1	31.1	0.701	0.797	5.5445	
1440 minute winter	SWMH 5.1	5.1	SWMH 5.2	2.8	0.834	0.039	0.5335	

Results for 30 year 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 97.45%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 5.2	1320	73.073	0.223	2.8	0.2528	0.0000	OK
1440 minute winter	SWMH 5.3	1320	73.073	0.537	2.8	0.6072	0.0000	SURCHARGED
1440 minute winter	SWMH 6.1	750	73.199	0.095	15.0	1.9686	0.0000	OK
1440 minute winter	SWMH 6.2	1320	73.074	0.242	15.0	0.2742	0.0000	OK
1440 minute winter	SWMH 6.3	1320	73.074	0.510	19.1	1.7586	0.0000	SURCHARGED
1440 minute winter	SWMH 7.1	810	72.850	0.650	10.4	35.5221	0.0000	SURCHARGED
1440 minute winter	SWMH 7.2	810	71.708	0.008	0.2	0.0000	0.0000	OK
1440 minute winter	SWMH 8.1	1410	72.875	0.975	4.1	1.1022	0.0000	SURCHARGED
1440 minute winter	SWMH 8.2	1410	71.824	0.024	1.8	0.0000	0.0000	OK
1440 minute winter	SWMH 9.1	1410	72.877	0.237	11.9	2.9308	0.0000	SURCHARGED
1440 minute winter	SWMH 9.2	1410	72.877	0.427	11.9	0.4834	0.0000	SURCHARGED
1440 minute winter	SWMH 9.3	1410	72.877	0.527	11.9	0.5962	0.0000	SURCHARGED
1440 minute winter	SWMH 9.4	1380	72.874	0.564	11.8	0.6384	0.0000	SURCHARGED
1440 minute winter	SWMH 9.5	1380	72.875	0.875	11.7	0.9895	0.0000	SURCHARGED
1440 minute winter	SWMH 10.1	1410	72.875	0.215	5.0	1.1750	0.0000	OK
1440 minute winter	SWMH 10.2	1410	72.875	0.635	5.0	0.7180	0.0000	SURCHARGED
1440 minute winter	SWMH 10.3	1410	72.875	0.775	4.9	0.8763	0.0000	SURCHARGED
1440 minute winter	SWMH 10.4	1410	72.875	0.875	4.8	0.9894	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 5.2	5.2	SWMH 5.3	2.8	0.722	0.046	0.9220	
1440 minute winter	SWMH 5.3	5.3	SWMH 4.7	2.7	0.595	0.047	0.3627	
1440 minute winter	SWMH 6.1	6.1	SWMH 6.2	15.0	0.790	0.216	2.2962	
1440 minute winter	SWMH 6.2	6.2	SWMH 6.3	15.0	0.666	0.216	4.4851	
1440 minute winter	SWMH 6.3	6.3	SWMH 4.5	18.6	0.796	0.254	0.5767	
1440 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.2	0.522	0.002	0.0050	9.3
1440 minute winter	SWMH 7.1	Infiltration		9.1				
1440 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.8	0.805	0.023	0.0099	149.2
1440 minute winter	SWMH 9.1	9.1	SWMH 9.2	11.9	0.878	0.293	1.2312	
1440 minute winter	SWMH 9.2	9.2	SWMH 9.3	11.9	0.854	0.297	0.6674	
1440 minute winter	SWMH 9.3	9.3	SWMH 9.4	11.8	0.927	0.221	0.1507	
1440 minute winter	SWMH 9.4	9.4	SWMH 9.5	11.7	0.521	0.254	1.5712	
1440 minute winter	SWMH 9.5	9.5	Tank 1	11.6	0.685	0.414	0.6599	
1440 minute winter	SWMH 10.1	10.1	SWMH 10.2	5.0	0.673	0.119	2.5085	
1440 minute winter	SWMH 10.2	10.2	SWMH 10.3	4.9	0.558	0.121	0.9279	
1440 minute winter	SWMH 10.3	10.3	SWMH 10.4	4.8	0.383	0.127	0.7428	
1440 minute winter	SWMH 10.4	10.4	Tank 1	4.8	0.329	0.080	1.1239	

Results for 30 year 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 97.45%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 11.1	810	72.398	0.398	9.1	34.5031	0.0000	SURCHARGED
1440 minute winter	SWMH 11.2	810	71.808	0.008	0.2	0.0000	0.0000	OK
1440 minute winter	SWMH 12.1	1350	73.074	0.074	1.4	0.1847	0.0000	OK
1440 minute winter	SWMH 13.1	1320	73.075	0.455	0.4	0.5141	0.0000	SURCHARGED
1440 minute winter	Tank 1	1410	72.875	0.924	16.4	439.8485	0.0000	SURCHARGED
1440 minute winter	Pond 1	1350	73.071	0.871	37.2	804.7692	0.0000	SURCHARGED
1440 minute winter	Cat 4	780	73.166	0.056	4.9	6.7837	0.0000	OK
1440 minute winter	Cat 7	780	73.266	0.096	2.4	4.1422	0.0000	OK
1440 minute winter	Cat 9	780	73.125	0.015	1.3	0.5006	0.0000	OK
1440 minute winter	Cat 15	780	73.308	0.158	2.3	4.5113	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.376	0.002	0.0048	12.0
1440 minute winter	SWMH 11.1	Infiltration		7.8				
1440 minute winter	SWMH 12.1	12.1	SWMH 6.3	1.4	0.133	0.027	1.1503	
1440 minute winter	SWMH 13.1	13.1	SWMH 1.4	-0.4	-0.010	-0.009	1.1927	
1440 minute winter	Tank 1	Tank 1	SWMH 8.1	4.1	0.232	0.092	0.5332	
1440 minute winter	Pond 1	Pond 1	SWMH 3.1	8.0	0.427	0.086	0.5024	
1440 minute winter	Cat 4	Hydro-Brake®		0.1				2.8
1440 minute winter	Cat 4	Infiltration		4.7				
1440 minute winter	Cat 7	Hydro-Brake®		0.1				3.7
1440 minute winter	Cat 7	Infiltration		2.2				
1440 minute winter	Cat 9	Hydro-Brake®		0.0				0.8
1440 minute winter	Cat 9	Infiltration		1.3				
1440 minute winter	Cat 15	Hydro-Brake®		0.1				4.3
1440 minute winter	Cat 15	Infiltration		2.1				

Results for 100 year +20% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 92.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 1.1	11	74.054	1.250	93.5	6.1521	0.0000	FLOOD RISK
15 minute summer	SWMH 1.2	11	73.647	1.059	95.9	1.1975	0.0000	SURCHARGED
15 minute summer	SWMH 1.3	11	73.582	1.012	97.2	1.1449	0.0000	SURCHARGED
15 minute summer	SWMH 1.4	11	73.285	0.887	100.1	1.0030	0.0000	SURCHARGED
15 minute summer	SWMH 1.5	10	73.114	0.814	101.5	0.9203	0.0000	SURCHARGED
15 minute summer	SWMH 2.1	10	73.630	0.888	83.3	5.1442	11.8909	FLOOD
15 minute summer	SWMH 2.2	11	73.637	0.971	51.9	1.0981	0.0000	FLOOD RISK
15 minute summer	SWMH 2.3	11	73.643	1.028	44.3	1.1628	0.0000	FLOOD RISK
15 minute summer	SWMH 3.1	38	72.426	0.276	10.4	0.3118	0.0000	OK
15 minute summer	SWMH 3.2	38	72.425	0.325	7.9	0.3678	0.0000	SURCHARGED
15 minute summer	SWMH 3.3	39	72.044	0.064	7.5	0.0725	0.0000	OK
15 minute summer	SWMH CON	39	71.883	0.063	7.5	0.0000	0.0000	OK
15 minute summer	SWMH 4.1	9	74.090	0.950	252.9	13.9546	51.5665	FLOOD
15 minute summer	SWMH 4.2	9	73.967	1.062	78.0	1.2016	0.0000	FLOOD RISK
15 minute summer	SWMH 4.3	15	73.826	1.188	71.6	1.3431	0.0000	SURCHARGED
15 minute summer	SWMH 4.4	9	73.770	1.230	50.5	1.3911	19.6708	FLOOD
15 minute summer	SWMH 4.5	9	73.770	1.270	132.9	1.4364	12.1163	FLOOD
15 minute summer	SWMH 4.6	9	73.690	1.240	91.0	1.4024	4.0310	FLOOD
15 minute summer	SWMH 4.7	9	73.600	1.260	103.5	1.4251	2.3474	FLOOD
15 minute summer	SWMH 4.8	9	73.600	1.300	103.7	1.4700	0.0000	FLOOD RISK
15 minute summer	SWMH 5.1	11	74.376	1.016	67.9	4.0766	0.0000	FLOOD RISK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 1.1	1.1	SWMH 1.2	86.0	1.222	1.252	3.9397	
15 minute summer	SWMH 1.2	1.2	SWMH 1.3	97.2	1.380	1.518	0.3777	
15 minute summer	SWMH 1.3	1.3	SWMH 1.4	98.5	1.399	1.436	3.1463	
15 minute summer	SWMH 1.4	1.4	SWMH 1.5	101.5	1.442	1.529	1.9125	
15 minute summer	SWMH 1.5	1.5	Pond 1	104.8	2.265	1.260	0.7623	
15 minute summer	SWMH 2.1	2.1	SWMH 2.2	51.9	0.851	0.757	1.3922	
15 minute summer	SWMH 2.2	2.2	SWMH 2.3	44.3	0.645	0.656	0.9654	
15 minute summer	SWMH 2.3	2.3	SWMH 1.2	47.4	0.673	0.735	0.5593	
15 minute summer	SWMH 3.1	3.1	SWMH 3.2	7.9	0.510	0.082	0.4637	
15 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.5	0.690	0.095	0.2562	
15 minute summer	SWMH 3.3	3.3	SWMH CON	7.5	0.696	0.098	0.3575	103.8
15 minute summer	SWMH 4.1	4.1	SWMH 4.2	78.0	1.153	1.127	4.2254	
15 minute summer	SWMH 4.2	4.2	SWMH 4.3	64.2	1.084	0.926	4.7882	
15 minute summer	SWMH 4.3	4.3	SWMH 4.4	50.5	0.717	0.705	1.6449	
15 minute summer	SWMH 4.4	4.4	SWMH 4.5	39.2	0.556	0.364	0.3005	
15 minute summer	SWMH 4.5	4.5	SWMH 4.6	91.0	1.292	1.074	0.6031	
15 minute summer	SWMH 4.6	4.6	SWMH 4.7	91.2	1.296	1.105	1.3944	
15 minute summer	SWMH 4.7	4.7	SWMH 4.8	103.7	1.473	1.255	0.5066	
15 minute summer	SWMH 4.8	4.8	Pond 1	105.9	2.083	2.711	4.9235	
15 minute summer	SWMH 5.1	5.1	SWMH 5.2	58.9	1.584	0.811	1.0433	

Results for 100 year +20% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 92.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 5.2	12	73.970	1.120	58.9	1.2670	0.0000	FLOOD RISK
15 minute summer	SWMH 5.3	9	73.600	1.064	59.3	1.2034	11.9563	FLOOD
15 minute summer	SWMH 6.1	9	74.050	0.946	362.9	19.5500	88.6014	FLOOD
15 minute summer	SWMH 6.2	9	74.024	1.192	81.5	1.3486	0.0000	FLOOD RISK
15 minute summer	SWMH 6.3	10	73.962	1.398	126.2	4.8197	0.0000	FLOOD RISK
15 minute summer	SWMH 7.1	19	72.843	0.643	249.8	34.7667	0.0000	SURCHARGED
15 minute summer	SWMH 7.2	19	71.707	0.007	0.2	0.0000	0.0000	OK
15 minute summer	SWMH 8.1	24	72.171	0.271	6.3	0.3061	0.0000	SURCHARGED
15 minute summer	SWMH 8.2	25	71.824	0.024	1.8	0.0000	0.0000	OK
15 minute summer	SWMH 9.1	8	73.940	1.300	287.1	16.0901	66.2766	FLOOD
15 minute summer	SWMH 9.2	9	73.534	1.084	60.7	1.2255	0.0000	SURCHARGED
15 minute summer	SWMH 9.3	9	73.291	0.941	60.2	1.0640	0.0000	SURCHARGED
15 minute summer	SWMH 9.4	9	73.198	0.888	60.3	1.0045	0.0000	SURCHARGED
15 minute summer	SWMH 9.5	7	72.755	0.755	60.3	0.8541	0.0000	SURCHARGED
15 minute summer	SWMH 10.1	10	74.090	1.430	121.8	7.8178	8.5128	FLOOD
15 minute summer	SWMH 10.2	12	73.035	0.795	64.5	0.8986	0.0000	SURCHARGED
15 minute summer	SWMH 10.3	13	72.606	0.506	63.4	0.5728	0.0000	SURCHARGED
15 minute summer	SWMH 10.4	13	72.251	0.251	63.4	0.2837	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 5.2	5.2	SWMH 5.3	59.3	1.490	0.979	0.9226	
15 minute summer	SWMH 5.3	5.3	SWMH 4.7	27.0	1.061	0.468	0.3627	
15 minute summer	SWMH 6.1	6.1	SWMH 6.2	81.5	1.194	1.175	4.8671	
15 minute summer	SWMH 6.2	6.2	SWMH 6.3	57.4	0.988	0.828	4.8064	
15 minute summer	SWMH 6.3	6.3	SWMH 4.5	126.0	1.789	1.717	0.5767	
15 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.2	0.521	0.002	0.0049	1.4
15 minute summer	SWMH 7.1	Infiltration		9.0				
15 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.8	0.801	0.023	0.0098	26.0
15 minute summer	SWMH 9.1	9.1	SWMH 9.2	60.7	1.527	1.495	1.2312	
15 minute summer	SWMH 9.2	9.2	SWMH 9.3	60.2	1.514	1.505	0.6674	
15 minute summer	SWMH 9.3	9.3	SWMH 9.4	60.3	1.516	1.128	0.1507	
15 minute summer	SWMH 9.4	9.4	SWMH 9.5	60.3	1.518	1.312	1.5712	
15 minute summer	SWMH 9.5	9.5	Tank 1	61.2	2.238	2.185	0.6454	
15 minute summer	SWMH 10.1	10.1	SWMH 10.2	64.5	1.621	1.530	2.5295	
15 minute summer	SWMH 10.2	10.2	SWMH 10.3	63.4	1.594	1.578	0.9279	
15 minute summer	SWMH 10.3	10.3	SWMH 10.4	63.4	1.594	1.672	0.7428	
15 minute summer	SWMH 10.4	10.4	Tank 1	63.4	1.125	1.058	0.8920	

Results for 100 year +20% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 92.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH 11.1	18	72.643	0.643	218.4	85.7334	0.0000	SURCHARGED
15 minute summer	SWMH 11.2	19	71.809	0.009	0.2	0.0000	0.0000	OK
15 minute summer	SWMH 12.1	10	74.178	1.178	49.8	2.9333	0.0000	FLOOD RISK
15 minute summer	SWMH 13.1	10	73.301	0.681	7.2	0.7703	0.0000	SURCHARGED
15 minute summer	Tank 1	29	72.161	0.210	124.4	99.8087	0.0000	OK
15 minute summer	Pond 1	39	72.426	0.226	206.0	188.1886	0.0000	OK
15 minute summer	Cat 4	24	73.250	0.140	57.1	40.4923	0.0000	OK
15 minute summer	Cat 7	25	73.393	0.223	28.0	20.3189	0.0000	OK
15 minute summer	Cat 9	23	73.175	0.065	15.1	8.7610	0.0000	OK
15 minute summer	Cat 15	25	73.502	0.352	27.1	19.8311	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.398	0.003	0.0055	2.3
15 minute summer	SWMH 11.1	Infiltration		12.7				
15 minute summer	SWMH 12.1	12.1	SWMH 6.3	33.7	0.848	0.659	1.7885	
15 minute summer	SWMH 13.1	13.1	SWMH 1.4	-7.2	-0.297	-0.161	1.1927	
15 minute summer	Tank 1	Tank 1	SWMH 8.1	6.3	0.553	0.140	0.4699	
15 minute summer	Pond 1	Pond 1	SWMH 3.1	10.4	0.710	0.112	0.4447	
15 minute summer	Cat 4	Hydro-Brake®		0.1				0.4
15 minute summer	Cat 4	Infiltration		11.8				
15 minute summer	Cat 7	Hydro-Brake®		0.1				0.5
15 minute summer	Cat 7	Infiltration		5.2				
15 minute summer	Cat 9	Hydro-Brake®		0.1				0.2
15 minute summer	Cat 9	Infiltration		5.6				
15 minute summer	Cat 15	Hydro-Brake®		0.1				0.6
15 minute summer	Cat 15	Infiltration		4.8				

Results for 100 year +20% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 93.26%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 1.1	11	74.060	1.256	98.3	6.1808	0.0868	FLOOD
15 minute winter	SWMH 1.2	10	73.681	1.093	98.6	1.2366	0.0000	SURCHARGED
15 minute winter	SWMH 1.3	10	73.620	1.050	99.6	1.1872	0.0000	SURCHARGED
15 minute winter	SWMH 1.4	10	73.342	0.944	102.0	1.0671	0.0000	SURCHARGED
15 minute winter	SWMH 1.5	10	73.175	0.875	103.1	0.9895	0.0000	SURCHARGED
15 minute winter	SWMH 2.1	10	73.630	0.888	90.9	5.1442	15.0996	FLOOD
15 minute winter	SWMH 2.2	10	73.660	0.994	42.2	1.1237	0.0000	FLOOD RISK
15 minute winter	SWMH 2.3	10	73.675	1.060	44.5	1.1986	0.0000	FLOOD RISK
15 minute winter	SWMH 3.1	39	72.433	0.283	10.5	0.3202	0.0000	OK
15 minute winter	SWMH 3.2	39	72.433	0.333	8.4	0.3761	0.0000	SURCHARGED
15 minute winter	SWMH 3.3	39	72.044	0.064	7.6	0.0726	0.0000	OK
15 minute winter	SWMH CON	39	71.883	0.063	7.6	0.0000	0.0000	OK
15 minute winter	SWMH 4.1	8	74.090	0.950	265.9	13.9546	67.4503	FLOOD
15 minute winter	SWMH 4.2	10	73.967	1.062	74.3	1.2008	0.0000	FLOOD RISK
15 minute winter	SWMH 4.3	10	73.826	1.188	51.4	1.3439	0.0000	SURCHARGED
15 minute winter	SWMH 4.4	9	73.770	1.230	49.9	1.3911	21.0748	FLOOD
15 minute winter	SWMH 4.5	9	73.770	1.270	133.7	1.4364	13.3617	FLOOD
15 minute winter	SWMH 4.6	9	73.690	1.240	90.1	1.4024	3.9533	FLOOD
15 minute winter	SWMH 4.7	9	73.600	1.260	104.4	1.4251	1.5913	FLOOD
15 minute winter	SWMH 4.8	9	73.567	1.267	104.4	1.4332	0.0000	FLOOD RISK
15 minute winter	SWMH 5.1	11	74.463	1.103	71.5	4.4281	0.0000	FLOOD RISK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 1.1	1.1	SWMH 1.2	90.6	1.286	1.318	3.9397	
15 minute winter	SWMH 1.2	1.2	SWMH 1.3	99.6	1.414	1.556	0.3777	
15 minute winter	SWMH 1.3	1.3	SWMH 1.4	100.9	1.432	1.470	3.1463	
15 minute winter	SWMH 1.4	1.4	SWMH 1.5	103.1	1.464	1.552	1.9125	
15 minute winter	SWMH 1.5	1.5	Pond 1	105.6	2.255	1.270	0.7960	
15 minute winter	SWMH 2.1	2.1	SWMH 2.2	42.2	0.843	0.615	1.3922	
15 minute winter	SWMH 2.2	2.2	SWMH 2.3	44.5	0.668	0.660	0.9654	
15 minute winter	SWMH 2.3	2.3	SWMH 1.2	47.7	0.678	0.741	0.5593	
15 minute winter	SWMH 3.1	3.1	SWMH 3.2	8.4	0.516	0.087	0.4675	
15 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.6	0.691	0.096	0.2571	
15 minute winter	SWMH 3.3	3.3	SWMH CON	7.6	0.697	0.098	0.3587	104.7
15 minute winter	SWMH 4.1	4.1	SWMH 4.2	74.3	1.161	1.073	4.2254	
15 minute winter	SWMH 4.2	4.2	SWMH 4.3	51.4	1.124	0.741	4.7882	
15 minute winter	SWMH 4.3	4.3	SWMH 4.4	49.9	0.708	0.696	1.6449	
15 minute winter	SWMH 4.4	4.4	SWMH 4.5	39.7	0.563	0.369	0.3005	
15 minute winter	SWMH 4.5	4.5	SWMH 4.6	90.1	1.279	1.063	0.6031	
15 minute winter	SWMH 4.6	4.6	SWMH 4.7	91.2	1.295	1.104	1.3944	
15 minute winter	SWMH 4.7	4.7	SWMH 4.8	104.4	1.483	1.264	0.5066	
15 minute winter	SWMH 4.8	4.8	Pond 1	107.1	2.081	2.742	5.0052	
15 minute winter	SWMH 5.1	5.1	SWMH 5.2	62.2	1.564	0.856	1.0433	

Results for 100 year +20% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 93.26%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 5.2	12	74.008	1.158	62.2	1.3098	0.0000	FLOOD RISK
15 minute winter	SWMH 5.3	9	73.600	1.064	62.2	1.2034	14.1903	FLOOD
15 minute winter	SWMH 6.1	8	74.050	0.946	381.7	19.5500	114.8996	FLOOD
15 minute winter	SWMH 6.2	10	74.011	1.179	82.8	1.3339	0.0000	FLOOD RISK
15 minute winter	SWMH 6.3	10	73.968	1.404	128.7	4.8396	0.0000	FLOOD RISK
15 minute winter	SWMH 7.1	19	72.962	0.762	262.7	47.2022	0.0000	SURCHARGED
15 minute winter	SWMH 7.2	19	71.708	0.008	0.2	0.0000	0.0000	OK
15 minute winter	SWMH 8.1	25	72.179	0.279	6.2	0.3150	0.0000	SURCHARGED
15 minute winter	SWMH 8.2	26	71.824	0.024	1.8	0.0000	0.0000	OK
15 minute winter	SWMH 9.1	8	73.940	1.300	301.9	16.0901	75.5728	FLOOD
15 minute winter	SWMH 9.2	8	73.547	1.097	60.2	1.2413	0.0000	SURCHARGED
15 minute winter	SWMH 9.3	8	73.319	0.969	60.3	1.0959	0.0000	SURCHARGED
15 minute winter	SWMH 9.4	8	73.234	0.924	60.3	1.0455	0.0000	SURCHARGED
15 minute winter	SWMH 9.5	7	72.811	0.811	60.4	0.9169	0.0000	SURCHARGED
15 minute winter	SWMH 10.1	10	74.090	1.430	128.0	7.8178	10.1029	FLOOD
15 minute winter	SWMH 10.2	13	73.035	0.795	63.9	0.8987	0.0000	SURCHARGED
15 minute winter	SWMH 10.3	13	72.607	0.506	63.4	0.5728	0.0000	SURCHARGED
15 minute winter	SWMH 10.4	13	72.251	0.251	63.4	0.2837	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 5.2	5.2	SWMH 5.3	62.2	1.564	1.027	0.9226	
15 minute winter	SWMH 5.3	5.3	SWMH 4.7	27.6	1.108	0.478	0.3627	
15 minute winter	SWMH 6.1	6.1	SWMH 6.2	82.8	1.221	1.194	4.8671	
15 minute winter	SWMH 6.2	6.2	SWMH 6.3	65.2	1.008	0.941	4.8064	
15 minute winter	SWMH 6.3	6.3	SWMH 4.5	127.9	1.817	1.744	0.5767	
15 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.2	0.533	0.002	0.0052	1.7
15 minute winter	SWMH 7.1	Infiltration		10.7				
15 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.8	0.801	0.023	0.0098	26.2
15 minute winter	SWMH 9.1	9.1	SWMH 9.2	60.2	1.514	1.482	1.2312	
15 minute winter	SWMH 9.2	9.2	SWMH 9.3	60.3	1.516	1.507	0.6674	
15 minute winter	SWMH 9.3	9.3	SWMH 9.4	60.3	1.517	1.129	0.1507	
15 minute winter	SWMH 9.4	9.4	SWMH 9.5	60.4	1.518	1.313	1.5712	
15 minute winter	SWMH 9.5	9.5	Tank 1	61.5	2.294	2.195	0.6547	
15 minute winter	SWMH 10.1	10.1	SWMH 10.2	63.9	1.607	1.516	2.5295	
15 minute winter	SWMH 10.2	10.2	SWMH 10.3	63.4	1.594	1.578	0.9279	
15 minute winter	SWMH 10.3	10.3	SWMH 10.4	63.4	1.594	1.672	0.7428	
15 minute winter	SWMH 10.4	10.4	Tank 1	63.4	1.125	1.058	0.8920	

Results for 100 year +20% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 93.26%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 11.1	18	72.684	0.684	229.7	96.6879	0.0000	SURCHARGED
15 minute winter	SWMH 11.2	19	71.809	0.009	0.2	0.0000	0.0000	OK
15 minute winter	SWMH 12.1	10	74.200	1.200	36.0	2.9882	0.0000	FLOOD RISK
15 minute winter	SWMH 13.1	10	73.340	0.720	23.1	0.8147	0.0000	SURCHARGED
15 minute winter	Tank 1	28	72.171	0.220	124.6	104.8064	0.0000	OK
15 minute winter	Pond 1	38	72.434	0.234	208.2	194.7868	0.0000	OK
15 minute winter	Cat 4	25	73.259	0.149	64.0	45.8083	0.0000	OK
15 minute winter	Cat 7	25	73.408	0.238	31.4	22.9691	0.0000	OK
15 minute winter	Cat 9	24	73.179	0.069	17.0	9.9745	0.0000	OK
15 minute winter	Cat 15	25	73.525	0.375	30.3	22.4027	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.401	0.003	0.0056	2.4
15 minute winter	SWMH 11.1	Infiltration		13.5				
15 minute winter	SWMH 12.1	12.1	SWMH 6.3	35.2	0.885	0.688	1.7885	
15 minute winter	SWMH 13.1	13.1	SWMH 1.4	-23.1	-0.665	-0.517	1.1927	
15 minute winter	Tank 1	Tank 1	SWMH 8.1	6.2	0.532	0.139	0.4838	
15 minute winter	Pond 1	Pond 1	SWMH 3.1	10.5	0.645	0.113	0.4557	
15 minute winter	Cat 4	Hydro-Brake®		0.1				0.5
15 minute winter	Cat 4	Infiltration		12.6				
15 minute winter	Cat 7	Hydro-Brake®		0.1				0.6
15 minute winter	Cat 7	Infiltration		5.6				
15 minute winter	Cat 9	Hydro-Brake®		0.1				0.2
15 minute winter	Cat 9	Infiltration		5.7				
15 minute winter	Cat 15	Hydro-Brake®		0.1				0.7
15 minute winter	Cat 15	Infiltration		5.2				

Results for 100 year +20% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 95.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 1.1	35	73.562	0.758	66.6	3.7308	0.0000	SURCHARGED
60 minute summer	SWMH 1.2	36	73.406	0.818	102.4	0.9257	0.0000	SURCHARGED
60 minute summer	SWMH 1.3	36	73.314	0.744	101.1	0.8414	0.0000	SURCHARGED
60 minute summer	SWMH 1.4	36	72.902	0.504	100.7	0.5699	0.0000	SURCHARGED
60 minute summer	SWMH 1.5	78	72.687	0.387	99.8	0.4372	0.0000	SURCHARGED
60 minute summer	SWMH 2.1	35	73.511	0.769	57.9	4.4558	0.0000	FLOOD RISK
60 minute summer	SWMH 2.2	36	73.465	0.799	47.6	0.9035	0.0000	SURCHARGED
60 minute summer	SWMH 2.3	36	73.431	0.816	46.3	0.9229	0.0000	SURCHARGED
60 minute summer	SWMH 3.1	80	72.686	0.536	9.2	0.6061	0.0000	SURCHARGED
60 minute summer	SWMH 3.2	80	72.685	0.585	8.4	0.6619	0.0000	SURCHARGED
60 minute summer	SWMH 3.3	264	72.046	0.066	7.9	0.0741	0.0000	OK
60 minute summer	SWMH CON	264	71.884	0.064	7.9	0.0000	0.0000	OK
60 minute summer	SWMH 4.1	28	74.090	0.950	180.1	13.9546	68.2467	FLOOD
60 minute summer	SWMH 4.2	28	73.982	1.077	47.2	1.2181	0.0000	FLOOD RISK
60 minute summer	SWMH 4.3	29	73.827	1.189	47.3	1.3445	0.0000	SURCHARGED
60 minute summer	SWMH 4.4	28	73.770	1.230	47.4	1.3911	35.9606	FLOOD
60 minute summer	SWMH 4.5	28	73.770	1.270	106.6	1.4364	9.2694	FLOOD
60 minute summer	SWMH 4.6	31	73.690	1.240	97.6	1.4024	0.0525	FLOOD
60 minute summer	SWMH 4.7	31	73.551	1.211	116.4	1.3694	0.0000	FLOOD RISK
60 minute summer	SWMH 4.8	31	73.413	1.113	116.9	1.2590	0.0000	FLOOD RISK
60 minute summer	SWMH 5.1	34	74.087	0.727	48.4	2.9178	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 1.1	1.1	SWMH 1.2	57.6	0.818	0.838	3.9397	
60 minute summer	SWMH 1.2	1.2	SWMH 1.3	101.1	1.436	1.580	0.3777	
60 minute summer	SWMH 1.3	1.3	SWMH 1.4	100.7	1.430	1.468	3.1463	
60 minute summer	SWMH 1.4	1.4	SWMH 1.5	99.8	1.417	1.503	1.9125	
60 minute summer	SWMH 1.5	1.5	Pond 1	98.2	1.660	1.181	1.2504	
60 minute summer	SWMH 2.1	2.1	SWMH 2.2	47.6	0.758	0.695	1.3922	
60 minute summer	SWMH 2.2	2.2	SWMH 2.3	46.3	0.657	0.686	0.9654	
60 minute summer	SWMH 2.3	2.3	SWMH 1.2	45.8	0.651	0.711	0.5593	
60 minute summer	SWMH 3.1	3.1	SWMH 3.2	8.4	0.409	0.088	0.4727	
60 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
60 minute summer	SWMH 3.3	3.3	SWMH CON	7.9	0.706	0.102	0.3692	130.3
60 minute summer	SWMH 4.1	4.1	SWMH 4.2	47.2	0.886	0.683	4.2254	
60 minute summer	SWMH 4.2	4.2	SWMH 4.3	47.3	0.857	0.682	4.7882	
60 minute summer	SWMH 4.3	4.3	SWMH 4.4	47.4	0.681	0.662	1.6449	
60 minute summer	SWMH 4.4	4.4	SWMH 4.5	38.4	0.545	0.357	0.3005	
60 minute summer	SWMH 4.5	4.5	SWMH 4.6	97.6	1.387	1.153	0.6031	
60 minute summer	SWMH 4.6	4.6	SWMH 4.7	97.1	1.380	1.176	1.3944	
60 minute summer	SWMH 4.7	4.7	SWMH 4.8	116.9	1.660	1.415	0.5066	
60 minute summer	SWMH 4.8	4.8	Pond 1	118.3	1.879	3.028	5.5445	
60 minute summer	SWMH 5.1	5.1	SWMH 5.2	46.6	1.173	0.642	1.0433	

Results for 100 year +20% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 95.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 5.2	34	73.831	0.981	46.6	1.1097	0.0000	FLOOD RISK
60 minute summer	SWMH 5.3	31	73.600	1.064	46.7	1.2034	4.2676	FLOOD
60 minute summer	SWMH 6.1	27	74.050	0.946	258.5	19.5500	130.9328	FLOOD
60 minute summer	SWMH 6.2	33	73.976	1.144	53.4	1.2933	0.0000	FLOOD RISK
60 minute summer	SWMH 6.3	33	73.902	1.338	104.5	4.6112	0.0000	FLOOD RISK
60 minute summer	SWMH 7.1	61	73.284	1.084	177.9	89.8237	0.0000	FLOOD RISK
60 minute summer	SWMH 7.2	61	71.708	0.008	0.3	0.0000	0.0000	OK
60 minute summer	SWMH 8.1	70	72.422	0.522	6.3	0.5905	0.0000	SURCHARGED
60 minute summer	SWMH 8.2	38	71.824	0.024	1.8	0.0000	0.0000	OK
60 minute summer	SWMH 9.1	29	73.940	1.300	204.5	16.0901	67.8153	FLOOD
60 minute summer	SWMH 9.2	42	73.480	1.030	63.7	1.1648	0.0000	SURCHARGED
60 minute summer	SWMH 9.3	43	73.206	0.856	62.3	0.9686	0.0000	SURCHARGED
60 minute summer	SWMH 9.4	43	73.105	0.795	60.3	0.8991	0.0000	SURCHARGED
60 minute summer	SWMH 9.5	45	72.552	0.552	60.3	0.6244	0.0000	SURCHARGED
60 minute summer	SWMH 10.1	33	74.090	1.430	86.8	7.8178	3.0836	FLOOD
60 minute summer	SWMH 10.2	36	73.042	0.802	64.4	0.9068	0.0000	SURCHARGED
60 minute summer	SWMH 10.3	37	72.620	0.520	63.3	0.5883	0.0000	SURCHARGED
60 minute summer	SWMH 10.4	71	72.422	0.422	63.2	0.4777	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 5.2	5.2	SWMH 5.3	46.7	1.175	0.771	0.9226	
60 minute summer	SWMH 5.3	5.3	SWMH 4.7	34.3	0.867	0.595	0.3627	
60 minute summer	SWMH 6.1	6.1	SWMH 6.2	53.4	0.969	0.769	4.8671	
60 minute summer	SWMH 6.2	6.2	SWMH 6.3	49.5	0.835	0.714	4.8064	
60 minute summer	SWMH 6.3	6.3	SWMH 4.5	104.5	1.484	1.424	0.5767	
60 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.3	0.556	0.002	0.0058	2.8
60 minute summer	SWMH 7.1	Infiltration		15.4				
60 minute summer	SWMH 8.1	8.1	SWMH 8.2	1.8	0.802	0.023	0.0099	28.5
60 minute summer	SWMH 9.1	9.1	SWMH 9.2	63.7	1.602	1.568	1.2312	
60 minute summer	SWMH 9.2	9.2	SWMH 9.3	62.3	1.566	1.557	0.6674	
60 minute summer	SWMH 9.3	9.3	SWMH 9.4	60.3	1.517	1.129	0.1507	
60 minute summer	SWMH 9.4	9.4	SWMH 9.5	60.3	1.516	1.311	1.5712	
60 minute summer	SWMH 9.5	9.5	Tank 1	60.3	1.611	2.153	0.6599	
60 minute summer	SWMH 10.1	10.1	SWMH 10.2	64.4	1.619	1.528	2.5295	
60 minute summer	SWMH 10.2	10.2	SWMH 10.3	63.3	1.593	1.577	0.9279	
60 minute summer	SWMH 10.3	10.3	SWMH 10.4	63.2	1.590	1.668	0.7428	
60 minute summer	SWMH 10.4	10.4	Tank 1	62.9	1.106	1.049	1.1239	

Results for 100 year +20% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 95.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWMH 11.1	59	72.791	0.791	155.5	127.8990	0.0000	SURCHARGED
60 minute summer	SWMH 11.2	60	71.809	0.009	0.2	0.0000	0.0000	OK
60 minute summer	SWMH 12.1	33	74.015	1.015	24.3	2.5264	0.0000	FLOOD RISK
60 minute summer	SWMH 13.1	36	72.902	0.282	4.1	0.3192	0.0000	SURCHARGED
60 minute summer	Tank 1	67	72.422	0.471	122.5	224.4138	0.0000	SURCHARGED
60 minute summer	Pond 1	80	72.687	0.487	213.8	423.1800	0.0000	SURCHARGED
60 minute summer	Cat 4	53	73.279	0.169	60.6	58.4633	0.0000	OK
60 minute summer	Cat 7	54	73.441	0.271	29.7	29.7114	0.0000	OK
60 minute summer	Cat 9	49	73.186	0.076	16.0	11.8645	0.0000	OK
60 minute summer	Cat 15	54	73.580	0.430	28.7	29.0544	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.407	0.003	0.0059	3.1
60 minute summer	SWMH 11.1	Infiltration		15.7				
60 minute summer	SWMH 12.1	12.1	SWMH 6.3	24.3	0.612	0.475	1.7885	
60 minute summer	SWMH 13.1	13.1	SWMH 1.4	-4.1	-0.123	-0.091	1.1927	
60 minute summer	Tank 1	Tank 1	SWMH 8.1	6.3	0.416	0.139	0.5332	
60 minute summer	Pond 1	Pond 1	SWMH 3.1	9.2	0.578	0.099	0.5024	
60 minute summer	Cat 4	Hydro-Brake®		0.1				0.6
60 minute summer	Cat 4	Infiltration		14.3				
60 minute summer	Cat 7	Hydro-Brake®		0.1				0.8
60 minute summer	Cat 7	Infiltration		6.4				
60 minute summer	Cat 9	Hydro-Brake®		0.1				0.3
60 minute summer	Cat 9	Infiltration		5.7				
60 minute summer	Cat 15	Hydro-Brake®		0.1				0.9
60 minute summer	Cat 15	Infiltration		6.0				

Results for 100 year +20% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 95.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 1.1	36	73.343	0.539	53.9	2.6501	0.0000	SURCHARGED
60 minute winter	SWMH 1.2	36	73.222	0.634	90.9	0.7165	0.0000	SURCHARGED
60 minute winter	SWMH 1.3	36	73.144	0.574	90.5	0.6489	0.0000	SURCHARGED
60 minute winter	SWMH 1.4	37	72.809	0.411	90.1	0.4643	0.0000	SURCHARGED
60 minute winter	SWMH 1.5	81	72.719	0.419	88.5	0.4742	0.0000	SURCHARGED
60 minute winter	SWMH 2.1	36	73.308	0.566	46.9	3.2802	0.0000	SURCHARGED
60 minute winter	SWMH 2.2	36	73.271	0.605	42.2	0.6838	0.0000	SURCHARGED
60 minute winter	SWMH 2.3	36	73.242	0.627	41.8	0.7090	0.0000	SURCHARGED
60 minute winter	SWMH 3.1	80	72.718	0.568	9.1	0.6427	0.0000	SURCHARGED
60 minute winter	SWMH 3.2	80	72.718	0.618	8.5	0.6986	0.0000	SURCHARGED
60 minute winter	SWMH 3.3	53	72.046	0.066	7.9	0.0741	0.0000	OK
60 minute winter	SWMH CON	53	71.884	0.064	7.9	0.0000	0.0000	OK
60 minute winter	SWMH 4.1	25	74.090	0.950	145.8	13.9546	79.7340	FLOOD
60 minute winter	SWMH 4.2	25	73.970	1.065	47.2	1.2046	0.0000	FLOOD RISK
60 minute winter	SWMH 4.3	25	73.829	1.191	47.3	1.3465	0.0000	SURCHARGED
60 minute winter	SWMH 4.4	25	73.770	1.230	47.3	1.3911	53.1461	FLOOD
60 minute winter	SWMH 4.5	27	73.770	1.270	98.6	1.4364	7.0024	FLOOD
60 minute winter	SWMH 4.6	29	73.690	1.240	95.9	1.4024	0.0419	FLOOD
60 minute winter	SWMH 4.7	29	73.550	1.210	118.5	1.3686	0.0000	FLOOD RISK
60 minute winter	SWMH 4.8	29	73.412	1.112	118.7	1.2576	0.0000	FLOOD RISK
60 minute winter	SWMH 5.1	34	73.936	0.576	39.2	2.3126	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 1.1	1.1	SWMH 1.2	49.8	0.723	0.725	3.9397	
60 minute winter	SWMH 1.2	1.2	SWMH 1.3	90.5	1.285	1.414	0.3777	
60 minute winter	SWMH 1.3	1.3	SWMH 1.4	90.1	1.279	1.313	3.1463	
60 minute winter	SWMH 1.4	1.4	SWMH 1.5	88.5	1.257	1.333	1.9125	
60 minute winter	SWMH 1.5	1.5	Pond 1	88.0	1.676	1.058	1.2504	
60 minute winter	SWMH 2.1	2.1	SWMH 2.2	42.2	0.743	0.616	1.3922	
60 minute winter	SWMH 2.2	2.2	SWMH 2.3	41.8	0.594	0.620	0.9654	
60 minute winter	SWMH 2.3	2.3	SWMH 1.2	41.5	0.589	0.644	0.5593	
60 minute winter	SWMH 3.1	3.1	SWMH 3.2	8.5	0.423	0.089	0.4727	
60 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
60 minute winter	SWMH 3.3	3.3	SWMH CON	7.9	0.706	0.102	0.3692	130.3
60 minute winter	SWMH 4.1	4.1	SWMH 4.2	47.2	0.917	0.683	4.2254	
60 minute winter	SWMH 4.2	4.2	SWMH 4.3	47.3	0.913	0.682	4.7882	
60 minute winter	SWMH 4.3	4.3	SWMH 4.4	47.3	0.690	0.659	1.6449	
60 minute winter	SWMH 4.4	4.4	SWMH 4.5	36.7	0.521	0.341	0.3005	
60 minute winter	SWMH 4.5	4.5	SWMH 4.6	95.9	1.362	1.132	0.6031	
60 minute winter	SWMH 4.6	4.6	SWMH 4.7	94.0	1.334	1.138	1.3944	
60 minute winter	SWMH 4.7	4.7	SWMH 4.8	118.7	1.686	1.437	0.5066	
60 minute winter	SWMH 4.8	4.8	Pond 1	119.3	1.922	3.056	5.5445	
60 minute winter	SWMH 5.1	5.1	SWMH 5.2	38.8	1.101	0.533	1.0433	

Results for 100 year +20% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 95.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 5.2	34	73.759	0.909	38.8	1.0286	0.0000	FLOOD RISK
60 minute winter	SWMH 5.3	30	73.600	1.064	38.8	1.2034	2.0090	FLOOD
60 minute winter	SWMH 6.1	24	74.050	0.946	209.3	19.5500	156.9955	FLOOD
60 minute winter	SWMH 6.2	33	73.963	1.131	49.5	1.2788	0.0000	FLOOD RISK
60 minute winter	SWMH 6.3	33	73.876	1.312	93.9	4.5236	0.0000	FLOOD RISK
60 minute winter	SWMH 7.1	47	73.360	1.160	144.0	101.8790	8.8776	FLOOD
60 minute winter	SWMH 7.2	50	71.708	0.008	0.3	0.0000	0.0000	OK
60 minute winter	SWMH 8.1	67	72.481	0.581	6.2	0.6566	0.0000	SURCHARGED
60 minute winter	SWMH 8.2	36	71.824	0.024	1.8	0.0000	0.0000	OK
60 minute winter	SWMH 9.1	27	73.940	1.300	165.6	16.0901	77.1208	FLOOD
60 minute winter	SWMH 9.2	46	73.500	1.050	64.7	1.1875	0.0000	SURCHARGED
60 minute winter	SWMH 9.3	46	73.241	0.891	61.4	1.0076	0.0000	SURCHARGED
60 minute winter	SWMH 9.4	46	73.143	0.833	60.3	0.9416	0.0000	SURCHARGED
60 minute winter	SWMH 9.5	48	72.614	0.614	60.3	0.6945	0.0000	SURCHARGED
60 minute winter	SWMH 10.1	36	74.045	1.385	70.2	7.5699	0.0000	FLOOD RISK
60 minute winter	SWMH 10.2	37	73.033	0.793	62.2	0.8965	0.0000	SURCHARGED
60 minute winter	SWMH 10.3	38	72.629	0.529	62.0	0.5988	0.0000	SURCHARGED
60 minute winter	SWMH 10.4	67	72.481	0.481	61.7	0.5437	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 5.2	5.2	SWMH 5.3	38.8	0.982	0.641	0.9226	
60 minute winter	SWMH 5.3	5.3	SWMH 4.7	35.4	0.917	0.614	0.3627	
60 minute winter	SWMH 6.1	6.1	SWMH 6.2	49.5	1.010	0.713	4.8671	
60 minute winter	SWMH 6.2	6.2	SWMH 6.3	48.6	0.876	0.701	4.8064	
60 minute winter	SWMH 6.3	6.3	SWMH 4.5	93.9	1.334	1.280	0.5767	
60 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.3	0.561	0.003	0.0059	3.0
60 minute winter	SWMH 7.1	Infiltration		16.5				
60 minute winter	SWMH 8.1	8.1	SWMH 8.2	1.8	0.802	0.023	0.0099	27.1
60 minute winter	SWMH 9.1	9.1	SWMH 9.2	64.7	1.627	1.593	1.2312	
60 minute winter	SWMH 9.2	9.2	SWMH 9.3	61.4	1.545	1.536	0.6674	
60 minute winter	SWMH 9.3	9.3	SWMH 9.4	60.3	1.517	1.130	0.1507	
60 minute winter	SWMH 9.4	9.4	SWMH 9.5	60.3	1.516	1.311	1.5712	
60 minute winter	SWMH 9.5	9.5	Tank 1	60.3	1.635	2.152	0.6599	
60 minute winter	SWMH 10.1	10.1	SWMH 10.2	62.2	1.565	1.477	2.5295	
60 minute winter	SWMH 10.2	10.2	SWMH 10.3	62.0	1.559	1.544	0.9279	
60 minute winter	SWMH 10.3	10.3	SWMH 10.4	61.7	1.553	1.629	0.7428	
60 minute winter	SWMH 10.4	10.4	Tank 1	61.3	1.028	1.024	1.1239	

Results for 100 year +20% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 95.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH 11.1	59	72.848	0.848	125.9	146.3180	0.0000	SURCHARGED
60 minute winter	SWMH 11.2	60	71.809	0.009	0.2	0.0000	0.0000	OK
60 minute winter	SWMH 12.1	33	73.950	0.950	19.7	2.3665	0.0000	SURCHARGED
60 minute winter	SWMH 13.1	37	72.809	0.189	1.9	0.2140	0.0000	OK
60 minute winter	Tank 1	67	72.481	0.530	119.9	252.2107	0.0000	SURCHARGED
60 minute winter	Pond 1	80	72.719	0.519	206.5	453.7480	0.0000	SURCHARGED
60 minute winter	Cat 4	56	73.290	0.180	59.6	66.3986	0.0000	OK
60 minute winter	Cat 7	57	73.460	0.290	29.2	33.7657	0.0000	OK
60 minute winter	Cat 9	52	73.192	0.082	15.8	13.4700	0.0000	OK
60 minute winter	Cat 15	58	73.610	0.460	28.2	33.0147	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.411	0.003	0.0060	3.2
60 minute winter	SWMH 11.1	Infiltration		16.5				
60 minute winter	SWMH 12.1	12.1	SWMH 6.3	19.7	0.496	0.385	1.7885	
60 minute winter	SWMH 13.1	13.1	SWMH 1.4	2.1	0.079	0.048	1.1309	
60 minute winter	Tank 1	Tank 1	SWMH 8.1	6.2	0.432	0.138	0.5332	
60 minute winter	Pond 1	Pond 1	SWMH 3.1	9.1	0.592	0.098	0.5024	
60 minute winter	Cat 4	Hydro-Brake®		0.1				0.7
60 minute winter	Cat 4	Infiltration		15.2				
60 minute winter	Cat 7	Hydro-Brake®		0.1				0.8
60 minute winter	Cat 7	Infiltration		6.8				
60 minute winter	Cat 9	Hydro-Brake®		0.1				0.3
60 minute winter	Cat 9	Infiltration		5.8				
60 minute winter	Cat 15	Hydro-Brake®		0.1				1.0
60 minute winter	Cat 15	Infiltration		6.5				

Results for 100 year +20% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 98.02%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 1.1	1320	73.405	0.601	7.6	2.9594	0.0000	SURCHARGED
1440 minute summer	SWMH 1.2	1320	73.405	0.817	13.0	0.9238	0.0000	SURCHARGED
1440 minute summer	SWMH 1.3	1350	73.404	0.834	12.3	0.9434	0.0000	SURCHARGED
1440 minute summer	SWMH 1.4	1350	73.403	1.005	12.2	1.1369	0.0000	SURCHARGED
1440 minute summer	SWMH 1.5	1350	73.403	1.103	12.1	1.2478	0.0000	SURCHARGED
1440 minute summer	SWMH 2.1	1350	73.405	0.663	6.7	3.8410	0.0000	FLOOD RISK
1440 minute summer	SWMH 2.2	1350	73.405	0.739	6.2	0.8353	0.0000	SURCHARGED
1440 minute summer	SWMH 2.3	1350	73.406	0.791	5.9	0.8942	0.0000	SURCHARGED
1440 minute summer	SWMH 3.1	1410	73.404	1.254	8.0	1.4187	0.0000	SURCHARGED
1440 minute summer	SWMH 3.2	1320	73.403	1.303	7.9	1.4734	0.0000	SURCHARGED
1440 minute summer	SWMH 3.3	660	72.046	0.066	7.9	0.0741	0.0000	OK
1440 minute summer	SWMH CON	660	71.884	0.064	7.9	0.0000	0.0000	OK
1440 minute summer	SWMH 4.1	1410	73.408	0.268	20.7	3.9346	0.0000	OK
1440 minute summer	SWMH 4.2	1350	73.408	0.503	20.6	0.5689	0.0000	SURCHARGED
1440 minute summer	SWMH 4.3	1380	73.408	0.770	19.3	0.8707	0.0000	SURCHARGED
1440 minute summer	SWMH 4.4	1410	73.409	0.869	19.2	0.9825	0.0000	SURCHARGED
1440 minute summer	SWMH 4.5	1350	73.408	0.908	53.8	1.0269	0.0000	SURCHARGED
1440 minute summer	SWMH 4.6	1380	73.407	0.957	54.0	1.0822	0.0000	FLOOD RISK
1440 minute summer	SWMH 4.7	1350	73.408	1.068	59.2	1.2077	0.0000	FLOOD RISK
1440 minute summer	SWMH 4.8	1410	73.405	1.105	59.1	1.2503	0.0000	FLOOD RISK
1440 minute summer	SWMH 5.1	1350	73.406	0.046	5.6	0.1863	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 1.1	1.1	SWMH 1.2	7.6	0.423	0.110	3.9397	
1440 minute summer	SWMH 1.2	1.2	SWMH 1.3	12.3	0.650	0.193	0.3777	
1440 minute summer	SWMH 1.3	1.3	SWMH 1.4	12.2	0.570	0.178	3.1463	
1440 minute summer	SWMH 1.4	1.4	SWMH 1.5	12.1	0.488	0.182	1.9125	
1440 minute summer	SWMH 1.5	1.5	Pond 1	12.0	0.708	0.144	1.2504	
1440 minute summer	SWMH 2.1	2.1	SWMH 2.2	6.2	0.578	0.090	1.3922	
1440 minute summer	SWMH 2.2	2.2	SWMH 2.3	5.9	0.479	0.087	0.9654	
1440 minute summer	SWMH 2.3	2.3	SWMH 1.2	5.8	0.340	0.090	0.5593	
1440 minute summer	SWMH 3.1	3.1	SWMH 3.2	7.9	0.230	0.083	0.4727	
1440 minute summer	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
1440 minute summer	SWMH 3.3	3.3	SWMH CON	7.9	0.706	0.102	0.3692	643.2
1440 minute summer	SWMH 4.1	4.1	SWMH 4.2	20.6	0.818	0.297	4.1046	
1440 minute summer	SWMH 4.2	4.2	SWMH 4.3	19.3	0.744	0.279	4.7882	
1440 minute summer	SWMH 4.3	4.3	SWMH 4.4	19.2	0.624	0.267	1.6449	
1440 minute summer	SWMH 4.4	4.4	SWMH 4.5	19.0	0.415	0.177	0.3005	
1440 minute summer	SWMH 4.5	4.5	SWMH 4.6	54.0	0.972	0.638	0.6031	
1440 minute summer	SWMH 4.6	4.6	SWMH 4.7	53.9	0.765	0.652	1.3944	
1440 minute summer	SWMH 4.7	4.7	SWMH 4.8	59.1	0.840	0.715	0.5066	
1440 minute summer	SWMH 4.8	4.8	Pond 1	59.0	0.870	1.512	5.5445	
1440 minute summer	SWMH 5.1	5.1	SWMH 5.2	5.6	0.920	0.077	0.5989	

Results for 100 year +20% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 98.02%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 5.2	1410	73.406	0.556	5.6	0.6293	0.0000	SURCHARGED
1440 minute summer	SWMH 5.3	1410	73.406	0.870	5.4	0.9843	0.0000	FLOOD RISK
1440 minute summer	SWMH 6.1	780	73.441	0.337	29.7	6.9550	0.0000	SURCHARGED
1440 minute summer	SWMH 6.2	1380	73.408	0.576	27.9	0.6519	0.0000	SURCHARGED
1440 minute summer	SWMH 6.3	1350	73.407	0.843	35.8	2.9070	0.0000	SURCHARGED
1440 minute summer	SWMH 7.1	810	73.217	1.017	20.4	79.8750	0.0000	FLOOD RISK
1440 minute summer	SWMH 7.2	810	71.708	0.008	0.2	0.0000	0.0000	OK
1440 minute summer	SWMH 8.1	1440	73.210	1.310	5.1	1.4815	0.0000	FLOOD RISK
1440 minute summer	SWMH 8.2	1440	71.825	0.025	2.1	0.0000	0.0000	OK
1440 minute summer	SWMH 9.1	1440	73.212	0.572	23.5	7.0849	0.0000	SURCHARGED
1440 minute summer	SWMH 9.2	1440	73.211	0.761	22.7	0.8608	0.0000	SURCHARGED
1440 minute summer	SWMH 9.3	1440	73.212	0.862	22.6	0.9744	0.0000	SURCHARGED
1440 minute summer	SWMH 9.4	1440	73.211	0.901	22.5	1.0196	0.0000	SURCHARGED
1440 minute summer	SWMH 9.5	1440	73.210	1.210	22.4	1.3688	0.0000	SURCHARGED
1440 minute summer	SWMH 10.1	1440	73.211	0.551	10.0	3.0099	0.0000	SURCHARGED
1440 minute summer	SWMH 10.2	1440	73.210	0.970	10.0	1.0975	0.0000	SURCHARGED
1440 minute summer	SWMH 10.3	1440	73.210	1.110	9.7	1.2557	0.0000	SURCHARGED
1440 minute summer	SWMH 10.4	1440	73.210	1.210	9.7	1.3687	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 5.2	5.2	SWMH 5.3	5.4	0.748	0.089	0.9226	
1440 minute summer	SWMH 5.3	5.3	SWMH 4.7	5.3	0.589	0.092	0.3627	
1440 minute summer	SWMH 6.1	6.1	SWMH 6.2	27.9	0.858	0.402	4.8671	
1440 minute summer	SWMH 6.2	6.2	SWMH 6.3	27.8	0.680	0.402	4.8064	
1440 minute summer	SWMH 6.3	6.3	SWMH 4.5	35.4	0.803	0.482	0.5767	
1440 minute summer	SWMH 7.1	7.1	SWMH 7.2	0.2	0.552	0.002	0.0057	10.7
1440 minute summer	SWMH 7.1	Infiltration		14.4				
1440 minute summer	SWMH 8.1	8.1	SWMH 8.2	2.1	0.836	0.027	0.0110	168.6
1440 minute summer	SWMH 9.1	9.1	SWMH 9.2	22.7	0.944	0.558	1.2312	
1440 minute summer	SWMH 9.2	9.2	SWMH 9.3	22.6	0.897	0.565	0.6674	
1440 minute summer	SWMH 9.3	9.3	SWMH 9.4	22.5	0.962	0.422	0.1507	
1440 minute summer	SWMH 9.4	9.4	SWMH 9.5	22.4	0.564	0.488	1.5712	
1440 minute summer	SWMH 9.5	9.5	Tank 1	22.4	0.768	0.798	0.6599	
1440 minute summer	SWMH 10.1	10.1	SWMH 10.2	10.0	0.722	0.237	2.5295	
1440 minute summer	SWMH 10.2	10.2	SWMH 10.3	9.7	0.535	0.242	0.9279	
1440 minute summer	SWMH 10.3	10.3	SWMH 10.4	9.7	0.395	0.255	0.7428	
1440 minute summer	SWMH 10.4	10.4	Tank 1	9.6	0.341	0.160	1.1239	

Results for 100 year +20% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 98.02%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SWMH 11.1	810	72.608	0.608	17.9	77.0358	0.0000	SURCHARGED
1440 minute summer	SWMH 11.2	810	71.809	0.009	0.2	0.0000	0.0000	OK
1440 minute summer	SWMH 12.1	1350	73.408	0.408	2.8	1.0165	0.0000	SURCHARGED
1440 minute summer	SWMH 13.1	1290	73.404	0.784	0.2	0.8862	0.0000	SURCHARGED
1440 minute summer	Tank 1	1440	73.210	1.259	32.0	599.5289	0.0000	SURCHARGED
1440 minute summer	Pond 1	1380	73.403	1.203	71.0	1168.1630	0.0000	FLOOD RISK
1440 minute summer	Cat 4	780	73.208	0.098	9.7	20.0694	0.0000	OK
1440 minute summer	Cat 7	780	73.337	0.167	4.8	11.6863	0.0000	OK
1440 minute summer	Cat 9	750	73.139	0.029	2.6	1.7852	0.0000	OK
1440 minute summer	Cat 15	780	73.419	0.269	4.6	11.9987	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	SWMH 11.1	11.1	SWMH 11.2	0.2	0.395	0.003	0.0054	13.2
1440 minute summer	SWMH 11.1	Infiltration		12.0				
1440 minute summer	SWMH 12.1	12.1	SWMH 6.3	2.6	0.135	0.051	1.7885	
1440 minute summer	SWMH 13.1	13.1	SWMH 1.4	-0.2	-0.007	-0.005	1.1927	
1440 minute summer	Tank 1	Tank 1	SWMH 8.1	5.1	0.250	0.114	0.5332	
1440 minute summer	Pond 1	Pond 1	SWMH 3.1	8.0	0.447	0.086	0.5024	
1440 minute summer	Cat 4	Hydro-Brake®		0.1				3.0
1440 minute summer	Cat 4	Infiltration		8.2				
1440 minute summer	Cat 7	Hydro-Brake®		0.1				4.0
1440 minute summer	Cat 7	Infiltration		3.9				
1440 minute summer	Cat 9	Hydro-Brake®		0.0				1.1
1440 minute summer	Cat 9	Infiltration		2.5				
1440 minute summer	Cat 15	Hydro-Brake®		0.1				4.9
1440 minute summer	Cat 15	Infiltration		3.7				

Results for 100 year +20% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 1.1	1410	73.578	0.774	5.8	3.8067	0.0000	SURCHARGED
1440 minute winter	SWMH 1.2	1410	73.580	0.992	9.9	1.1215	0.0000	SURCHARGED
1440 minute winter	SWMH 1.3	1380	73.575	1.005	9.7	1.1364	0.0000	SURCHARGED
1440 minute winter	SWMH 1.4	1410	73.576	1.178	9.6	1.3318	0.0000	SURCHARGED
1440 minute winter	SWMH 1.5	1380	73.575	1.275	9.5	1.4416	0.0000	FLOOD RISK
1440 minute winter	SWMH 2.1	1410	73.577	0.835	5.0	4.8359	0.0000	FLOOD RISK
1440 minute winter	SWMH 2.2	1410	73.577	0.911	4.7	1.0302	0.0000	FLOOD RISK
1440 minute winter	SWMH 2.3	1350	73.575	0.960	4.6	1.0862	0.0000	SURCHARGED
1440 minute winter	SWMH 3.1	1410	73.574	1.424	8.0	1.6103	0.0000	FLOOD RISK
1440 minute winter	SWMH 3.2	1380	73.574	1.474	8.0	1.6667	0.0000	FLOOD RISK
1440 minute winter	SWMH 3.3	600	72.046	0.066	7.9	0.0741	0.0000	OK
1440 minute winter	SWMH CON	600	71.884	0.064	7.9	0.0000	0.0000	OK
1440 minute winter	SWMH 4.1	1380	73.580	0.440	15.6	6.4661	0.0000	SURCHARGED
1440 minute winter	SWMH 4.2	1380	73.580	0.675	15.6	0.7632	0.0000	SURCHARGED
1440 minute winter	SWMH 4.3	1380	73.580	0.942	14.6	1.0649	0.0000	SURCHARGED
1440 minute winter	SWMH 4.4	1380	73.579	1.039	14.6	1.1755	0.0000	FLOOD RISK
1440 minute winter	SWMH 4.5	1380	73.579	1.079	41.8	1.2209	0.0000	FLOOD RISK
1440 minute winter	SWMH 4.6	1380	73.579	1.129	41.6	1.2767	0.0000	FLOOD RISK
1440 minute winter	SWMH 4.7	1380	73.579	1.239	45.5	1.4008	0.0000	FLOOD RISK
1440 minute winter	SWMH 4.8	1380	73.578	1.278	45.4	1.4450	0.0000	FLOOD RISK
1440 minute winter	SWMH 5.1	1380	73.579	0.219	4.2	0.8773	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 1.1	1.1	SWMH 1.2	5.5	0.397	0.080	3.9397	
1440 minute winter	SWMH 1.2	1.2	SWMH 1.3	9.7	0.615	0.151	0.3777	
1440 minute winter	SWMH 1.3	1.3	SWMH 1.4	9.6	0.556	0.140	3.1463	
1440 minute winter	SWMH 1.4	1.4	SWMH 1.5	9.5	0.497	0.143	1.9125	
1440 minute winter	SWMH 1.5	1.5	Pond 1	9.5	0.681	0.114	1.2504	
1440 minute winter	SWMH 2.1	2.1	SWMH 2.2	4.7	0.535	0.068	1.3922	
1440 minute winter	SWMH 2.2	2.2	SWMH 2.3	4.6	0.467	0.069	0.9654	
1440 minute winter	SWMH 2.3	2.3	SWMH 1.2	4.6	0.332	0.071	0.5593	
1440 minute winter	SWMH 3.1	3.1	SWMH 3.2	8.0	0.171	0.084	0.4727	
1440 minute winter	SWMH 3.2	3.2	SWMH 3.3	7.9	0.699	0.100	0.2647	
1440 minute winter	SWMH 3.3	3.3	SWMH CON	7.9	0.706	0.102	0.3692	669.8
1440 minute winter	SWMH 4.1	4.1	SWMH 4.2	15.6	0.775	0.225	4.2254	
1440 minute winter	SWMH 4.2	4.2	SWMH 4.3	14.6	0.721	0.211	4.7882	
1440 minute winter	SWMH 4.3	4.3	SWMH 4.4	14.6	0.626	0.203	1.6449	
1440 minute winter	SWMH 4.4	4.4	SWMH 4.5	14.6	0.420	0.136	0.3005	
1440 minute winter	SWMH 4.5	4.5	SWMH 4.6	41.6	0.949	0.491	0.6031	
1440 minute winter	SWMH 4.6	4.6	SWMH 4.7	41.5	0.744	0.503	1.3944	
1440 minute winter	SWMH 4.7	4.7	SWMH 4.8	45.4	0.645	0.550	0.5066	
1440 minute winter	SWMH 4.8	4.8	Pond 1	45.4	0.773	1.162	5.5445	
1440 minute winter	SWMH 5.1	5.1	SWMH 5.2	4.2	0.893	0.058	1.0388	

Results for 100 year +20% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 5.2	1380	73.578	0.728	4.2	0.8236	0.0000	SURCHARGED
1440 minute winter	SWMH 5.3	1380	73.578	1.042	4.1	1.1786	0.0000	FLOOD RISK
1440 minute winter	SWMH 6.1	1350	73.581	0.477	22.3	9.8558	0.0000	SURCHARGED
1440 minute winter	SWMH 6.2	1350	73.580	0.748	22.3	0.8460	0.0000	SURCHARGED
1440 minute winter	SWMH 6.3	1380	73.580	1.016	27.6	3.5006	0.0000	SURCHARGED
1440 minute winter	SWMH 7.1	840	73.122	0.922	15.4	66.7147	0.0000	FLOOD RISK
1440 minute winter	SWMH 7.2	840	71.708	0.008	0.2	0.0000	0.0000	OK
1440 minute winter	SWMH 8.1	1410	73.390	1.490	4.8	1.6854	0.0000	FLOOD RISK
1440 minute winter	SWMH 8.2	1410	71.826	0.026	2.2	0.0000	0.0000	OK
1440 minute winter	SWMH 9.1	1410	73.394	0.754	17.7	9.3357	0.0000	SURCHARGED
1440 minute winter	SWMH 9.2	1410	73.395	0.945	17.1	1.0683	0.0000	SURCHARGED
1440 minute winter	SWMH 9.3	1410	73.398	1.048	17.0	1.1853	0.0000	SURCHARGED
1440 minute winter	SWMH 9.4	1440	73.389	1.079	17.0	1.2204	0.0000	SURCHARGED
1440 minute winter	SWMH 9.5	1410	73.390	1.390	16.9	1.5717	0.0000	SURCHARGED
1440 minute winter	SWMH 10.1	1410	73.391	0.731	7.5	3.9947	0.0000	SURCHARGED
1440 minute winter	SWMH 10.2	1410	73.391	1.151	7.5	1.3013	0.0000	SURCHARGED
1440 minute winter	SWMH 10.3	1410	73.391	1.291	7.3	1.4596	0.0000	SURCHARGED
1440 minute winter	SWMH 10.4	1410	73.391	1.391	7.2	1.5727	0.0000	SURCHARGED

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 5.2	5.2	SWMH 5.3	4.1	0.739	0.068	0.9226	
1440 minute winter	SWMH 5.3	5.3	SWMH 4.7	4.0	0.589	0.070	0.3627	
1440 minute winter	SWMH 6.1	6.1	SWMH 6.2	22.3	0.838	0.321	4.8671	
1440 minute winter	SWMH 6.2	6.2	SWMH 6.3	21.9	0.675	0.316	4.8064	
1440 minute winter	SWMH 6.3	6.3	SWMH 4.5	27.2	0.794	0.371	0.5767	
1440 minute winter	SWMH 7.1	7.1	SWMH 7.2	0.2	0.546	0.002	0.0055	11.5
1440 minute winter	SWMH 7.1	Infiltration		13.0				
1440 minute winter	SWMH 8.1	8.1	SWMH 8.2	2.2	0.850	0.028	0.0114	176.1
1440 minute winter	SWMH 9.1	9.1	SWMH 9.2	17.1	0.899	0.421	1.2312	
1440 minute winter	SWMH 9.2	9.2	SWMH 9.3	17.0	0.875	0.426	0.6674	
1440 minute winter	SWMH 9.3	9.3	SWMH 9.4	17.0	0.937	0.318	0.1507	
1440 minute winter	SWMH 9.4	9.4	SWMH 9.5	16.9	0.560	0.368	1.5712	
1440 minute winter	SWMH 9.5	9.5	Tank 1	16.9	0.738	0.602	0.6599	
1440 minute winter	SWMH 10.1	10.1	SWMH 10.2	7.5	0.682	0.178	2.5295	
1440 minute winter	SWMH 10.2	10.2	SWMH 10.3	7.3	0.545	0.181	0.9279	
1440 minute winter	SWMH 10.3	10.3	SWMH 10.4	7.2	0.427	0.191	0.7428	
1440 minute winter	SWMH 10.4	10.4	Tank 1	7.2	0.356	0.120	1.1239	

Results for 100 year +20% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	SWMH 11.1	840	72.559	0.559	13.4	65.5827	0.0000	SURCHARGED
1440 minute winter	SWMH 11.2	840	71.809	0.009	0.2	0.0000	0.0000	OK
1440 minute winter	SWMH 12.1	1380	73.580	0.580	2.1	1.4432	0.0000	SURCHARGED
1440 minute winter	SWMH 13.1	1380	73.576	0.956	0.2	1.0815	0.0000	SURCHARGED
1440 minute winter	Tank 1	1410	73.391	1.440	23.8	685.4142	0.0000	SURCHARGED
1440 minute winter	Pond 1	1380	73.574	1.374	54.5	1367.2770	0.0000	FLOOD RISK
1440 minute winter	Cat 4	780	73.192	0.082	7.3	14.1473	0.0000	OK
1440 minute winter	Cat 7	780	73.311	0.141	3.6	8.4159	0.0000	OK
1440 minute winter	Cat 9	780	73.132	0.022	1.9	1.0291	0.0000	OK
1440 minute winter	Cat 15	780	73.381	0.231	3.5	9.0315	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	SWMH 11.1	11.1	SWMH 11.2	0.2	0.391	0.003	0.0053	13.1
1440 minute winter	SWMH 11.1	Infiltration		11.0				
1440 minute winter	SWMH 12.1	12.1	SWMH 6.3	2.0	0.131	0.039	1.7885	
1440 minute winter	SWMH 13.1	13.1	SWMH 1.4	-0.2	-0.006	-0.005	1.1927	
1440 minute winter	Tank 1	Tank 1	SWMH 8.1	4.8	0.216	0.108	0.5332	
1440 minute winter	Pond 1	Pond 1	SWMH 3.1	8.0	0.419	0.086	0.5024	
1440 minute winter	Cat 4	Hydro-Brake®		0.1				3.5
1440 minute winter	Cat 4	Infiltration		6.9				
1440 minute winter	Cat 7	Hydro-Brake®		0.1				4.2
1440 minute winter	Cat 7	Infiltration		3.3				
1440 minute winter	Cat 9	Hydro-Brake®		0.0				1.3
1440 minute winter	Cat 9	Infiltration		1.9				
1440 minute winter	Cat 15	Hydro-Brake®		0.1				5.0
1440 minute winter	Cat 15	Infiltration		3.2				

PINNACLE
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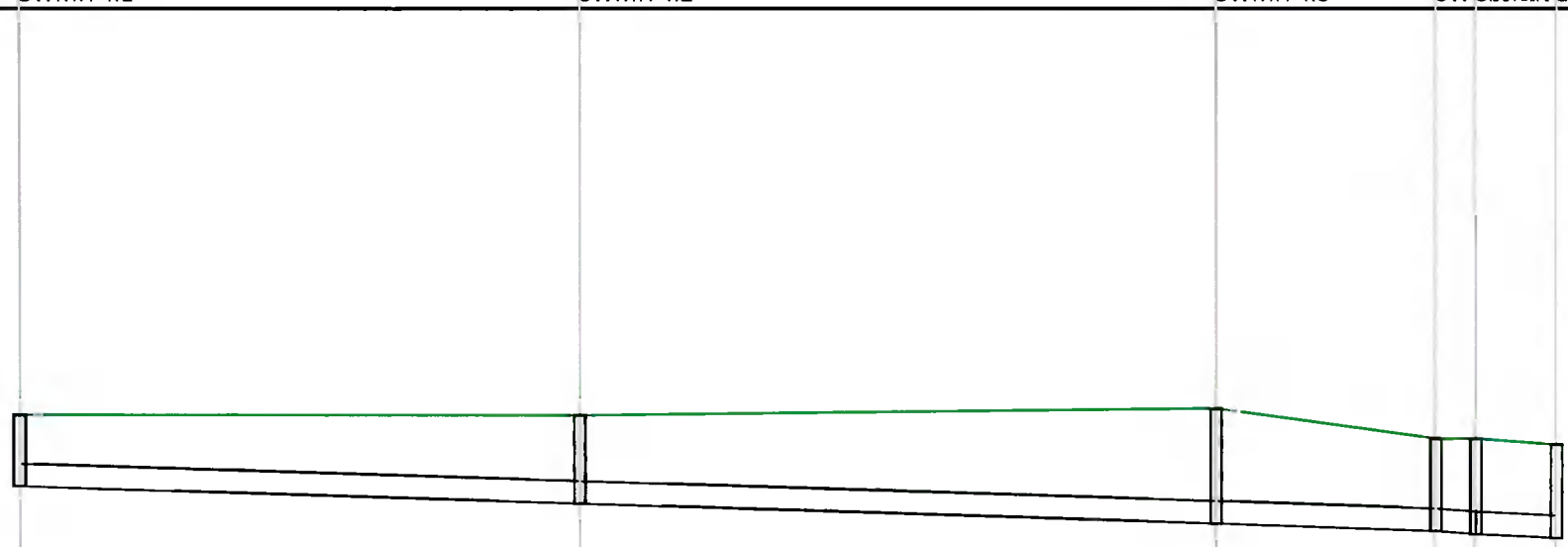
File: Apollo Hydraulic Model.pfd
Network: Storm Network
Francois Jansen van Rensburg
16/08/2021

Apollo Hydraulic Model
Rev 1

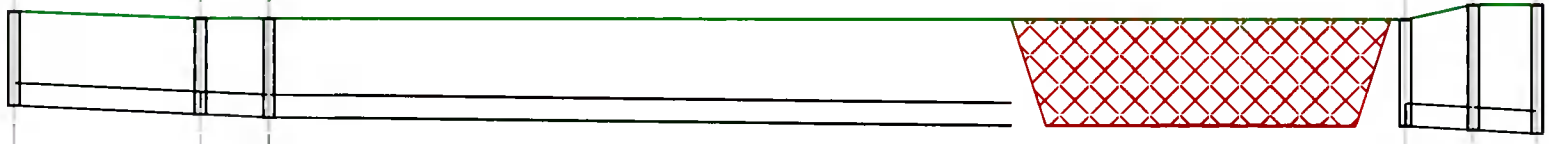


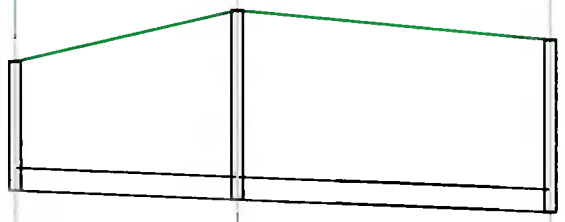
A4 drawing

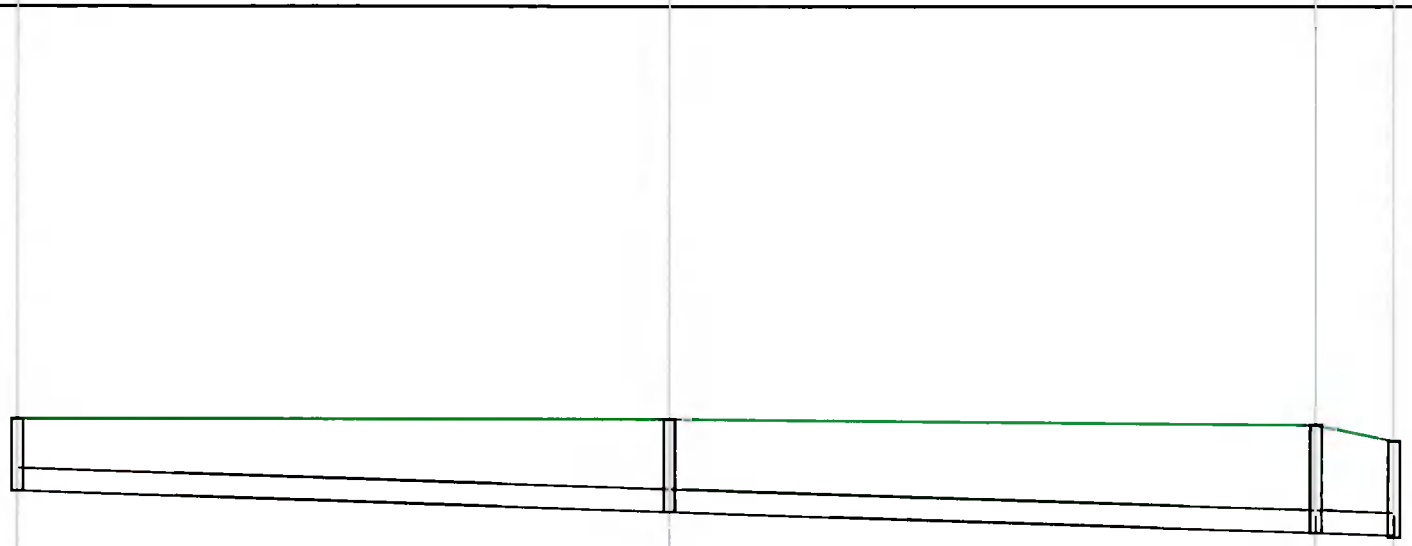
Hor Scale 800
Ver Scale 100

Datum (m) 68.000

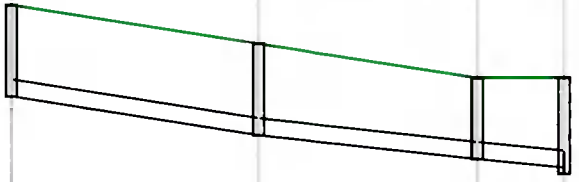
Node Name	SWMH 4.1	SWMH 4.2	SWMH 4.3	SWMH 4.4	SWMH 4.5	SWMH 4.6
Link Name	4.1	4.2	4.3	4.4	4.5	
Section Type	300mm	300mm	300mm	300mm	300mm	
Slope (1:X)	255.3	254.7	238.4	106	171.3	
Cover Level (m)	74.090	74.080	74.170	73.770	73.770	73.690
Invert Level (m)	73.140	72.905 / 72.905	72.638 / 72.638	72.540	72.500	72.450
Length (m)	60.004	67.996	23.359	4.2	8.564	

Node Name	SWMH 4.6	SWMH 4.7	SWMH 4.8				Pond	SWMH 3.1	SWMH 3.2
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000									
Link Name	4.6	4.7	4.8				Pond	3.1	
Section Type	300mm	300mm	300mm				300mm	300mm	
Slope (1:X)	180.0	179.9	787.4				142.7	134.2	
Cover Level (m)	73.690	73.600	73.600				73.600	73.800	73.800
Invert Level (m)	72.450	72.340	72.340	72.300	72.300	72.200	72.200	72.150	72.150	72.100
Length (m)	19.801	7.194	78.736				7.135	6.712	

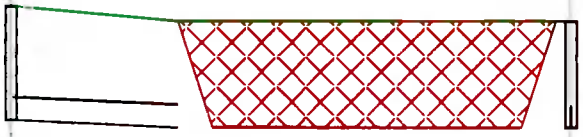
Node Name		SWMH 3.2	SWMH 3.3	SWMH CON
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000				
Link Name		3.2	3.3	
Section Type		300mm	300mm	
Slope (1:X)		195.5	206.4	
Cover Level (m)		73.800	74.480	74.090
Invert Level (m)		72.100 / 71.980	71.980 / 71.820	
Length (m)		23.460	33.031	

Node Name	SWMH 6.1	SWMH 6.2	SWMH 6.3	SWMH 4.5
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 68.000				
Link Name	6.1	6.2	6.3	
Section Type	300mm	300mm	300mm	
Slope (1:X)	254.1	254.7	227.5	
Cover Level (m)	74.050	74.050	73.980	73.770
Invert Level (m)	73.104	72.832 / 72.832	72.564 / 72.564	72.528
Length (m)	69.116	68.254	8.190	

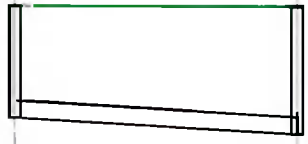
Node Name		SWMH 12.1	SWMH 6.3
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 68.000			
Link Name		12.1	
Section Type		225mm	
Slope (1:X)		103.1	
Cover Level (m)		74.280	73.980
Invert Level (m)		73.000	72.564
Length (m)		44.970	

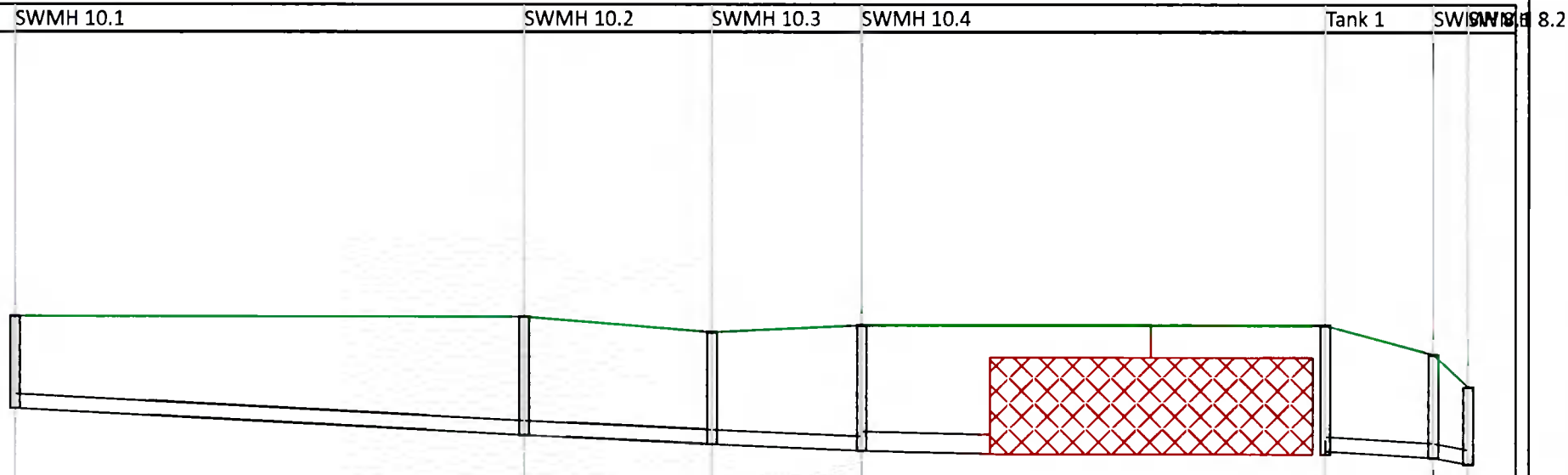
Node Name		SWMH 5.1	SWMH 5.2	SWMH 5.3	SWMH 4.7
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 68.000					
Link Name		5.1	5.2	5.3	
Section Type		225mm	225mm	225mm	
Slope (1:X)		51.4	73.9	81.4	
Cover Level (m)		74.560	74.050	73.600	73.600
Invert Level (m)		73.360	72.850 / 72.850	72.536 / 72.536	72.424
Length (m)		26.232	23.198	9.119	

Node Name	SWMH 1.1	SWMH 1.2	SWMH 1.3	SWMH 1.4	SWMH 1.5
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000					
Link Name	1.1	1.2	1.3	1.4	
Section Type	300mm	300r	300mm	300mm	
Slope (1:X)	259.0	297.	259.8	277.1	
Cover Level (m)	74.060	74.060	74.070	74.080	73.800
Invert Level (m)	72.804	72.588	72.570	72.398	72.300
Length (m)	55.947	5.36	44.680	27.159	

Node Name		SWMH 1.5	Pond 1
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000			
Link Name		1.5	
Section Type		300mm	
Slope (1:X)		177.6	
Cover Level (m)		73.800	73.600
Invert Level (m)		72.300	72.200
Length (m)		17.757	

Node Name		SWMH 2.1	SWMH 2.2	SWMH 2.3	SWMH 1.2
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 68.000					
Link Name		2.1	2.2	2.3	
Section Type		300mm	300mm	300mn	
Slope (1:X)		260.1	268.8	294.1	
Cover Level (m)		73.630	73.830	73.880	74.060
Invert Level (m)		72.742	72.666 / 72.666	72.615 / 72.615	72.588
Length (m)		19.770	13.710	7.942	

Node Name		SWMH 13.1	SWMH 1.4
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000			
Link Name		13.1	
Section Type		225mm	
Slope (1:X)		135.1	
Cover Level (m)		74.090	74.080
Invert Level (m)		72.620	72.398
Length (m)		29.988	

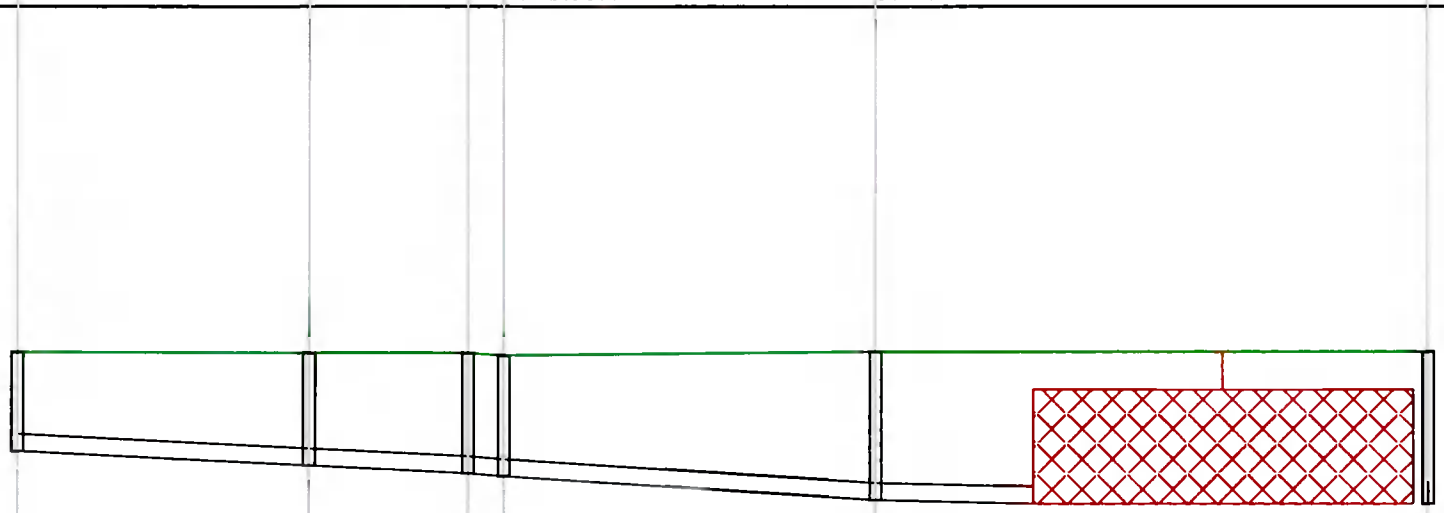


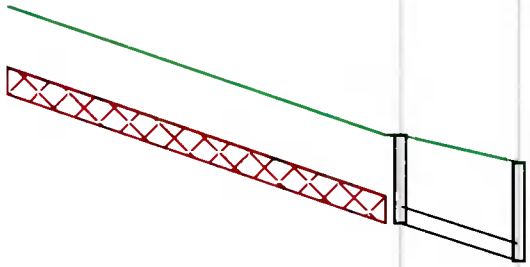
A4 drawing

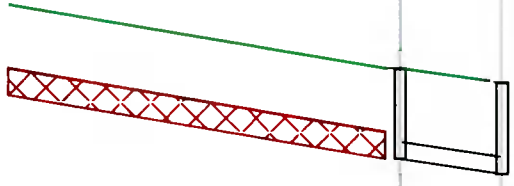
Hor Scale 800
Ver Scale 100

Datum (m) 67.000

Node Name	SWMH 10.1		SWMH 10.2		SWMH 10.3	SWMH 10.4		Tank 1	SWMH 8.1	SWMH 8.2
Link Name	10.1		10.2		10.3	10.4		Tank 1	8.1	
Section Type	225mm		225mm		225mm	300mm		225mm	225	
Slope (1:X)	151.4		166.7		186.8	339.6		134.1	43.3	
Cover Level (m)	74.090		74.080		73.840	73.950		73.950	73.500	73.000
Invert Level (m)	72.660	72.240	72.240	72.100	72.100	72.000	71.953	72.000	71.900	71.800
Length (m)	63.601		23.331		18.677	15.960		13.407	4.33	

Node Name	SWMH 9.1	SWMH 9.2	SWMH 9.3	SWMH 9.4	SWMH 9.5	Tank 1
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000						
Link Name	9.1	9.2	9.3	9.4	9.5	
Section Type	225mm	225mm	225	225mm	225mm	
Slope (1:X)	162.9	167.8	94.	127.4	338.6	
Cover Level (m)	73.940	73.930	73.930	73.900	73.950	73.950
Invert Level (m)	72.640 / 72.450	72.450 / 72.350	72.350 / 72.310	72.310	72.000 / 72.000	71.951
Length (m)	30.956	16.782	3.7	39.506	16.592	

Node Name		SWMH 7.1	SWMH 7.2
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000			
Link Name		7.1	
Section Type		225mm	
Slope (1:X)		25.1	
Cover Level (m)		73.360	73.000
Invert Level (m)		72.200	71.700
Length (m)		12.535	

Node Name		SWMH 11.1	SWMH 11.2
A4 drawing Hor Scale 800 Ver Scale 100 Datum (m) 67.000			
Link Name		11.1	
Section Type		225mm	
Slope (1:X)		53.7	
Cover Level (m)		73.190	73.000
Invert Level (m)		72.000	71.800
Length (m)		10.746	

Appendix C

Stormtech Details

StormTech®

a product of ADS Europe

Product Catalogue

Not intended for design layouts; refer to the appropriate "StormTech Design Manual" for specific chamber design information.

StormTech Subsurface Stomwater Management

Table of Contents

StormTech has well over ten thousand chamber systems in service throughout the world. All StormTech chambers are designed to meet the most stringent industry performance standards for superior structural integrity. The StormTech system is designed primarily to be used under car parks, roadways and heavy earth loads saving valuable land and protecting water resources for commercial and municipal applications. In our continuing desire to answer designers' challenges, StormTech has expanded the family of products providing engineers, developers, regulators and contractors with additional site specific flexibility.

Advanced Structural Performance for Greater Long-Term Reliability

StormTech developed a state of the art chamber design through:

- Collaboration with world-renowned experts of buried drainage structures to develop and evaluate the structural testing program and product design
- Designing chambers to meet and exceed various European standards for both dynamic and long-term static loads.
- Subjecting the chambers to rigorous full-scale, third party testing, under severe loading conditions to verify their performance both under dynamic loads as well as long term static loads.

Our Chambers Provide...

- Extremely *efficient transportation.* Stacking of the chambers results in lower cost per m^3 installed volume while being more eco-friendly.
- A *remarkably quick installation.* For example: Ten of the MC-3500 chambers, providing a total installed storage of over 55 m^3, can be easily installed in 10 minutes. When installing the same 55 m^3 using box type systems you would need to install 125 to 250 boxes, taking significantly more time!
- The *strength* of concrete tanks, but at a very competitive price.
- A robust, *continuous, true elliptical arch design* which effectively transfers loads into the surrounding backfill providing the long-term safety factor required by various local standards. This offers developers a cost-effective underground system that will perform as designed for decades.
- A *design in accordance with various local European design specifications* providing engineers with a structural performance standard for live and long-term dead loads.
- Innovative *polypropylene and polyethylene* resins which have been tested using international standards to ensure long and short-term structural properties.
- Uniform wall thickness and repeatable quality due to *injection mold production.*
- Third party *tested and patented Isolator® Row* for less frequent maintenance, water quality, and long-term performance.
- *Traditional manifold/header designs* using conventional hydraulic equations that can easily verify flow equalization and scour velocity.
- *Open chamber design* requiring only one chamber model to construct each row assuring ease of construction and no repeating end walls to obstruct access or flow.

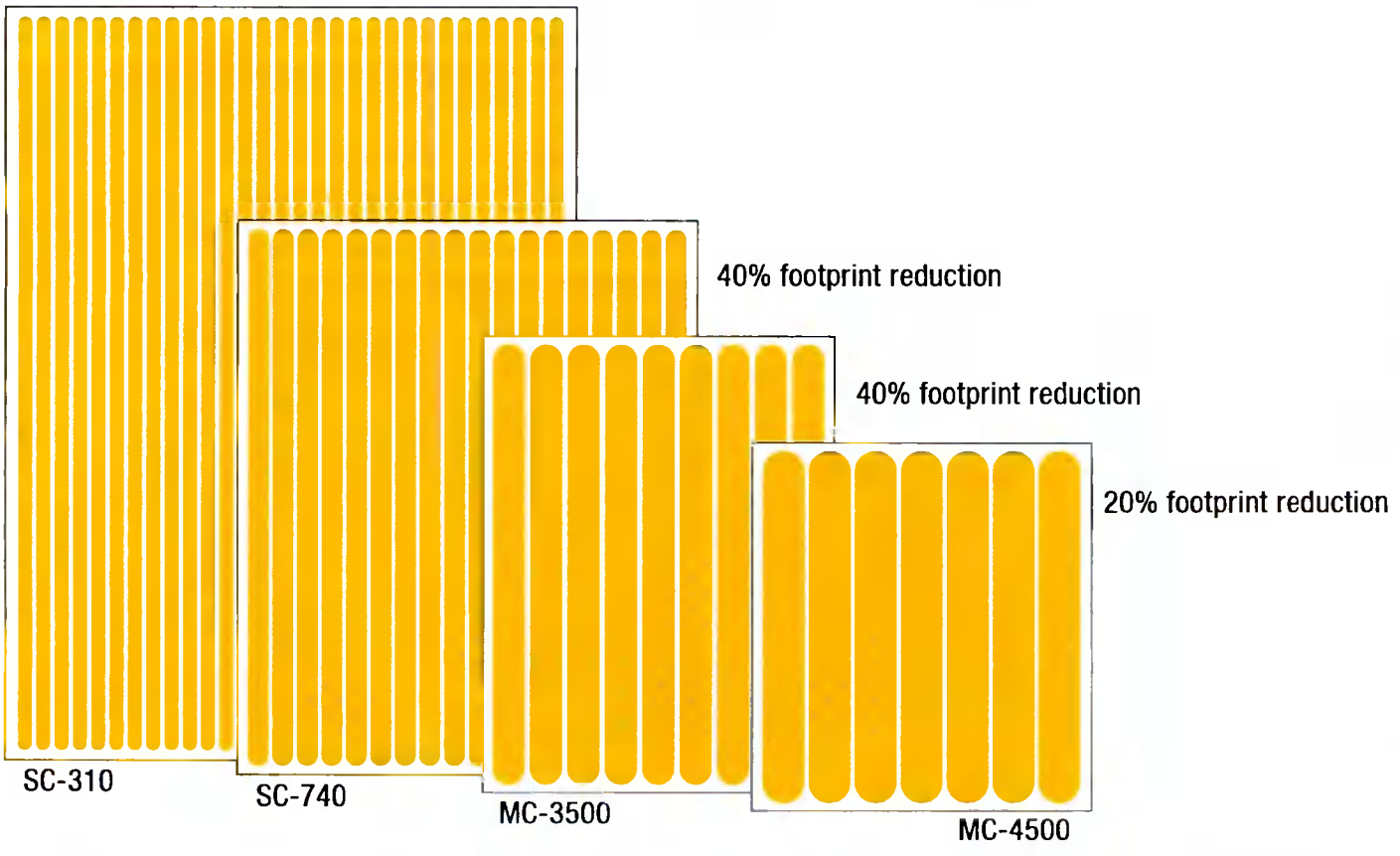
StormTech offers a variety of chamber sizes (SC-310, SC-740, DC-780, MC-3500 and MC-4500) so the consulting design engineer can choose the chamber that is best suited for the site conditions and regulatory requirements. StormTech has well over ten thousand chamber systems in service worldwide. We provide plan layout and cost estimate services at no charge for consulting engineers and developers.

StormTech Specifications and Product Comparison

PRODUCT SPECIFICATIONS	SC-310	SC-740	DC-780	MC-3500	MC-4500
Height, mm	405	760	760	1140	1525
Width, mm	865	1295	1295	1955	2540
Length, mm	2300	2300	2300	2285	1320
Installed Length, mm	2170	2170	2170	2185	1230
Bare Chamber Storage, m^3	0.42	1.30	1.30	3.11	3.01
Stone above, mm	150	150	150	300	300
Foundation Stone, mm*	150	150	230	230	230
Row Spacing, mm	150	150	150	150	230
Minimum Installed Storage, m^3	**0.88**	**2.12**	**2.22**	**5.06**	**4.60**
Storage Per Unit Area, m^3	0.39	0.67	0.70	1.06	1.35

**Please refer to the design manual.*

Example: Footprint Comparison - 1000m^3 Project



StormTech BREEAM® Credits

List of BREEAM Credits that StormTech may contribute toward:

LAND USE AND ECOLOGY

- **Credit LE3 Ecological Value of Site and Protection of Ecological Features**
  Utilizing StormTech System beneath roadways, surface parking, walkways, etc. may reduce overall site disturbance.
- **Credit LE4 Mitigating Ecological Impact**
  Utilizing StormTech System beneath roadways, surface parking, walkways, etc. may reduce overall site disturbance.

WATER

- **Credit Wat 5 Water Recycling**
  Utilize StormTech System to store captured rainwater to reduce potable water demand.
- **Credit Wat 6 Irrigation Systems**
  Utilize StormTech System to store captured rainwater for landscape irrigation.

MATERIALS

- **Credit Wst 2 Recycled Aggregates**
  Utilize recycled concrete as the backfill material for the StormTech System.

POLLUTION

- **Credit Pol 5 Flood Risk**
  Utilize StormTech System to reduce the impact of flooding on buildings with a medium-to-high risk of flooding.
- **Credit Pol 6 Minimizing Water Course Pollution**
  Utilize StormTech System to reduce potential for silt, heavy metals, chemicals or oil pollution to natural watercourses from surface water run-off from buildings and hard surfaces.

INNOVATION

- **Credit Inn 1 Innovation**
  Utilize StormTech System to substantially exceed a performance credit.

MANAGEMENT

- **Credit Man 11 Ease of Maintenance**
  Utilize StormTech System to meet this performance credit which is to recognize and encourage the specification of a building and building services that can be easily maintained during their lifecycle.

StormTech LEED® Credits

List of LEED Credits that StormTech may contribute toward:

SUSTAINABLE SITES

- **SS Credit 5.1 Site Development: Protect or Restore Habitat**
  Utilizing StormTech System beneath roadways, surface parking, walkways, etc. may reduce overall site disturbance.
- **SS Credit 5.2 Site Development: Maximize Open Space**
  Utilizing StormTech System can increase overall open space and may reduce overall site disturbance.
- **SS Credit 6.1 Stormwater Design: Quantity Control**
  Design StormTech System per local or LEED stormwater quantity requirements, whichever is more stringent.
- **SS Credit 6.2 Stormwater Design: Quality Control**
  Use of Isolator Row provides sediment removal, and can also promote infiltration and groundwater recharge.
- **SS Credit 7.1 Heat Island Effect: Non-Roof**
  Use of StormTech System may eliminate need for above ground detention ponds, thus reducing thermal impacts of stormwater runoff.

WATER EFFICIENCY

- **WE Credit 1 Water Efficient Landscaping**
  Utilize StormTech System to store captured rainwater for landscape irrigation.
- **WE Credit 2 Innovative Water Technologies**
  Utilize StormTech System to store captured rainwater to reduce potable water demand.
- **WE Credit 3 Water Use Reduction**
  Utilize StormTech System to store captured rainwater and allow reuse for non-potable applications.

MATERIALS

- **MR Credit 4 Recycled Content**
  Utilize recycled concrete as the backfill material for the StormTech System.
- **MR Credit 5 Regional Materials**
  Stone backfill material for the StormTech System will apply if extracted within 500 miles of project site.

INNOVATION & DESIGN

- **ID Credit 1 Innovation in Design**
  Utilize StormTech System to substantially exceed a performance credit.

StormTech SC-310 Chamber Specifications

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech SC-310 system is designed primarily to be used under car parks thus maximizing land usage for commercial and municipal applications.

StormTech SC-310 Chamber (not to scale)

Nominal Chamber Specifications

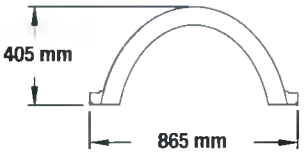
Size (L x W x H)	2170 x 865 x 405 mm
Chamber Storage	0.42 m³
Min. Installed Storage*	0.88 m³
Weight	17.5 kg

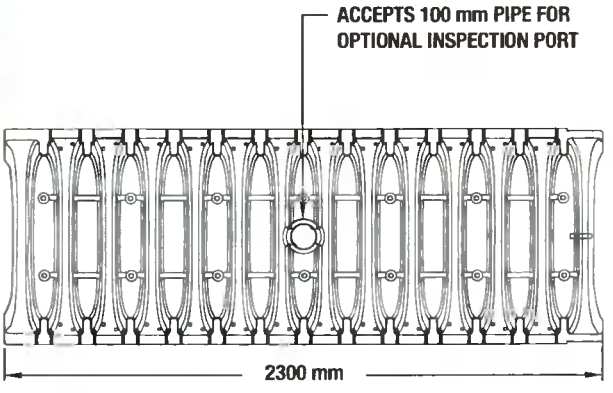
**Assumes 150 mm stone above, below and between chambers and 40% stone porosity.*

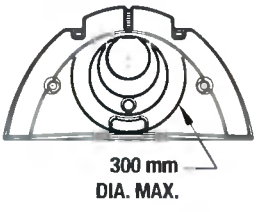
Transportation:

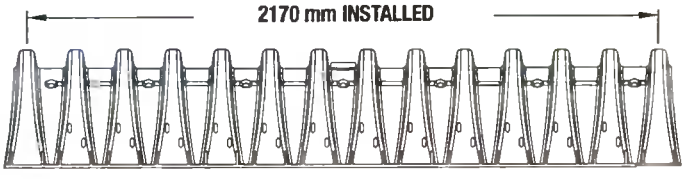
656 chambers per truck

(over 580 m³ storage per truck)

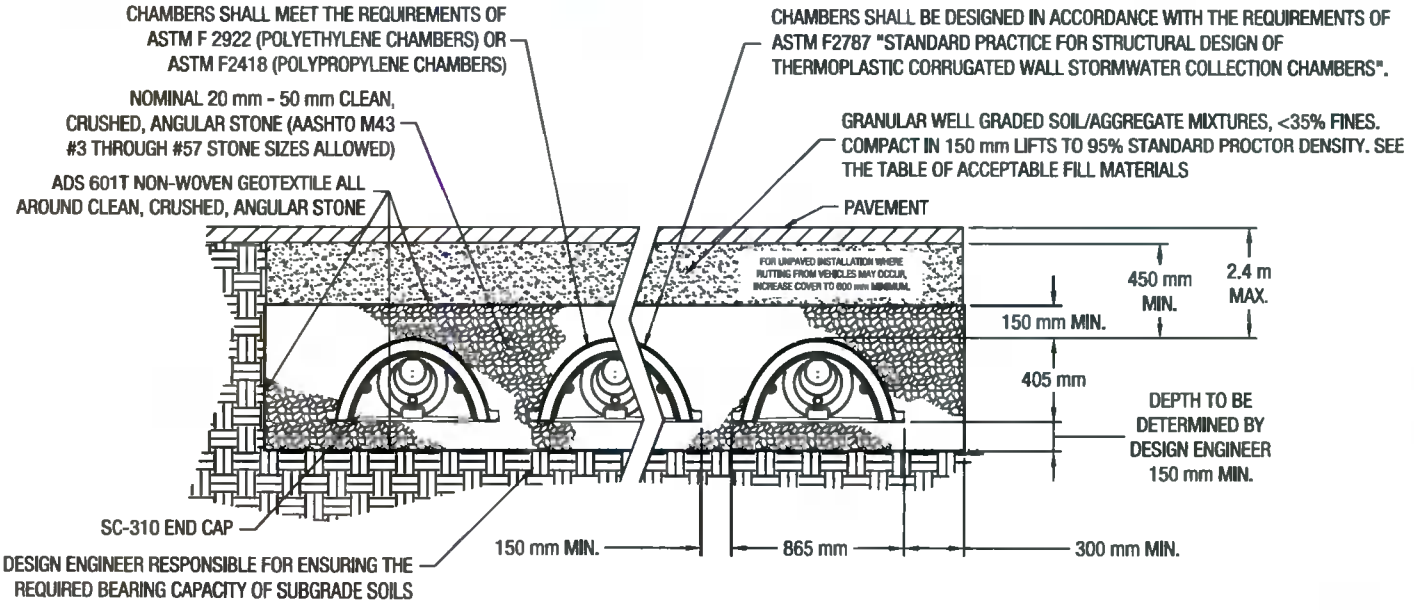








StormTech SC-310 Chamber Specifications



THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS.

StormTech SC-740 Chamber Specifications

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech SC-740 system is designed primarily to be used under car parks thus maximizing land usage for commercial and municipal applications.

StormTech SC-740 Chamber (not to scale)

Nominal Chamber Specifications

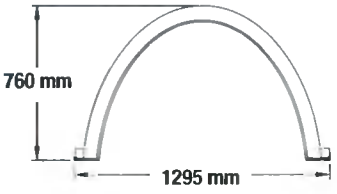
Size (L x W x H)	2170 x 1295 x 760 mm
Chamber Storage	1.30 m³
Min. Installed Storage*	2.12 m³
Weight	35.5 kg

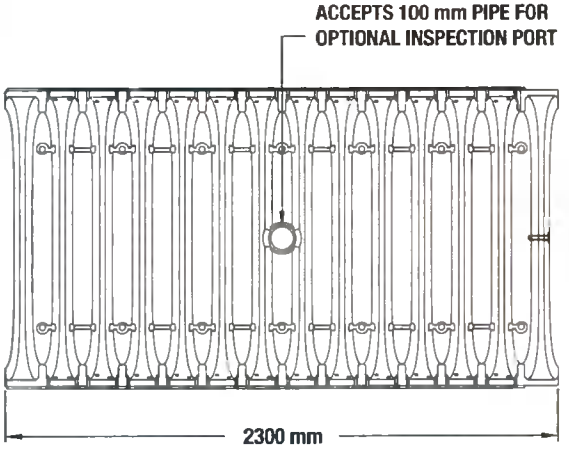
**Assumes 150 mm stone above, below and between chambers and 40% stone porosity.*

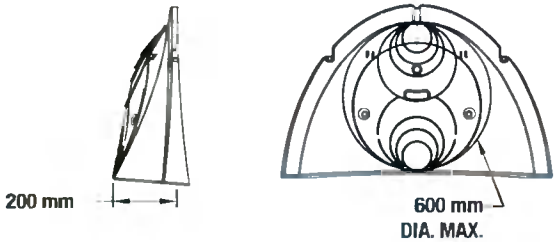
Transportation:

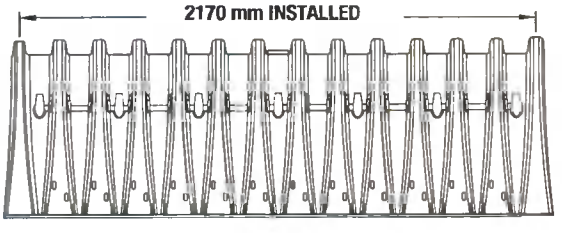
300 chambers per truck

(635 m³ storage per truck)

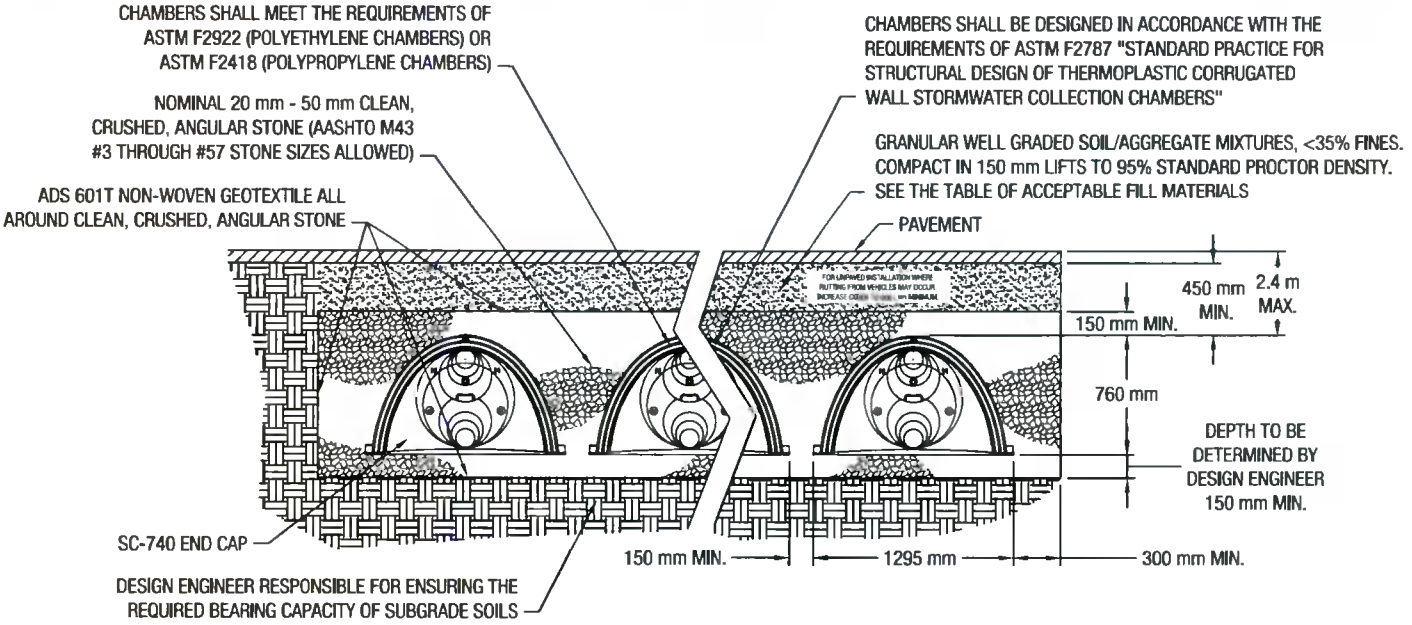








StormTech SC-740 Chamber Specifications



THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS

StormTech DC-780 Chamber Specifications

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech DC-780 system is designed specifically to be used for deep cover applications thus maximizing land usage for commercial and municipal applications.

- 3.7 m Deep Cover applications

StormTech DC-780 Chamber (not to scale)

Nominal Chamber Specifications

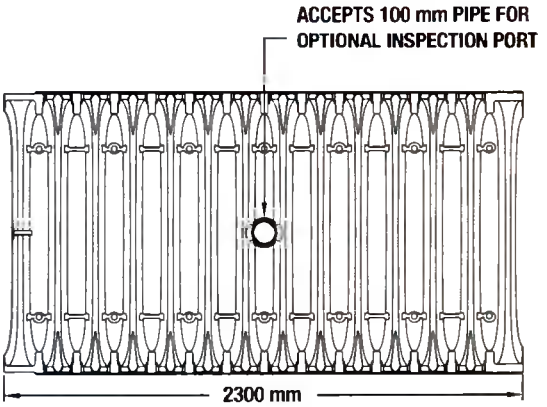
Size (L x W x H)	2170 x 1295 x 760 mm
Chamber Storage	1.30 m^3
Min. Installed Storage*	2.20 m^3

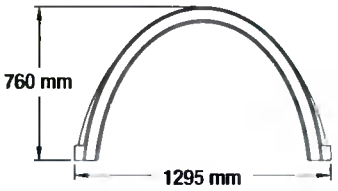
**Assumes 230 mm stone below, 150 mm stone above, and 150 mm row-spacing chambers and 40% stone porosity.*

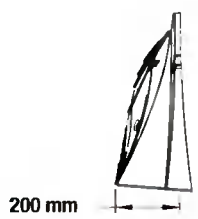
Transportation:

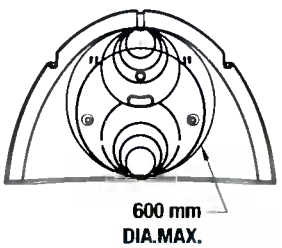
240 chambers per truck

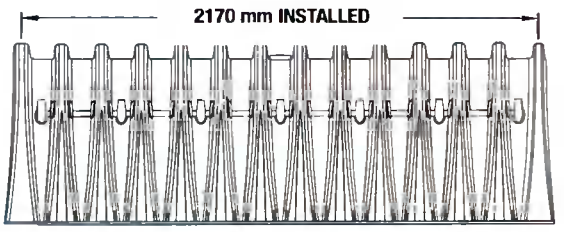
(530 m^3 storage per truck)



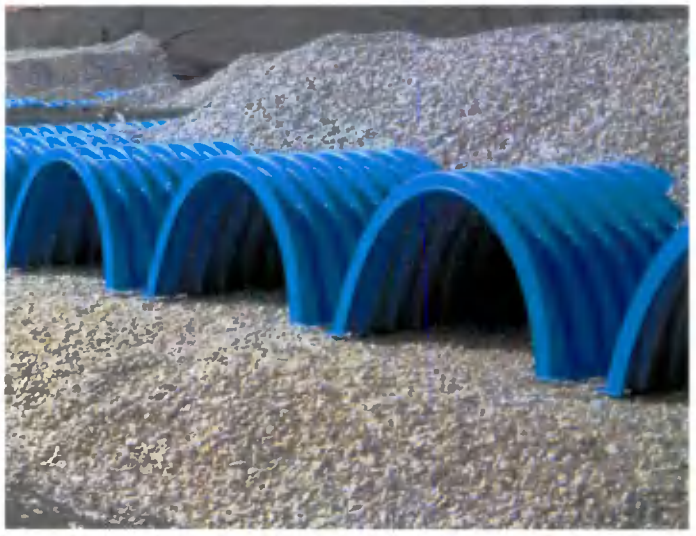


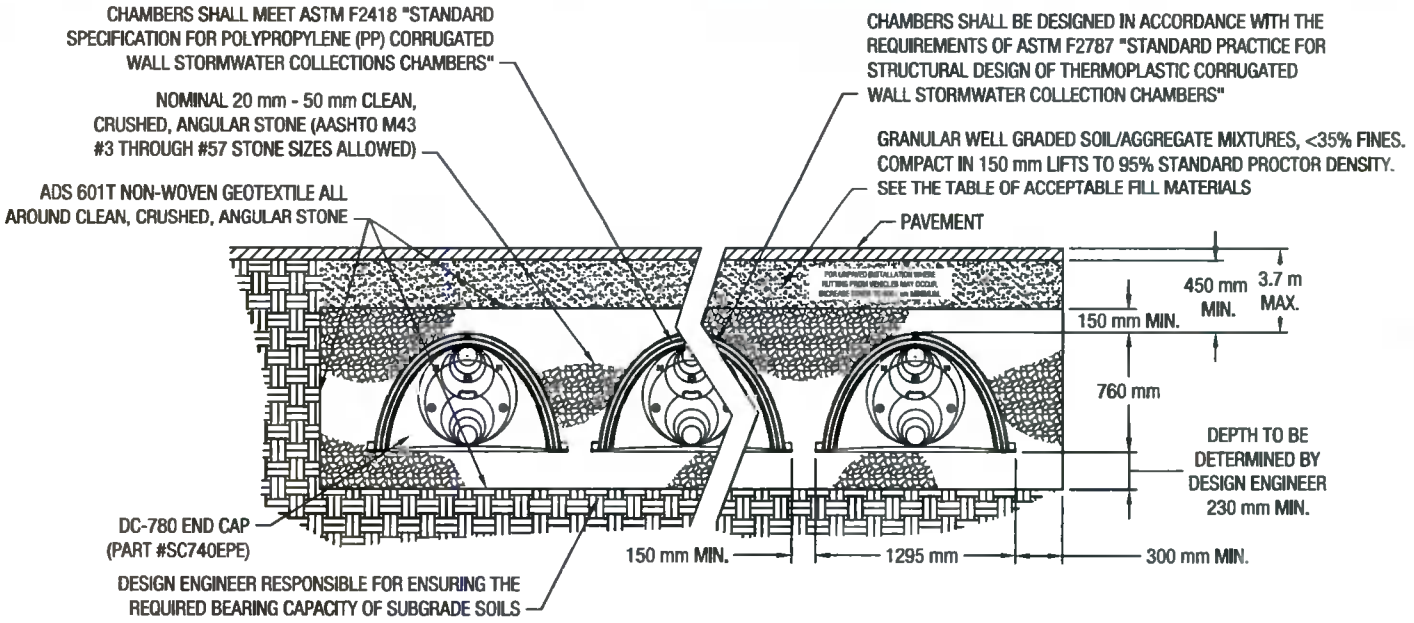






StormTech DC-780 Chamber Specifications





THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS

StormTech MC-3500 Chamber Specifications

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech MC-3500 system is designed primarily to be used under car parks thus maximizing land usage for commercial and municipal applications.

StormTech MC-3500 Chamber (not to scale)

Nominal Chamber Specifications

Size (L x W x H)	2285 x 1955 x 1145 mm
Chamber Storage	3.11 m^3
Min. Installed Storage*	5.06 m^3
Weight	56.5 kg

**Assumes a minimum of 305 mm of stone above, 230 mm of stone below, chambers, 230 mm of stone between chambers/end caps, and 40% stone porosity.*

StormTech MC-3500 End Cap (not to scale)

Nominal End Cap Specifications

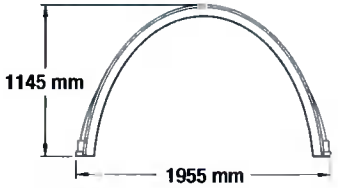
Size (L x W x H)	675 x 1805 x 1145 mm
End Cap Storage	0.44 m^3
Min. Installed Storage*	1.33 m^3
Weight	19.5 kg

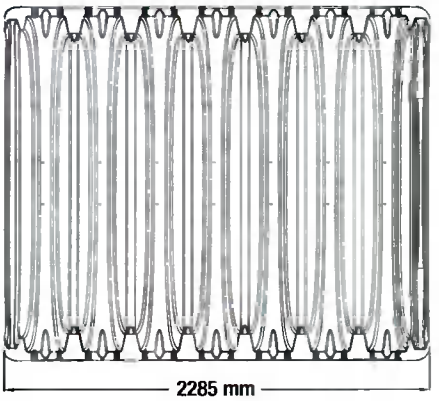
**Assumes a minimum of 305 mm stone above, 230 mm stone below, 150 mm stone perimeter, 230 mm of stone between chambers/end caps, and 40% stone porosity.*

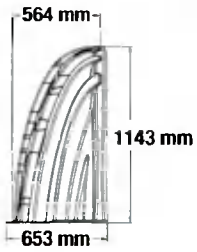
Transportation:

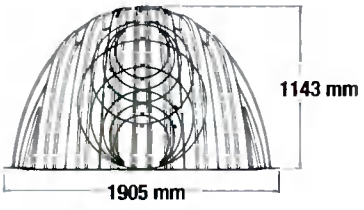
135 chambers per truck

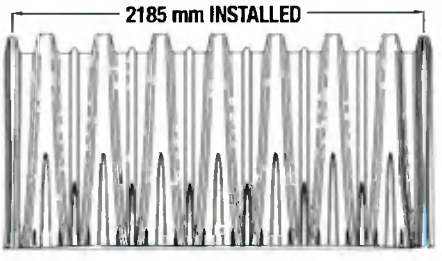
(over 685 m^3 storage per truck)



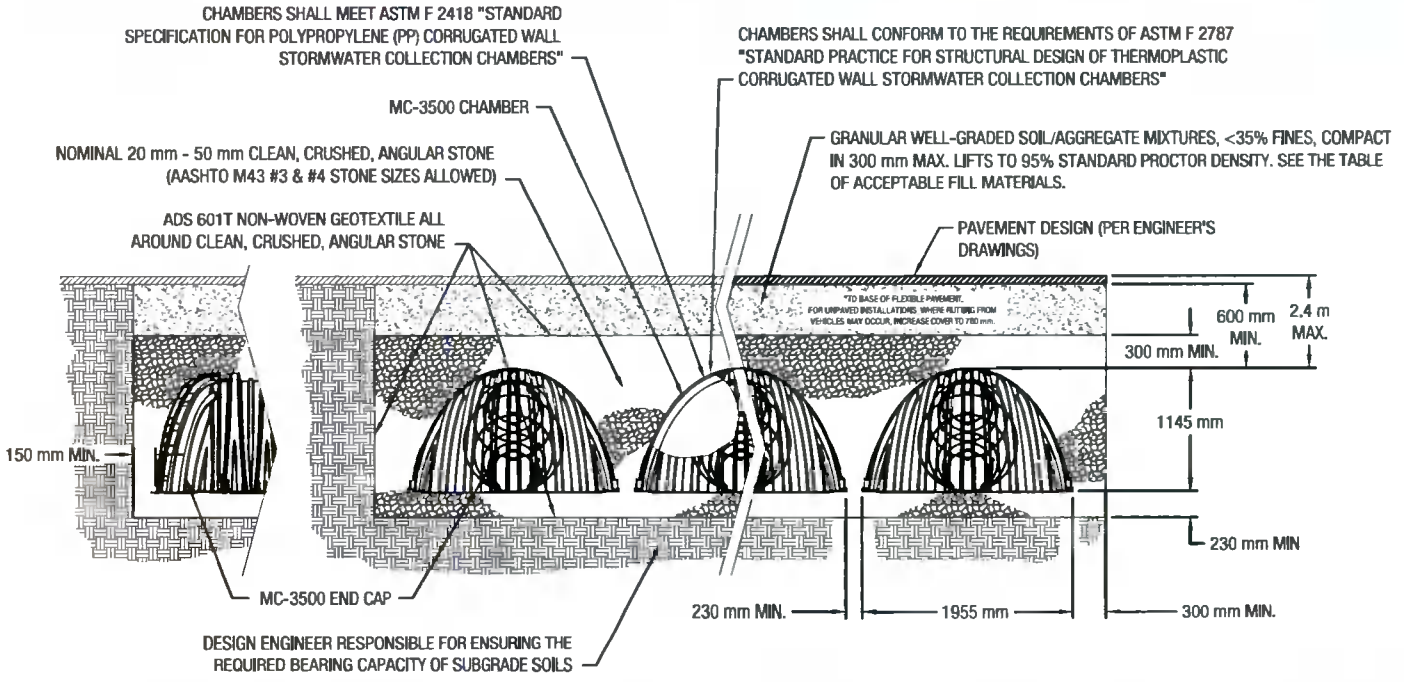






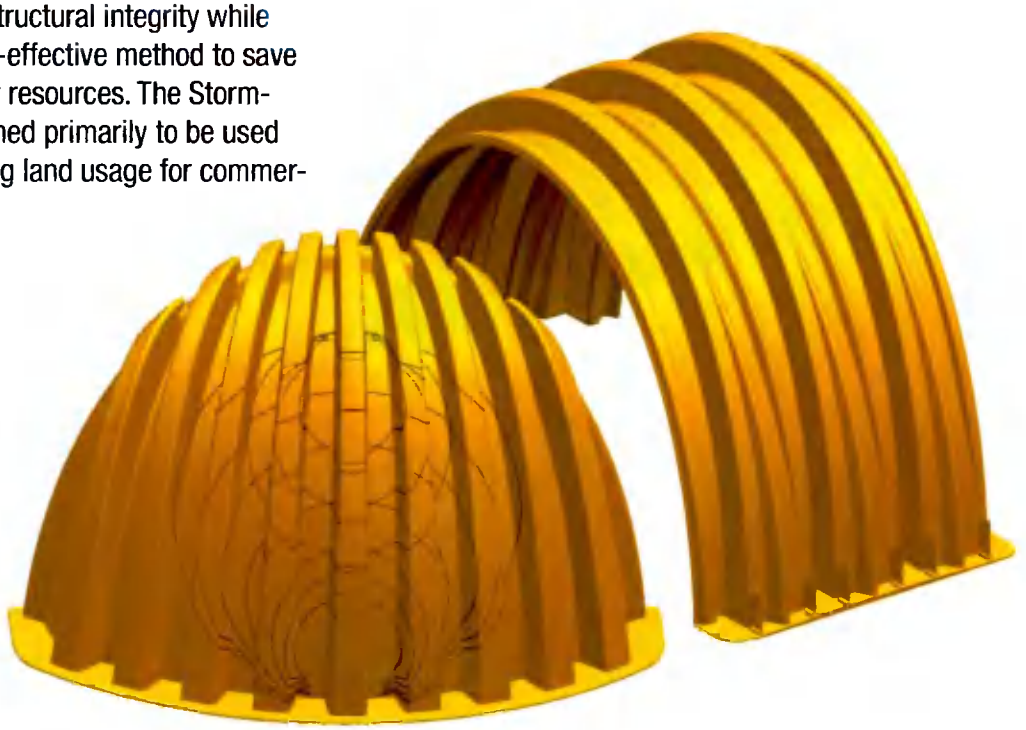


StormTech MC-3500 Chamber Specifications



StormTech MC-4500 Chamber Specifications

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech MC-4500 system is designed primarily to be used under car parks thus maximizing land usage for commercial and municipal applications.



StormTech MC-4500 Chamber (not to scale)

Nominal Chamber Specifications

Size (L x W x H)	1320 x 2540 x 1525 mm
Chamber Storage	3.01 m^3
Min. Installed Storage*	4.60 m^3
Nominal Weight	53.5 kg

**Assumes a minimum of 300 mm of stone above, 230 mm of stone below chambers, 230 mm of stone between chambers/end caps, and 40% stone porosity.*

StormTech MC-4500 End Cap (not to scale)

Nominal End Cap Specifications

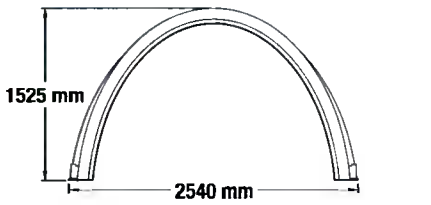
Size (L x W x H)	890 x 2290 x 1510 mm
End Cap Storage	1.01 m^3
Min. Installed Storage*	3.08 m^3
Nominal Weight	53.5 kg

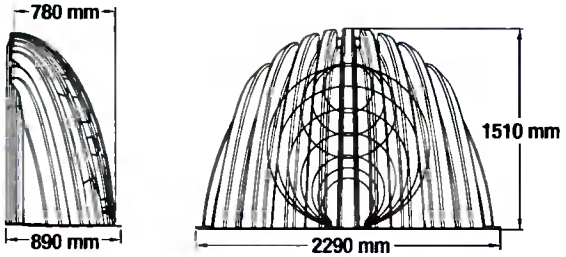
**Assumes a minimum of 300 mm of stone above, 230 mm of stone below, 305 mm of stone perimeter, 230 mm of stone between chambers/end caps, and 40% stone porosity.*

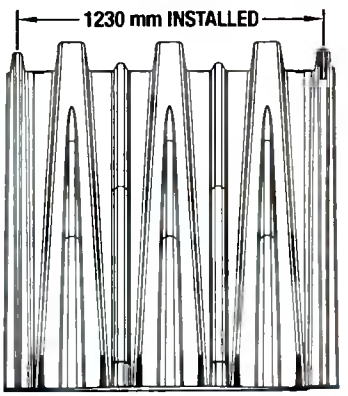
Transportation:

84 chambers per truck

(over 385 m^3 storage per truck)







StormTech MC-4500 Chamber Specifications

CHAMBERS SHALL MEET ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS."

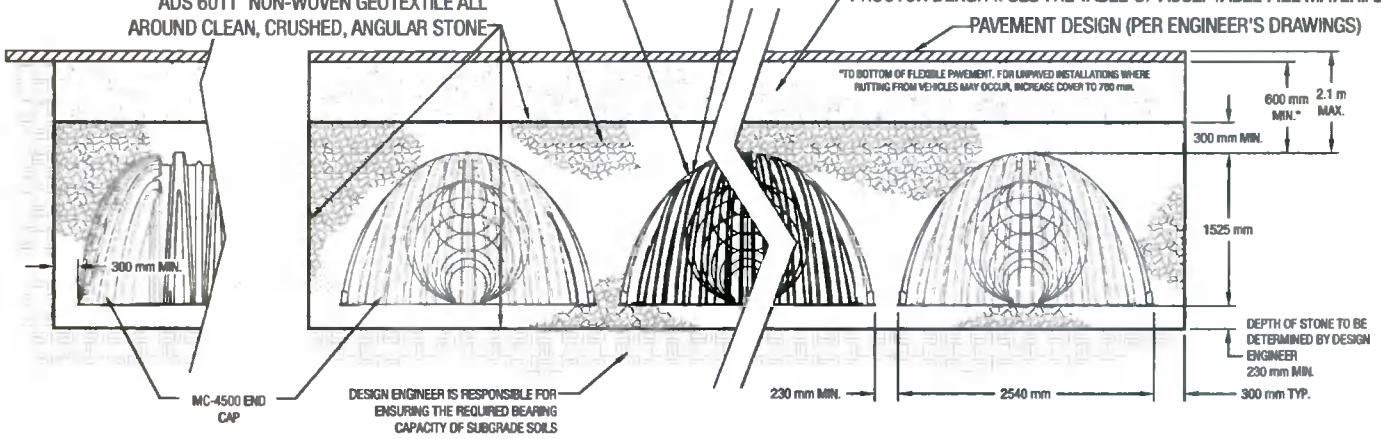
NOMINAL 20 mm - 50 mm CLEAN, CRUSHED, ANGULAR STONE (AASHTO M43 #3 & #4 STONE SIZES ALLOWED)

ADS 601T NON-WOVEN GEOTEXTILE ALL AROUND CLEAN, CRUSHED, ANGULAR STONE

CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLAXTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS."

GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES, COMPACT IN 300 mm MAX. LIFTS TO 95% STANDARD PROCTOR DENSITY. SEE THE TABLE OF ACCEPTABLE FILL MATERIALS.

PAVEMENT DESIGN (PER ENGINEER'S DRAWINGS)



THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS, WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.

StormTech Isolator® Row

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a patented technique to inexpensively improve stormwater quality and provide easy access for inspection and maintenance. By using the StormTech Isolator Row a TSS removal of 80%, a hydrocarbon (diesel) removal of 90%, a total Zinc removal of 53% and a total Phosphorus removal of 49% can be achieved.*

The Isolator Row is a row of StormTech chambers that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as stormwater rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row, protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for stormwater filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the "first flush" and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row, but typically includes a high flow weir such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row crest the weir and discharge through a manifold to the other chambers.

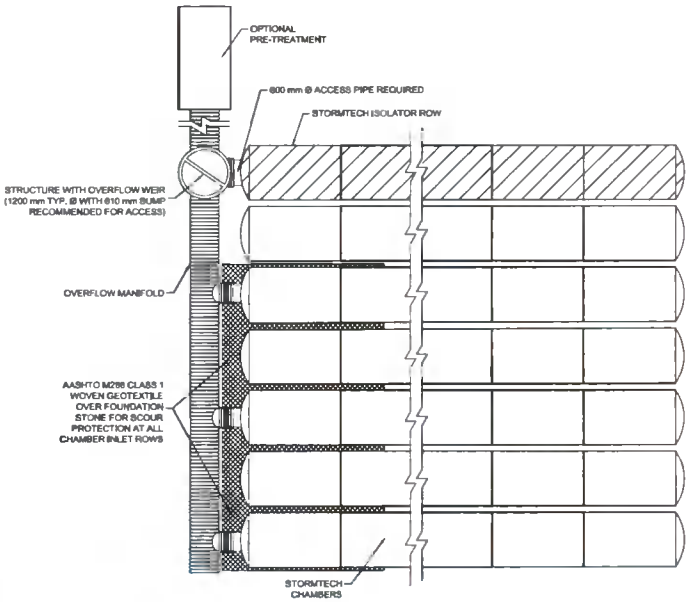
The Isolator Row may also be part of a treatment train. By treating stormwater prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins and oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

*Based on independent university testing.

StormTech Isolator Row with Overflow Spillway

(not to scale)



StormTech Isolator Row

Inspection

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If, upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 8 cm throughout the length of the Isolator Row, clean-out should be performed.

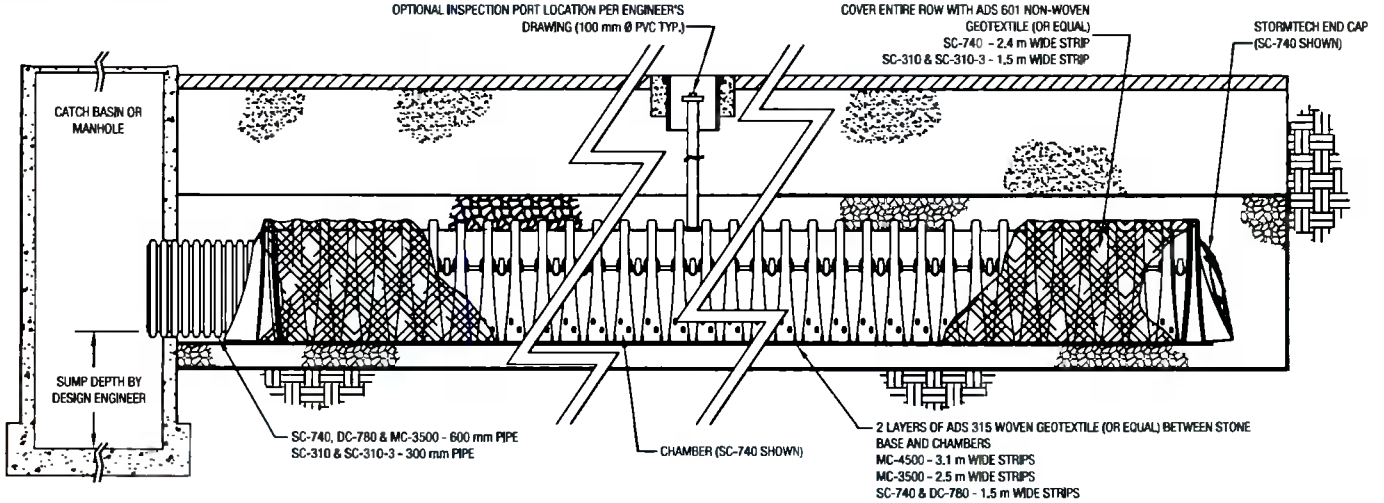
Maintenance

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s)

of the row for cleanout. If entry into the manhole is required, please follow the applicable rules and regulations for a confined space entries.

Maintenance is accomplished by jetting the Isolator Row. The jetting process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/jetting combination vehicles. Selection of an appropriate jetting nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45° are best. Most jetting reels have 120 meters of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The jetting process shall only be performed on StormTech Isolator Rows that have the correct woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

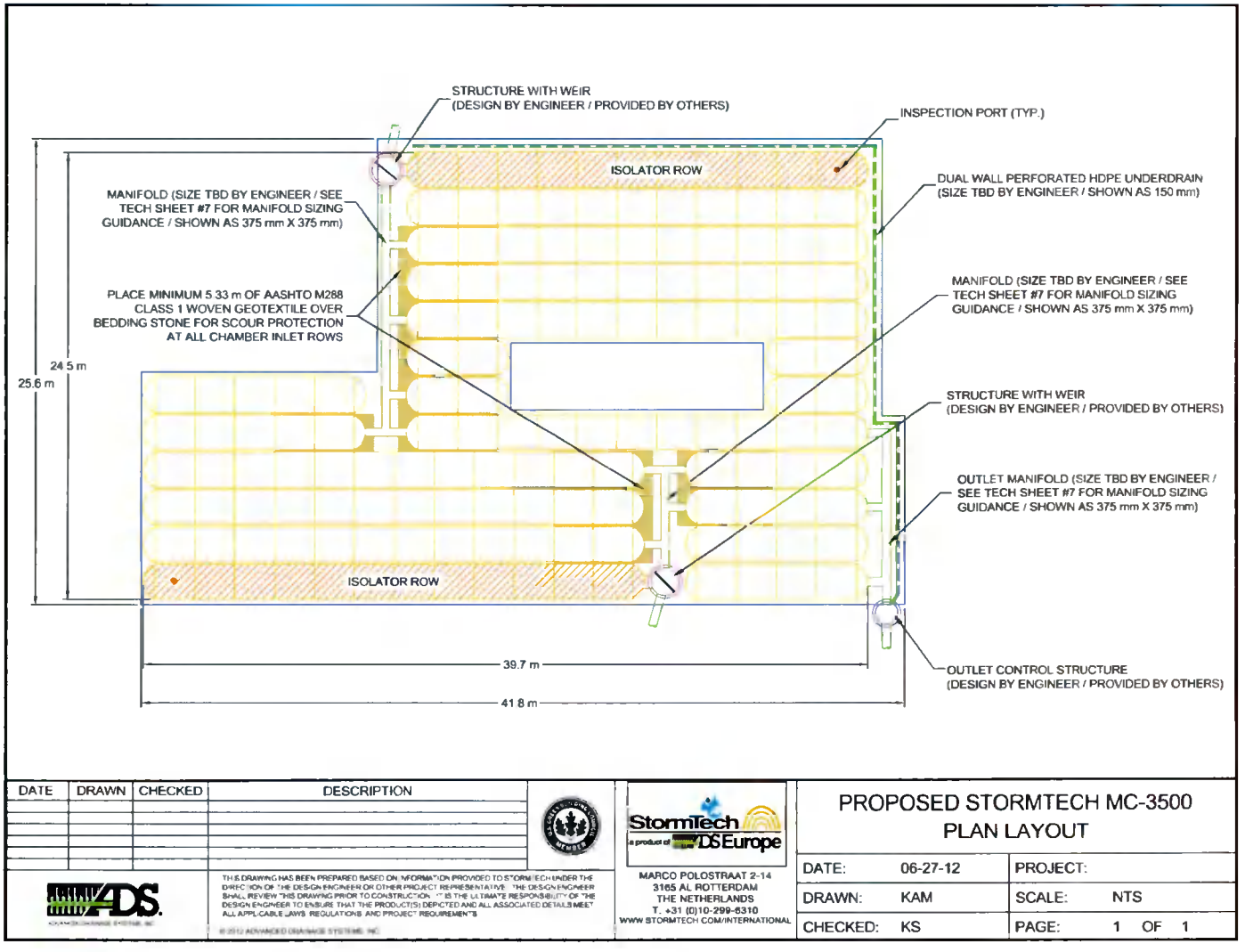


NOTE: NON-WOVEN FABRIC IS ONLY REQUIRED OVER THE INLET PIPE CONNECTION INTO THE END CAP FOR DC-780, MC-3500 AND MC-4500 CHAMBER MODELS AND IS NOT REQUIRED OVER THE ENTIRE ISOLATOR ROW.

A Family of Products and Services

- SC-310 Chambers and End Caps
- SC-740 Chambers and End Caps
- DC-780 Chambers and End Caps
- MC-3500 Chambers and End Caps
- MC-4500 Chambers and End Caps
- SC, DC and MC Fabricated End Caps
- Fabricated Manifold Fittings
- Patented Isolator Row for Maintenance and Water Quality
- In-House System Layout Assistance
- On-Site Educational Seminars
- Worldwide Technical Sales Group
- Centralized Product Applications Department
- Research and Development Team
- Technical Literature, O&M Manuals and Detailed CAD drawings all downloadable via our website at **www.stormtech.com/international**

"Interested in using StormTech products in your design? We would be glad to help you. StormTech provides plan layout and cost estimate services at no additional charge for consulting engineers and developers."



DATE	DRAWN	CHECKED	DESCRIPTION

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO STORMTECH UNDER THE DIRECTION OF THE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS AND PROJECT REQUIREMENTS.

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PROPOSED STORMTECH MC-3500
PLAN LAYOUT

DATE:	06-27-12	PROJECT:	
DRAWN:	KAM	SCALE:	NTS
CHECKED:	KS	PAGE:	1 OF 1

StormTech Customer Support

Please contact one of our inside Technical Service professionals or Engineered Product Managers (EPMs) to discuss your particular application. A wide variety of technical support material is available from our website at **www.stormtech.com/international.** For any questions, please call StormTech at **+31 (0)10 2996410.**

- SC-310, SC-740, and DC-780 Design Manual
- MC-3500 and MC-4500 Design Manual
- SC-310, SC740, and DC-780 Installation Instructions
- MC-3500 and MC-4500 Installation Videos
- Infiltrator Row Informational Video
- CAD Drawings
- Technical Sheets
- Site Calculator Spreadsheets
- Installation Guidelines and Industry Standards
- Industry Links
- Free Layout Assistance
- Pre-construction Meetings
- Case Studies

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Appendix D

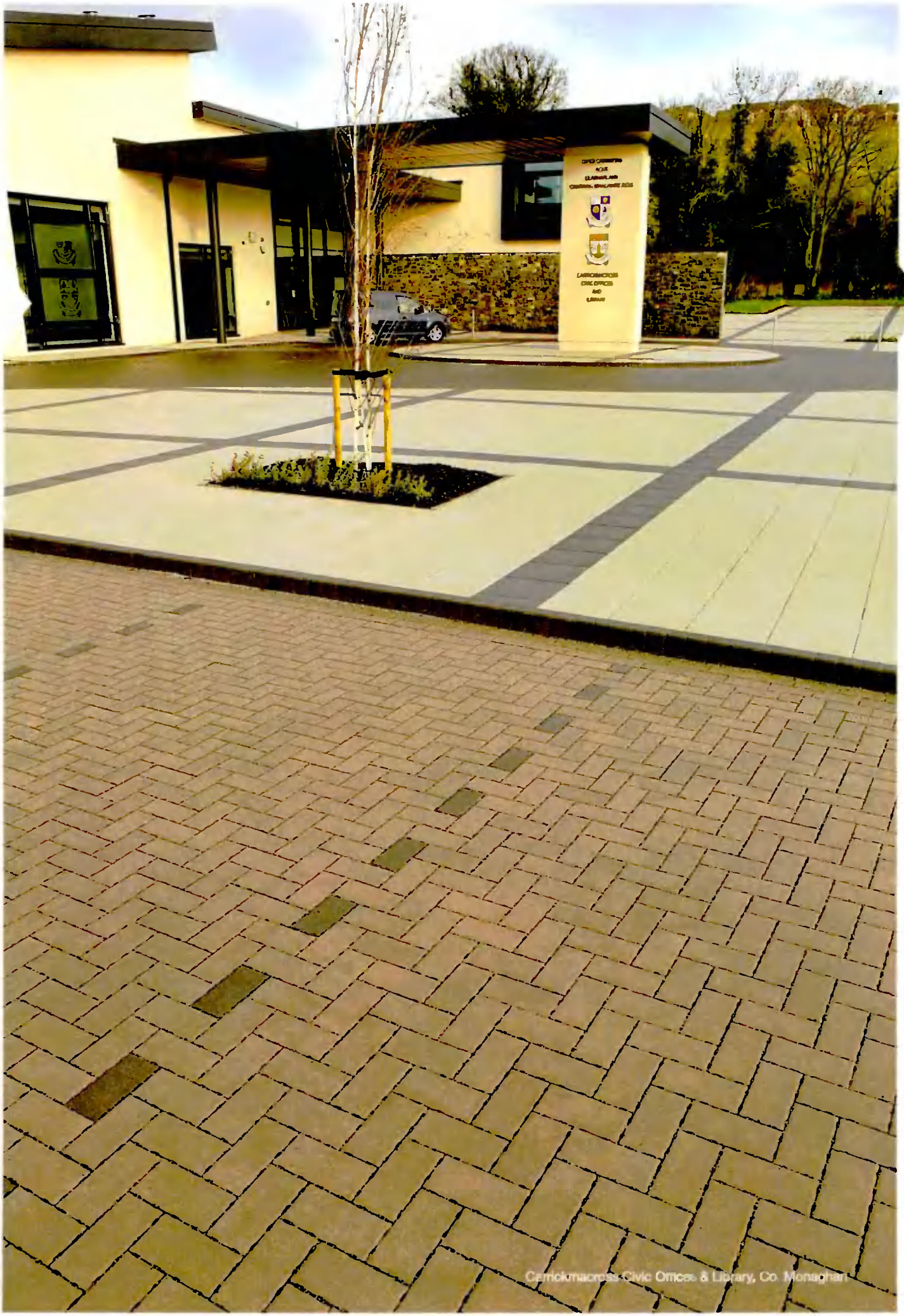
Permeable Paving

Clima-Pave™

Permeable Paving Solutions

Kilsaran

ideas taking shape



Carrickmacross Civic Offices & Library, Co. Monaghan

Clima-Pave™

The rapid development of previously green-field sites and the associated creation of impermeable areas such as roofs, car parks and footpaths will mean that at project conception stage there will be potentially large volumes of surface water to be dealt with. Traditionally this has been done by piping the surface water into storage tanks or discharging it into nearby streams or surface water drainage. This method of drainage is not currently favoured by planners and designers, as it simply moves the surface water downstream where it still has to be dealt with. This is especially important where large volumes of water need to be dealt with during heavy rainfall events. Piping large volumes of water into streams and rivers increases the risk of flooding and also allows for the potential pollution of local water courses and drinking water supplies.

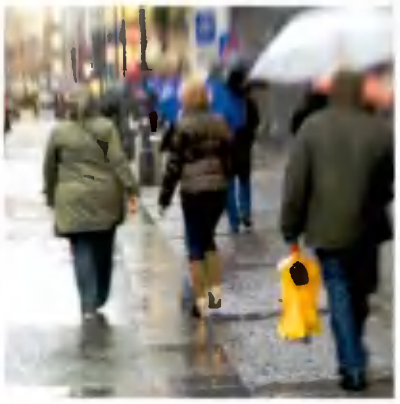
Sustainable Urban Drainage Systems (SUDS) and Water Source Control

Planners are encouraging the use of Sustainable Urban Drainage Systems (SUDS) in all new developments, in particular the use of appropriate source control techniques is important as this allows for the containment of the surface water collected on the site and for this surface water to be dealt with on-site as opposed to traditionally draining it off-site. SUDS, as a sustainable development approach to Surface Water Design Techniques, has the aim of balancing the following:

1. **To manage water run-off from developed areas to similar quantities prior to development (Source Control)**
2. **Reduce and avoid incidences of downstream flooding**
3. **To protect or enhance water quality of the run-off**
4. **To improve or enhance the amenity where possible**

Advantages of Permeable Paving

- Permeable Paving is a 'source control' method. Water is managed and dealt with on-site without piping off to storage tanks or surface water treatment systems
- The Water Framework Directive (Directive 2000/60/EC) requires that surface water discharges are managed to ensure that risk of contamination or pollution are mitigated. Permeable paving systems filter contaminants by microbial action. There is no requirement for additional filtering/polishing with Permeable Paving in normal use
- Separate attenuation tank systems are not required
- No need for gullies or channels or conventional drainage
- Recharges ground water
- Roofs, roads and other non-permeable areas can be discharged into permeable paving (No gullies required)
- No ponding or surface water
- Collected water can potentially be re-used for non-potable purposes
- Improves water quality



Clima-Pave™, the permeable paving solution from Kilsaran, offers an advantage over traditional SUDS techniques, such as storm water attenuation tanks. This is because the stone based sub-base, which needs to be installed for any type of surfacing material, is adapted to an open graded material in permeable paving systems. This allows the water collected from the site to be stored in the pavement and either infiltrated back into the ground or discharged at a controlled rate into the surface water drainage system.

The Clima-Pave™ system is constructed using our specially engineered permeable paving block, which has enlarged joints on all sides, typically 4-8mm in width. When the blocks have been laid, a corresponding slot is formed between the paving blocks which are then filled with a clean 3mm aggregate. This allows water to rapidly drain from the surface down into the pavement.

Traditional block paving is laid on a sand bedding layer and a Type 1/CL. 804 sub-base. To allow for storage and infiltration of the surface water percolating through the block, permeable block paving is laid on a grit laying course instead of sand and an open-graded stone sub-base instead of Type 1/CL. 804.

Clima-Pave™
Permeable Paving Solutions

Advantages of Clima-Pave™ for your project

Clima-Pave™ from Kilsaran offers the widest range of permeable paving products for use in commercial, retail and civic projects.

Kilsaran can also offer a full site-specific permeable paving design for your project, taking into account the site ground conditions, drainage requirements and structural and traffic loading requirements for the site. This is a chargeable service and Kilsaran will provide an indemnified design provided by our nominated Consulting Engineer who will visit the site if required to appraise the installation.

Clima-Pave™
Technical Information

- Design Guidance
- Permeable Paving Aggregates
- Materials for HGV Trafficked Pavements
- Typical Design Diagrams
- Construction & Maintenance Guidelines

Design Guidance

Clima-Pave™ permeable paving provides a structural pavement suitable for both pedestrian and vehicular traffic depending on design. The water management and permeable functionality of the pavement is largely dependent on the correct specification and design of the pavement to meet the unique requirements of the individual site. The correct specification, testing and installation of aggregates is of paramount importance with any permeable paving system to ensure the finished pavement meets both initial and long term design requirements.

We advise that all permeable pavements require a site-specific design which should be carried out in accordance with BS 7533-13:2009 'Pavements constructed with clay, natural stone of concrete pavers. Part 13 Guide for the design of permeable pavements constructed with concrete paving blocks and flags, natural stone slabs and setts and clay pavers'.

We can provide a design service to customers who require a site specific design to be carried out for their project. In order to carry out this, we require a completed Clima-Pave™ Permeable Paving Design form available to download from our website, from our Sales team or can be requested by emailing technical@kilsaran.ie. This form should be returned via email with the supporting information about the site to enable a design to be carried out.

The information required includes:

- **Drawings of proposed site layout in AutoCad**
- **Full existing and proposed site levels for the pavement**
- **Full site investigation report to establish ground conditions and soaked CBR values of the sub-grade at formation level**
- **Infiltration values from soak-pit testing to BRE 365**
- **Overall drainage design strategy for the site**
- **Planning requirements or conditions for the site relating to paving and drainage (e.g. discharge limits)**
- **Any other pertinent site specific information or client / contractor requirements**

Design Guidance Basics

The below information is provided for guidance purposes only at project conception stage to allow appraisal of a permeable pavement system. Full independent advice should be sought from both the Consulting Engineer and the Contractor prior to the commencement of works. A full site-specific design will always be required in accordance with the above guidelines and BS 7533-13:2009.

The design information below is based on BS 7533-13:2009 which should also be consulted at project appraisal stage.

Types of Permeable Pavement

There are three main types of permeable pavement commonly used on sites:

System A – Full Infiltration: All water from the pavement is infiltrated to the ground

Suitable for sites with good ground conditions, higher CBR values and soils which will readily allow water to dissipate through the ground. These favourable conditions are rarely encountered on larger sites.

System B – Partial Infiltration: Most water infiltrated to ground with excess water piped off

Suitable for sites with medium ground conditions. The soil will infiltrate some of the water in the system. When storm events occur and water builds up in the system due to the soil being at capacity for drainage, perforated pipes are laid in the bottom of the sub-base to deal with the excess, taking it to the surface water drainage system. This is the most commonly used type of permeable pavement.

System C – Fully Tanked System: No water is allowed to infiltrate to ground

This type of system is used where poor sub-grade drainage conditions exist (heavy clays), where the stability of the sub-grade would diminish if extra surface water was introduced, or where ground water levels are within 1 metre of the formation level (system could gain water). In this system the sub-base acts essentially as an attenuation tank, wrapped in an impermeable polythene membrane and all water is piped out.

Selection of Pavement Type

The type of permeable pavement system to be adapted is based primarily on site ground conditions, site suitability and the permeability values of the sub-grade encountered on site from infiltration soak-pit testing. Table 1 gives guidance on the suitability of the three types of permeable pavement system.

Table 1: Guidance on selection of a pavement system

		System A - total infiltration	System B - partial infiltration	System C - no infiltration
Permeability of subgrade defined by coefficient of permeability, k (m/s)	10^{-6} to 10^{-3}	✓	✓	✓
	10^{-8} to 10^{-6}	✗	✓	✓
	10^{-10} to 10^{-8}	✗	✗	✓
Highest recorded water table within 1000mm of formation level		✗	✗	✓
Pollutants present in subgrade		✗	✗	✓

Selection of Pavement Sub-Base Thickness

The design of the sub-base for the permeable pavement should take into account the traffic loadings likely to use the pavement. It is essential to take into account any future increase in traffic volume and any HGV traffic which may use the pavement irrespective of how frequent. The correct loading category should be then selected from Table 2 taking into account the above considerations. It should be noted that no layers of the permeable pavement are designed for site traffic to use them and when finished the permeable pavement surface should not be trafficked by site traffic vehicles which are heavier than that for which the pavement was designed. It is advisable to complete paving works after all other work in the vicinity has been completed.

Typical build up details for each traffic category are illustrated on page 20 and 21 for guidance purposes.

Table 2: Loading Categories

1 DOMESTIC PARKING	2 CAR	3 PEDESTRIAN	4 SHOPPING	5 COMMERCIAL	6 HEAVY TRAFFIC
No Large Goods Vehicles	Emergency Large Goods Vehicles only	One Large Goods Vehicles per week	Ten Large Goods Vehicles per week	100 Large Goods Vehicles per week	1000 Large Goods Vehicles per week
Zero standard axles	**100 standard axles**	**0.015msa**	**0.15msa**	**1.5msa**	**15msa**
Patio	Car Parking Bays and Aisles	Town/city Pedestrian Street	Retail development delivery access route	Industrial Premises	Main road
Private Drive	Railway Station platform	Nursery Access	School/college access road	Lightly Trafficked Public Road	Distribution Centre
Decorative feature	External Car Showroom	Parking area to residential development	Office block delivery route	Light industrial development	Bus Station (bus every 5 minutes)
Enclosed Playground	Sports Stadium Pedestrian route	Garden centre external display area	Deliveries to small residential development	Mixed retail/ industrial development	Motorway Truck Stop
Footway with zero vehicle overrun	Footway with occasional overrun	Cemetery Crematorium	Garden centre delivery route	Town Square	Bus Stop
	Private drive/ footway crossover	Hotel Parking	Fire Station Yard	Footway with regular overrun	Roundabout
		Airport Car Park with no bus pickup	Airport Car Park with bus to terminal	Airport landside roads	Bus Lane
		Sports Centre	Sports Stadium access route/ forecourt		

msa = millions of standard 8,000 kg axles

Sub-Base Thickness For Water Storage

The sub base depth must also take into consideration the water storage requirements for the site. The depth of sub-base may have to be adjusted to allow for increased site specific water storage. Further guidance on hydraulic factors can be found in BS 7533-13:2009 section 5.4.

Adjustment To Pavement Design For Low CBR Sub-Grade

In the case of CBR values below 5%, either ground improvement work will be required for the site, or the thickness of the coarse graded aggregate sub-base will have to be adjusted in accordance with 5.6.3 and table 9 of BS 7533-13:2009

Permeable Paving Aggregates

All materials used as permeable paving aggregate must comply to the grading and physical requirements below, as well at the general requirements of BS EN 12620 and BS EN 13242. Sub-base laying course materials should be clean, sound, non-friable and sound crushed rock material. Rounded gravel materials are not recommended for sub-base layers. The jointing material may be either clean crushed material or clean gravel material. The materials should be tested to confirm that it meets the requirements below.

The contractor shall also ensure that on-going deliveries to site are checked frequently for grading, shape and inspected to ensure cleanliness.

During installation on site, great care and attention must be paid to ensure that the aggregates are kept free of contamination and deleterious matter. Construction traffic cannot be allowed to traverse the layers of permeable paving aggregates during installation.

4/40mm Coarse Graded Permeable Paving Aggregate

Sieve Size (mm)	Percentage Passing
80	100
63	98-100
40	90-99
31,5	-
20	25-70
10	-
4	0-15
2	0-5

4/20mm Coarse Graded Permeable Paving Aggregate

Sieve Size (mm)	Percentage Passing
40	100
31,5	98-100
20	90-99
10	25-70
4	0-15
2	0-5

2/6.3mm Laying Course Paving Aggregate

Sieve Size (mm)	Percentage Passing
14	100
10	98-100
6.3	80-99
2	0-20
1	0-5

3mm Jointing Grit

Sieve Size (mm)	Percentage Passing
40	100
8	100
6.3	95-100
4	85-99
2	15-35
1	0-10
0.063	0.0-1.5

Property	Category to BS EN 13242 or BS EN 12620
Grading	4/20 (preferred) or 4/40 as per table above
Fines Content	F4
Shape	FI20
Resistance to Fragmentation	LA30
Water Absorption to BS EN 1097-6:2000	WA2
For water absorption > 2% Magnesium Sulfate Soundness	MS18
Resistance to Wear	MDE20
Acid Soluble Sulfate Content	AS0.2
Total Sulfur	≤1% by mass
Recycled Aggregates	Seek guidance from Kilsaran Technical Department

Materials for HGV Trafficked Areas

For loading category 3 and above as detailed in Table 2 page 17, these pavement types are designed to accommodate HGV traffic either on an occasional or more frequent basis. The pavement structure therefore requires a 'stiffening layer' to accommodate the HGV traffic which exerts significantly increased loading on the pavement. This stiffening layer can be either a hydraulically-bound coarse graded aggregate (porous no fines concrete) as detailed below and shown on the section details on pages 20 and 21 or alternatively a 80mm thick layer of DBM macadam as detailed below.

DBM Macadam Material

The DBM material should be an AC 32 Dense Base complying with the requirements of BS EN 13108-1 and should be supplied and installed to meet the requirements of BS 594987:2010. The DBM should be punctured after installation at 750mm centres with 100mm diameter holes. The holes should be fully filled and compacted with the appropriate coarse graded permeable paving aggregate as used in the layer underneath.

Hydraulically-Bound Coarse Graded Aggregate (Porous No Fines Concrete)

Porous concrete provides a stiffening transfer layer in concrete block permeable pavements which are to receive heavier traffic loads. The lack of sand (fines) in the mixture allows the material to act as a transfer drainage layer, whereby the open-graded matrix of the material allows for 20%-30% voids within the compacted volume of the material. Special measures are to be taken in the production, installation and curing of this material. Kilsaran can provide information and guidance on this upon request.

Product Standard	BS EN 14227-1
Material Compositon	Hydraulically Bound Coarse Graded Aggregate is a mixture of a coarse aggregate (usually 20mm nominal size), cement and water.
Typical Compressive Strength	Class C5/6 in accordance with IS EN 14227-1,Table 2 Line 4. Other strength classes available upon request from supplier.

Typical Design Diagrams

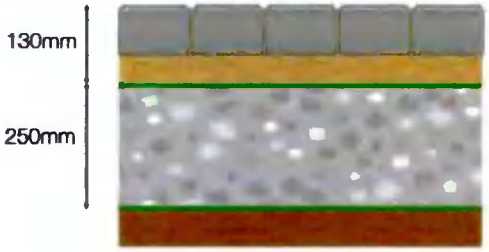
Below are typical build-up details for permeable pavement systems based on BS 7533-13:2009. These diagrams are based on ideal site conditions for drainage and CBR values of 5% or greater. The diagrams are for project appraisal purposes only and in all cases a site specific design in accordance with BS 7533-13:2009 will be required.

Key:

- 2 / 6.3mm Laying Course
- Hydraulically-Bound Coarse Graded Aggregate or 80mm of DBM Macadam
- 4 / 20mm Coarse Graded Aggregate and /or 4/40mm Coarse Graded Aggregate
- Capping Material
- Approved Geotextile
- Approved Impermeable Membrane

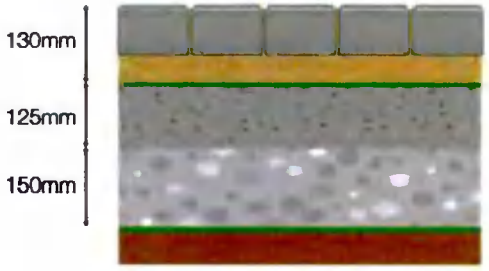
System A & B (Infiltrating & Partial Infiltration Systems)

LOAD CATEGORY 1



LOAD CATEGORY 2

LOAD CATEGORY 3



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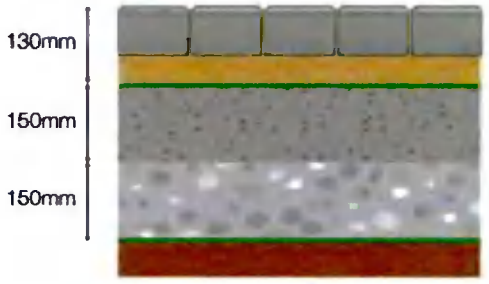
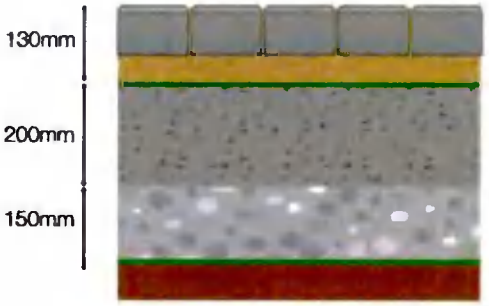
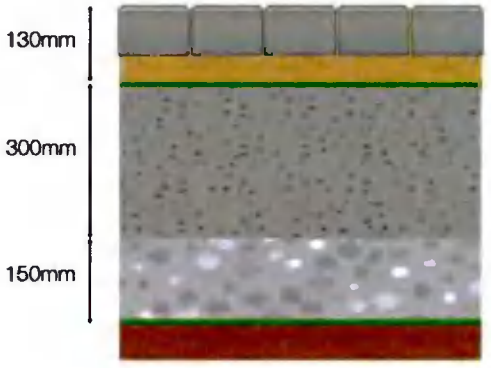


LOAD CATEGORY 5



LOAD CATEGORY 6



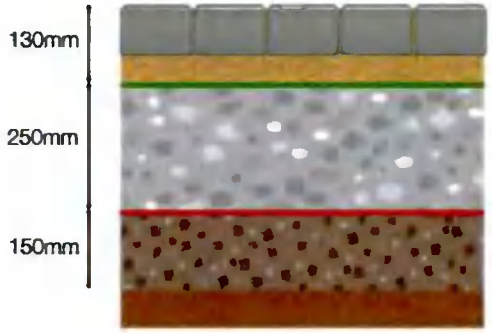
Alternative build up / materials may be used depending on project specific details.

For load categories 3-6 the hydraulically-bound coarse graded aggregate (porous no fines concrete) layer may be replaced with 80mm depth of DBM Macadam to act as a stiffening layer. The macadam layer should be punctured at 750mm centres on grid. Further details on the DBM macadam layer are given on page 19.

Where the depth of aggregate sub-base is in excess of 350mm for the given loading category, it may be possible to reduce the depth of aggregate required and provide a more cost effective design with the use of an appropriate and approved geo-grid. This can be appraised at design stage.

System C (Fully Tanked/Bunded)

LOAD CATEGORY 1



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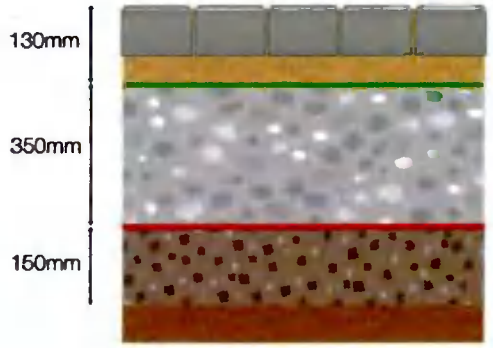
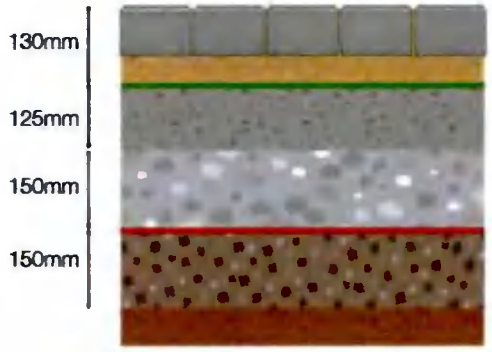
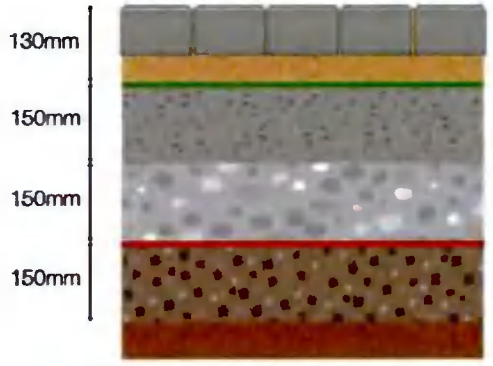


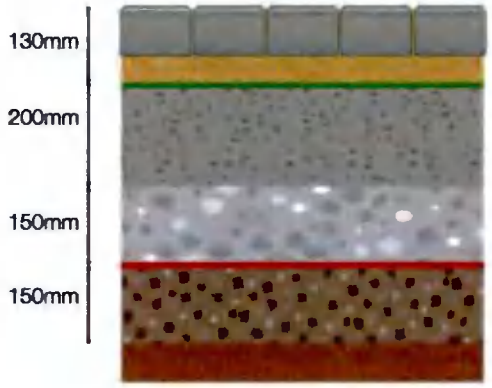
LOAD CATEGORY 3



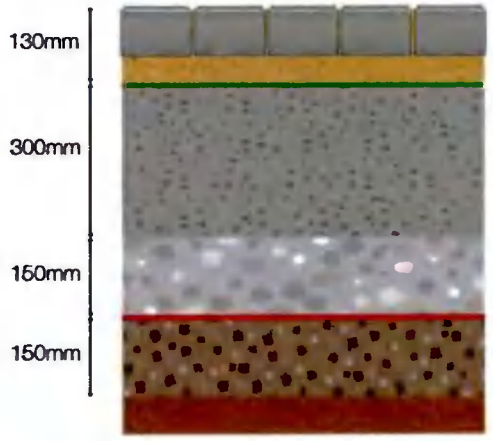
LOAD CATEGORY 4



LOAD CATEGORY 5



LOAD CATEGORY 6

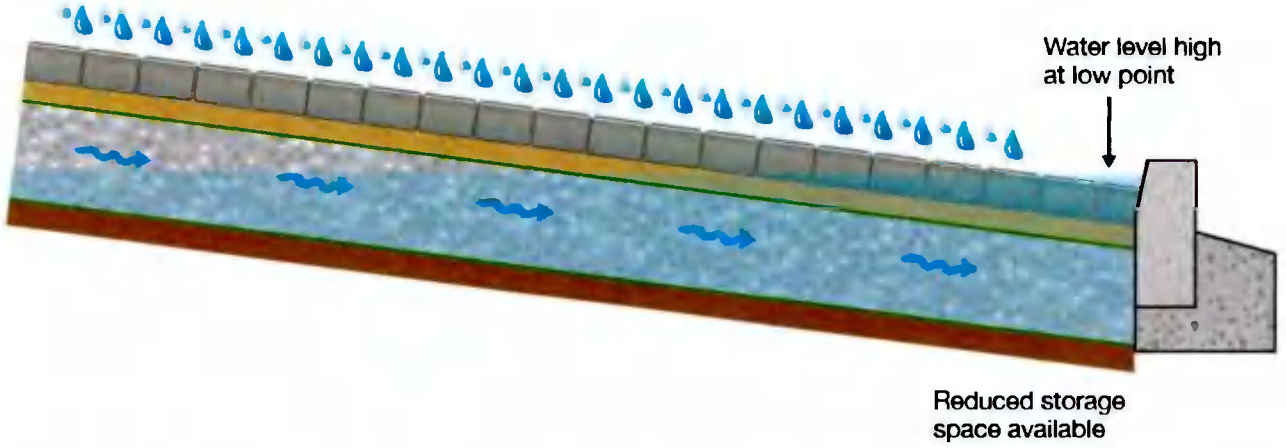


In the case of System C (fully tanked permeable pavements) there is always a requirement for 150mm depth of capping to be used beneath the impermeable membrane as shown above. The capping material should be approved by the Engineer and should comply with either the NRA Specification for Roadworks Series 600 or the Specification for Highway Works Series 600. The material should be tested before and during supply for full compliance, and should be compacted in accordance with the series 600 requirements. The capping layer should be blinded immediately before laying the impermeable membrane to prevent puncturing the membrane.

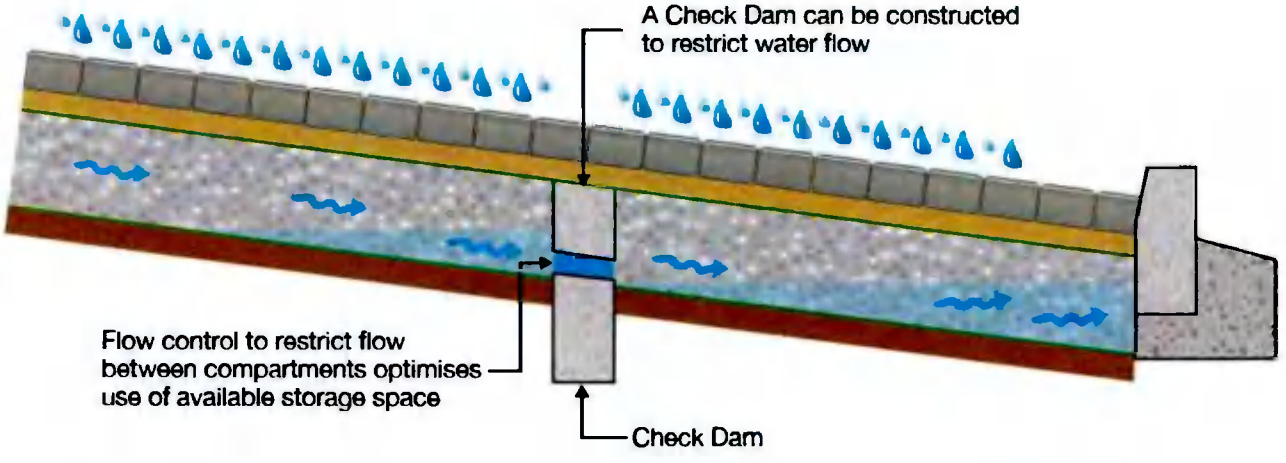
The requirement for using capping material may be eliminated by carrying out a design using an appropriate geo-grid which would negate the requirement for both the capping material and may also reduce the total depth of sub-base stone required.

Sloping Sites

On sloping sites water will naturally collect at the lowest point of the pavement. If sharp falls are allowed on site this will reduce the effective water storage capacity of the sub-base aggregate. In order to minimise this effect, gradients should be at a maximum 1 in 20 and preferably 1 in 30 or better.



Where sloping sites are unavoidable due to site layout, it will be necessary to reduce any sharp falls to maintain the water attenuation capacity of the system. This can be achieved by creating 'dams' in the sub-base of the pavement which will 'step' the pavement sub-base and reduce the overall falls. On extreme slopes, the pavement can be terraced with a step down and a dam between the two levels to restrict water flow.



Construction & Maintenance Guidelines

Construction

To ensure correct performance and durability of a permeable pavement, a fully detailed design should be carried out in accordance with BS 7533-13:2009 taking into account all site specific requirements for the project. Construction should be carried out strictly in accordance with BS 7533-13:2009 and BS 7533-3. All materials to be used shall be tested for full compliance to the above standard both before supply and during construction. It is also advised not to use any of the layers of permeable pavement construction for site traffic unless the build-up has been specifically designed to accommodate this. Additionally site equipment such as tele-handlers and forklifts should not be used on the paving surface after construction has been completed unless the pavement has been designed to accommodate this.

Maintenance

Permeable pavements should not be contaminated with soft landscaping materials, soil, detritus or general dirt as this may wash into the pavement. Also the pavement should not be trafficked by construction traffic or unsuitably heavy vehicles above that for which the pavement was designed.

To keep any growths or weeds to a minimum it is advised that the installed permeable paving be sealed with an appropriate sealer. Where the paved area is beneath overhanging trees or in a very damp area, an annual treatment of an environmentally friendly weed killer can be applied. Note the weed killer should be applied as directed by the supplier and only in very dry weather where rain is not expected, active weed killer could be washed into the sub-system otherwise. The manufacturer's instructions for all treatment products should be followed in detail.

The pavement should be inspected on a routine basis and carefully swept as required using a mechanical sweeper or by hand for smaller areas. The sweeping action may remove some of the jointing grit from the surface, the joints must be topped up after sweeping if required.

Should silting or blocking of the joints occur after a period of years, the use of a suitable jet wash and suction sweeper should be used to remove the defective material. It is likely that the jetting of the pavement will remove some grit. This grit should be replaced as required.

As with conventional block pavements, depressions, rutting and cracked or broken blocks which may be a structural concern or a hazard to users should be remedied as soon as possible. All joints must be maintained full at all times.

Permeable pavements will drain relatively quickly compared with other types of surfacing, and are not as liable to freezing over of standing water, hoar frosts may occur which can cause surface slip on any material. The use of de-icing salts on permeable pavements, as with any other concrete surface, should be kept to a minimum as the chlorides in the salt will penetrate the concrete and excessive use will damage the surface. Any de-icing material applied should not cause blockage or clogging of the permeable pavement joints (if blockage occurs in localised areas this will need to be removed by suction sweeper and joints topped up with appropriate jointing grit). It should also be considered that any de-icing material used will drain into either the sub-grade or the drainage system through the permeable pavement. Care should be taken to ensure no contamination of water courses or drainage systems. De-icing materials should be applied to the paving surface before ice or snow covers the surface to prevent damage.

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