Appendix B

Storm Water Attenuation Calculations

Technical Note

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Project title	INXN DUB15/16	Job number	280503-00
cc		File reference	PL RFI Response
Prepared by	Cid dos Santos Junior	Date	31 January 2022
Subject	Proposed Surface Water Drainage Design		

1 Introduction

Microdrainage design software is based on the Wallingford procedure. It has the ability to model and analyse fully integrated drainage systems. The INXN DUB 15 & DUB 16 Data Centres storm water attenuation systems and drainage network are designed using Microdrainage simulation.

2 Microdrainage Simulation Summary

The proposed surface water drainage system is designed for a 5 year storm return period. The system is simulated and indicates no surface flooding at any part of the site for storms up to and including the 1:100 year return period plus 20% for climate change. Refer to Arup drawing C-0104 for the surface water drainage layout and Arup drawing C-0105 for surface water drainage catchment areas brake-up.

3 Design Criteria and Loading

The proposed surface water drainage system is designed in accordance with Part H of the Building Regulations, BS EN 752 Drain and Sewer System, the Greater Dublin Regional Code of Practice for Drainage Works.

The Flood Studies Report (FSR) rainfall methodology is used in the programme. Rainfall is calculated using Region, Return Period, M5-60, and Ratio R as explained further below.

The programme uses the M5-60 (60 minutes storm duration of 5 year return period) and ratio R (M5-60/M5-2 day) to calculate the intensity/duration/ frequency characteristics for any location in Ireland.

A rainfall depth of 16.900mm on 60 minutes storm duration of 5 year return period and a ratio of 0.272 was applied as design criteria on Microdrainage 2020.1.3. Refer to Appendix B for a copy of the Met Eireann Rainfall Statistics for the location.

Based on Irish Water Guidelines, a recommended value of 3 minutes global time of entry (Te) was applied.

4 Building Storm Network Details

The storm network is designed on Microdrainage 2015.1.1 using a 5 year return period. The pipe network and gradient are assigned using the Modified Rational Method where:

Q (l/s) = Cv*Cr*(2.78*I(mm/hr)*A (ha))

Cv= 0.75 and Cr= 1.3 (as recommended by the Wallingford Procedure)

The programme uses the M5-60 (16.900mm) and ratio (0.272) to calculate the intensity/duration/ frequency characteristics for any location in Ireland.

The storm network has one online flow control device (Hydro-brake), located immediately after the Attenuation Pond. The Hydro-brake design head is of 1.500m and design flow of 8.06 l/s.

This is in line with extract from Table 6.3 of the Greater Dublin Regional Code of Practice for Drainage Works and South Dublin County Council requirements with maximum allowable discharge QBAR. The proposed overall site area to be incorporated into the proposed surface water system is 4.053 ha. The remaining area will be part of the watercourse catchment and the existing surface water system along The Fairways road. See Arup Drawing C-0105 for further information on catchment areas.

	4.3	100	Maximum discharge rate of QBAR or 2 l/s/ha, whichever is the greater, for all attenuation storage where separate "long term" storage cannot be provided.

Table 6.3 Criteria for New Development Drainage

The allowable discharge rate was calculated based on the below:

Site Easting: 303941
Site Northing: 230229
Total Site Area: 4.053 hectares
FSR Soil Class: 2
M5-60 16.900
r: 0.272
Annual Rainfall (SAAR): 754mm (Based on Met Eireann 1981-2010 Rainfall Grids)

$$Q_{BARrural} = 0.00108A^{0.89}SAAR^{1.17}SOIL^{2.17}$$

Resulting then in a Qbar of 1.99 l/s/ha and a total allowable discharge rate of 8.06 l/s.

The storm water network has one online attenuation pond. The attenuation pond will intercept surface water runoff in the network and limit the discharge to the 8.06 l/s according to the allowable 1.99 l/s/ha through use of Hydro-brake.

The storm water attenuation facility will provide storage volume of 2498.0 m3, which is designed to cater for storms up to and including the 1 in 100 year return period plus 20% for climate change. Please refer to attached copy of storm attenuation simulation calculation for details. Refer to Arup drawings C-0104 and C-0105 for further information.

5 Storm Network Simulation

The level of service includes no surface flooding for return periods up to 1:100 year plus 20% for climate change. Detailed summary of critical results of the 5 year+20%, 30 year+20% and 100 year + 20% is included in this report in Appendix B, Microdrainage Simulation.

Technical Note

280503-00 31 January 2022

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Cid dos Santos Junior	Kieran Dowdall	John MacCarthy
Signature			

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	73.814	0.386	8.1	540.3	O K
30 min Summer	73.948	0.520	8.1	745.5	O K
60 min Summer	74.083	0.655	8.1	961.2	O K
120 min Summer	74.226	0.798	8.1	1199.9	O K
180 min Summer	74.313	0.885	8.1	1350.6	O K
240 min Summer	74.376	0.948	8.1	1462.7	O K
360 min Summer	74.465	1.037	8.1	1623.2	O K
480 min Summer	74.525	1.097	8.1	1736.2	O K
600 min Summer	74.570	1.142	8.1	1821.3	O K
720 min Summer	74.605	1.177	8.1	1888.0	O K
960 min Summer	74.655	1.227	8.1	1984.7	O K
1440 min Summer	74.710	1.282	8.1	2092.6	O K
2160 min Summer	74.735	1.307	8.1	2142.7	O K
2880 min Summer	74.737	1.309	8.1	2146.7	O K
4320 min Summer	74.724	1.296	8.1	2119.9	O K
5760 min Summer	74.701	1.273	8.1	2074.5	O K
7200 min Summer	74.674	1.246	8.1	2020.5	O K
8640 min Summer	74.643	1.215	8.1	1961.6	O K
10080 min Summer	74.612	1.184	8.1	1900.1	O K
15 min Winter	73.857	0.429	8.1	605.6	O K
30 min Winter	74.006	0.578	8.1	835.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	88.392	0.0	484.2	19
30 min Summer	61.225	0.0	634.1	34
60 min Summer	39.777	0.0	945.6	64
120 min Summer	25.154	0.0	1176.3	124
180 min Summer	19.082	0.0	1283.0	184
240 min Summer	15.649	0.0	1287.6	244
360 min Summer	11.804	0.0	1248.8	362
480 min Summer	9.651	0.0	1216.2	482
600 min Summer	8.250	0.0	1192.5	602
720 min Summer	7.256	0.0	1175.2	722
960 min Summer	5.924	0.0	1154.8	962
1440 min Summer	4.450	0.0	1155.0	1440
2160 min Summer	3.340	0.0	2412.5	2100
2880 min Summer	2.721	0.0	2341.6	2448
4320 min Summer	2.036	0.0	2223.8	3204
5760 min Summer	1.657	0.0	3907.7	4040
7200 min Summer	1.411	0.0	4144.5	4896
8640 min Summer	1.238	0.0	4266.4	5712
10080 min Summer	1.108	0.0	4069.3	6552
15 min Winter	88.392	0.0	537.8	19
30 min Winter	61.225	0.0	667.8	34

Summary of Results for 100 year Return Period (+20%)

	Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60	min Winter	74.154	0.726	8.1	1078.6	O K
120	min Winter	74.312	0.884	8.1	1349.3	O K
180	min Winter	74.409	0.981	8.1	1521.1	O K
240	min Winter	74.478	1.050	8.1	1647.4	O K
360	min Winter	74.575	1.147	8.1	1830.1	O K
480	min Winter	74.643	1.215	8.1	1960.5	O K
600	min Winter	74.694	1.266	8.1	2060.3	O K
720	min Winter	74.734	1.306	8.1	2139.6	O K
960	min Winter	74.793	1.365	8.1	2257.8	O K
1440	min Winter	74.862	1.434	8.1	2399.1	O K
2160	min Winter	74.903	1.475	8.1	2486.3	O K
2880	min Winter	74.909	1.481	8.1	2498.0	O K
4320	min Winter	74.887	1.459	8.1	2452.6	O K
5760	min Winter	74.854	1.426	8.1	2383.8	O K
7200	min Winter	74.811	1.383	8.1	2296.0	O K
8640	min Winter	74.763	1.335	8.1	2198.9	O K
10080	min Winter	74.712	1.284	8.1	2097.0	O K

Storage Volume Required

	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60	min Winter	39.777	0.0	1054.4	64
120	min Winter	25.154	0.0	1276.1	122
180	min Winter	19.082	0.0	1287.1	182
240	min Winter	15.649	0.0	1261.4	240
360	min Winter	11.804	0.0	1220.8	358
480	min Winter	9.651	0.0	1196.9	476
600	min Winter	8.250	0.0	1183.8	594
720	min Winter	7.256	0.0	1179.1	710
960	min Winter	5.924	0.0	1189.8	942
1440	min Winter	4.450	0.0	1210.6	1400
2160	min Winter	3.340	0.0	2435.0	2072
2880	min Winter	2.721	0.0	2394.8	2708
4320	min Winter	2.036	0.0	2353.3	3376
5760	min Winter	1.657	0.0	4367.3	4328
7200	min Winter	1.411	0.0	4589.9	5264
8640	min Winter	1.238	0.0	4480.3	6216
10080	min Winter	1.108	0.0	4259.7	7064

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.900	Shortest Storm (mins)	15
Ratio R	0.272	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 3.294 ← Total Catchment Impermeable Area

Time (mins) From:	To:	Area (ha)
0	4	3.294

Model Details

Storage is Online Cover Level (m) 75.405

Tank or Pond Structure

Invert Level (m) 73.428

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1306.4	1.500	2109.3	1.850	2404.2	1.990	3382.4

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0125-8100-1500-8100
Design Head (m)	1.500
Design Flow (l/s)	8.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	125
Invert Level (m)	73.428
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	8.1
Flush-Flo™	0.437	8.1
Kick-Flo®	0.922	6.4
Mean Flow over Head Range	-	7.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.5	1.200	7.3	3.000	11.2	7.000	16.8
0.200	7.3	1.400	7.8	3.500	12.1	7.500	17.4
0.300	7.9	1.600	8.3	4.000	12.9	8.000	17.9
0.400	8.1	1.800	8.8	4.500	13.6	8.500	18.5
0.500	8.1	2.000	9.3	5.000	14.3	9.000	19.0
0.600	7.9	2.200	9.7	5.500	15.0	9.500	19.5
0.800	7.3	2.400	10.1	6.000	15.6		
1.000	6.7	2.600	10.5	6.500	16.2		

Ove Arup & Partners International Ltd		
The Arup Campus Blyth Gate Solihull B90 8AE	**Surface Water Drainage Network**	Micro Drainage
Date 31/01/2021 File Drainage Network Design ...	Designed by Cid Dos Santos Ju... Checked by	
XP Solutions	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	16.900	Add Flow / Climate Change (%)	20
Ratio R	0.272	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.000	22.561	0.113	200.0	0.059	3.00	0.0	0.600		o	375	Pipe/Conduit	
S3.001	18.677	0.093	200.0	0.002	0.00	0.0	0.600		o	375	Pipe/Conduit	
S3.002	33.300	0.167	200.0	0.188	0.00	0.0	0.600		o	375	Pipe/Conduit	
S3.003	27.200	0.136	200.0	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
S3.004	30.424	0.152	200.0	0.190	0.00	0.0	0.600		o	375	Pipe/Conduit	
S4.000	85.240	0.284	300.1	0.232	3.00	0.0	0.600		o	375	Pipe/Conduit	
S4.001	12.169	0.041	296.8	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.000	50.00	3.29	75.365	0.059	0.0	0.0	1.6	1.28	141.1	9.6
S3.001	50.00	3.54	75.252	0.060	0.0	0.0	1.6	1.28	141.1	9.8
S3.002	50.00	3.97	75.159	0.249	0.0	0.0	6.7	1.28	141.1	40.4
S3.003	50.00	4.33	74.992	0.249	0.0	0.0	6.7	1.28	141.1	40.4
S3.004	50.00	4.72	74.856	0.438	0.0	0.0	11.9	1.28	141.1	71.2
S4.000	50.00	4.37	75.005	0.232	0.0	0.0	6.3	1.04	114.9	37.7
S4.001	50.00	4.56	74.721	0.232	0.0	0.0	6.3	1.05	115.6	37.7

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S4.002	6.772	0.023	294.4	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
S3.005	40.195	0.134	300.0	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	
S3.006	56.354	0.188	299.8	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
S5.000	27.436	0.110	250.0	0.097	3.00	0.0	0.600		o	375	Pipe/Conduit	
S5.001	37.989	0.177	214.3	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
S6.000	69.226	0.346	200.0	0.306	3.00	0.0	0.600		o	450	Pipe/Conduit	
S7.000	8.164	0.010	816.4	0.138	3.00	0.0	0.045	4 \=/	500	1:4	Swale	
S7.001	97.966	0.122	803.0	0.008	0.00	0.0	0.045	4 \=/	500	1:4	Swale	
S7.002	0.897	0.001	896.9	0.004	0.00	0.0	0.045	4 \=/	500	1:4	Swale	
S7.003	19.444	0.024	810.2	0.000	0.00	0.0	0.045	4 \=/	500	1:4	Swale	
S7.004	4.239	0.005	847.7	0.000	0.00	0.0	0.045	4 \=/	500	1:4	Swale	
S7.005	4.747	0.006	791.2	0.000	0.00	0.0	0.045	4 \=/	500	1:4	Swale	
S7.006	7.750	0.388	20.0	0.000	0.00	0.0	0.045	o	225	Pipe/Conduit		
S6.001	11.546	0.058	200.0	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.002	50.00	4.67	74.680	0.232	0.0	0.0	6.3	1.05	116.1	37.7
S3.005	50.00	5.30	74.657	0.671	0.0	0.0	18.2	1.17	185.9	109.0
S3.006	50.00	6.03	74.523	0.671	0.0	0.0	18.2	1.29	278.9	109.0
S5.000	50.00	3.40	74.855	0.097	0.0	0.0	2.6	1.14	126.1	15.8
S5.001	50.00	3.91	74.745	0.097	0.0	0.0	2.6	1.23	136.3	15.8
S6.000	50.00	3.80	74.960	0.306	0.0	0.0	8.3	1.43	228.1	49.8
S7.000	50.00	3.84	76.113	0.138	0.0	0.0	3.7	0.16	26.7	22.4
S7.001	40.17	13.84	76.103	0.146	0.0	0.0	3.7	0.16	26.9	22.4
S7.002	40.03	13.94	75.981	0.150	0.0	0.0	3.7	0.15	25.5	22.4
S7.003	37.35	15.93	75.980	0.150	0.0	0.0	3.7	0.16	26.8	22.4
S7.004	36.81	16.38	75.956	0.150	0.0	0.0	3.7	0.16	26.2	22.4
S7.005	36.25	16.86	75.951	0.150	0.0	0.0	3.7	0.16	27.1	22.4
S7.006	36.05	17.03	75.944	0.150	0.0	0.0	3.7	0.73	29.0	22.4
S6.001	35.90	17.17	74.614	0.457	0.0	0.0	8.9	1.43	228.1	53.3

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.002	12.680	0.063	201.3	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
S5.002	14.010	0.093	150.0	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
S3.007	2.755	0.009	300.0	0.364	0.00	0.0	0.600		o	525	Pipe/Conduit	
S8.000	6.754	0.008	844.3	0.018	3.00	0.0		0.045	4 \=/	500	1:4 Swale	
S8.001	4.402	0.006	733.7	0.000	0.00	0.0		0.045	4 \=/	500	1:4 Swale	
S8.002	3.472	1.736	2.0	0.000	0.00	0.0		0.045	o	150	Pipe/Conduit	
S3.008	46.665	0.156	299.1	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
S3.009	26.662	0.089	299.6	0.364	0.00	0.0	0.600		o	525	Pipe/Conduit	
S9.000	60.720	0.076	798.9	0.067	3.00	0.0		0.045	4 \=/	500	1:4 Swale	
S9.001	2.955	1.970	1.5	0.000	0.00	0.0		0.045	o	150	Pipe/Conduit	
S3.010	31.013	0.103	301.1	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
S10.000	38.156	0.636	60.0	0.040	3.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.002	35.75	17.30	74.481	0.457	0.0	0.0	8.9	1.58	341.0	53.3
S5.002	35.61	17.43	74.418	0.554	0.0	0.0	10.7	1.83	395.4	64.1
S3.007	35.57	17.47	74.335	1.589	0.0	0.0	30.6	1.29	278.8	183.6
S8.000	50.00	3.78	76.405	0.018	0.0	0.0	0.5	0.14	18.0	3.0
S8.001	50.00	4.21	76.397	0.018	0.0	0.0	0.5	0.17	28.2	3.0
S8.002	50.00	4.24	76.391	0.018	0.0	0.0	0.5	1.76	31.1	3.0
S3.008	34.93	18.07	74.326	1.607	0.0	0.0	30.6	1.29	279.2	183.6
S3.009	34.57	18.41	74.170	1.971	0.0	0.0	36.9	1.29	279.0	221.4
S9.000	47.47	9.84	76.425	0.067	0.0	0.0	1.7	0.15	18.5	10.3
S9.001	47.42	9.86	76.349	0.067	0.0	0.0	1.7	2.03	35.9	10.3
S3.010	34.17	18.82	74.081	2.038	0.0	0.0	37.7	1.29	278.3	226.3
S10.000	50.00	3.38	75.155	0.040	0.0	0.0	1.1	1.69	67.3	6.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S11.000	25.718	0.643	40.0	0.018	3.00	0.0	0.600		o	225	Pipe/Conduit	
S11.001	15.756	0.263	59.9	0.035	0.00	0.0	0.600		o	225	Pipe/Conduit	
S10.001	11.035	0.331	33.3	0.034	0.00	0.0	0.600		o	225	Pipe/Conduit	
S3.011	10.768	0.036	299.1	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S12.000	24.325	0.608	40.0	0.011	3.00	0.0	0.600		o	225	Pipe/Conduit	
S12.001	12.052	0.500	24.1	0.028	0.00	0.0	0.600		o	225	Pipe/Conduit	
S3.012	11.435	0.038	300.9	0.036	0.00	0.0	0.600		o	600	Pipe/Conduit	
S3.013	11.575	0.039	296.8	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S13.000	6.737	0.008	842.1	0.023	3.00	0.0		0.045	4 \=/	500	1:4 Swale	
S13.001	4.659	0.006	776.5	0.000	0.00	0.0		0.045	4 \=/	500	1:4 Swale	
S13.002	3.677	2.043	1.8	0.000	0.00	0.0		0.045	o	150	Pipe/Conduit	
S3.014	10.821	0.036	300.6	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S11.000	50.00	3.21	75.425	0.018	0.0	0.0	0.5	2.07	82.5	2.9
S11.001	50.00	3.36	74.782	0.053	0.0	0.0	1.4	1.69	67.3	8.6
S10.001	50.00	3.46	74.519	0.127	0.0	0.0	3.4	2.27	90.4	20.6
S3.011	34.04	18.94	73.978	2.165	0.0	0.0	39.9	1.40	396.6	239.5
S12.000	50.00	3.20	75.425	0.011	0.0	0.0	0.3	2.07	82.5	1.8
S12.001	50.00	3.27	74.817	0.039	0.0	0.0	1.1	2.68	106.4	6.3
S3.012	33.91	19.08	73.942	2.240	0.0	0.0	41.1	1.40	395.4	246.8
S3.013	33.78	19.22	73.904	2.240	0.0	0.0	41.1	1.41	398.2	246.8
S13.000	50.00	3.78	76.215	0.023	0.0	0.0	0.6	0.14	18.0	3.7
S13.001	50.00	4.25	76.207	0.023	0.0	0.0	0.6	0.17	27.4	3.7
S13.002	50.00	4.28	76.201	0.023	0.0	0.0	0.6	1.86	32.8	3.7
S3.014	33.66	19.35	73.865	2.262	0.0	0.0	41.2	1.40	395.7	247.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.015	8.909	0.030	297.0	0.079	0.00	0.0	0.600		o	600	Pipe/Conduit	
S14.000	14.179	0.105	135.0	0.009	3.00	0.0		0.045	4 \=/	600	1:4 Swale	
S14.001	3.677	1.839	2.0	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit	
S3.016	13.487	0.045	299.7	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S15.000	55.038	0.275	200.1	0.183	3.00	0.0	0.600		o	225	Pipe/Conduit	
S15.001	50.950	0.255	199.8	0.183	0.00	0.0	0.600		o	300	Pipe/Conduit	
S16.000	12.107	0.015	807.1	0.154	3.00	0.0		0.045	4 \=/	500	1:4 Swale	
S16.001	28.931	0.036	803.6	0.000	0.00	0.0		0.045	4 \=/	500	1:4 Swale	
S16.002	105.113	0.131	802.4	0.020	0.00	0.0		0.045	4 \=/	500	1:4 Swale	
S16.003	1.265	0.002	632.6	0.000	0.00	0.0		0.045	4 \=/	500	1:4 Swale	
S16.004	23.985	0.030	799.5	0.000	0.00	0.0		0.045	4 \=/	500	1:4 Swale	
S16.005	5.677	0.007	811.0	0.000	0.00	0.0		0.045	4 \=/	500	1:4 Swale	
S17.000	9.281	0.031	299.4	0.002	3.00	0.0		0.045	4 \=/	500	1:4 Swale	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.015	33.56	19.45	73.829	2.341	0.0	0.0	42.6	1.41	398.1	255.3
S14.000	50.00	3.64	76.605	0.009	0.0	0.0	0.3	0.37	50.6	1.5
S14.001	50.00	3.65	76.500	0.009	0.0	0.0	0.3	7.18	126.9	1.5
S3.016	33.41	19.61	73.799	2.351	0.0	0.0	42.6	1.40	396.2	255.3
S15.000	50.00	4.00	75.050	0.183	0.0	0.0	5.0	0.92	36.6	29.8
S15.001	50.00	4.76	74.775	0.367	0.0	0.0	9.9	1.11	78.4	59.6
S16.000	50.00	4.24	76.023	0.154	0.0	0.0	4.2	0.16	26.9	25.1
S16.001	50.00	7.19	76.008	0.154	0.0	0.0	4.2	0.16	26.9	25.1
S16.002	35.08	17.92	75.972	0.175	0.0	0.0	4.2	0.16	26.9	25.1
S16.003	34.96	18.03	75.841	0.175	0.0	0.0	4.2	0.18	30.4	25.1
S16.004	32.62	20.48	75.839	0.175	0.0	0.0	4.2	0.16	27.0	25.1
S16.005	32.12	21.06	75.809	0.175	0.0	0.0	4.2	0.16	26.8	25.1
S17.000	50.00	3.58	76.023	0.002	0.0	0.0	0.1	0.27	44.1	0.4

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S16.006	6.942	0.347	20.0	0.000	0.00	0.0		0.045	o	225	Pipe/Conduit	
S15.002	12.426	0.124	100.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S15.003	20.722	0.207	100.1	0.019	0.00	0.0	0.600		o	300	Pipe/Conduit	
S3.017	11.584	0.039	297.0	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S18.000	6.275	0.141	44.5	0.014	3.00	0.0		0.045	4 \=/	600	1:4 Swale	
S18.001	6.625	1.656	4.0	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit	
S3.018	18.671	0.062	301.2	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S3.019	10.769	0.036	299.1	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S19.000	29.627	0.296	100.1	0.048	3.00	0.0	0.600		o	150	Pipe/Conduit	
S19.001	10.001	0.100	100.0	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit	
S19.002	3.390	0.034	99.7	0.082	0.00	0.0	0.600		o	225	Pipe/Conduit	
S3.020	8.810	0.040	220.3	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S3.021	8.541	0.028	305.0	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S16.006	31.99	21.22	75.802	0.177	0.0	0.0	4.2	0.73	29.0	25.1
S15.002	31.88	21.35	74.520	0.544	0.0	0.0	9.9	1.57	111.0	59.6
S15.003	31.70	21.57	74.396	0.563	0.0	0.0	9.9	1.57	111.1	59.6
S3.017	31.59	21.71	73.754	2.914	0.0	0.0	49.9	1.41	398.0	299.1
S18.000	50.00	3.16	76.341	0.014	0.0	0.0	0.4	0.64	88.1	2.4
S18.001	50.00	3.19	76.200	0.014	0.0	0.0	0.4	5.07	89.7	2.4
S3.018	31.41	21.93	73.715	2.928	0.0	0.0	49.9	1.40	395.3	299.1
S3.019	31.31	22.06	73.653	2.928	0.0	0.0	49.9	1.40	396.6	299.1
S19.000	50.00	3.49	74.500	0.048	0.0	0.0	1.3	1.00	17.7	7.8
S19.001	50.00	3.66	74.204	0.048	0.0	0.0	1.3	1.00	17.8	7.8
S19.002	50.00	3.70	74.029	0.130	0.0	0.0	3.5	1.31	52.1	21.2
S3.020	31.24	22.15	73.617	3.058	0.0	0.0	51.7	1.64	462.8	310.5
S3.021	31.16	22.25	73.577	3.058	0.0	0.0	51.7	1.39	392.7	310.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.022	32.754	0.066	496.3	0.237	0.00	0.0	0.600		o	900	Pipe/Conduit	
S3.023	15.623	0.031	504.0	0.000	0.00	0.0	0.600		o	900	Pipe/Conduit	
S3.024	11.534	0.023	501.5	0.000	0.00	0.0	0.600		o	900	Pipe/Conduit	
S3.025	7.519	0.215	35.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S3.026	20.195	0.505	40.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.022	30.86	22.64	73.548	3.295	0.0	0.0	55.1	1.40	890.4	330.4
S3.023	30.71	22.83	73.482	3.295	0.0	0.0	55.1	1.39	883.5	330.4
S3.024	30.61	22.97	73.451	3.295	0.0	0.0	55.1	1.39	885.7	330.4
S3.025	30.57	23.02	73.428	3.295	0.0	0.0	55.1	2.22	88.3«	330.4
S3.026	30.45	23.18	73.213	3.295	0.0	0.0	55.1	2.07	82.5«	330.4

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	o	375	S1	76.640	75.365	0.900	Open Manhole	1350
S3.001	o	375	S2	76.700	75.252	1.073	Open Manhole	1350
S3.002	o	375	S3	76.660	75.159	1.126	Open Manhole	1350
S3.003	o	375	S4	76.660	74.992	1.293	Open Manhole	1350
S3.004	o	375	S5	76.660	74.856	1.429	Open Manhole	1350
S4.000	o	375	S6	76.430	75.005	1.050	Open Manhole	1350
S4.001	o	375	S7	76.430	74.721	1.334	Open Manhole	1350
S4.002	o	375	S8	76.430	74.680	1.375	Open Manhole	1350
S3.005	o	450	S9	76.430	74.657	1.323	Open Manhole	1350
S3.006	o	525	S10	76.667	74.523	1.619	Open Manhole	1500
S5.000	o	375	S11	76.430	74.855	1.200	Open Manhole	1350
S5.001	o	375	S12	76.430	74.745	1.310	Open Manhole	1350
S6.000	o	450	S13	76.310	74.960	0.900	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	22.561	200.0	S2	76.700	75.252	1.073	Open Manhole	1350
S3.001	18.677	200.0	S3	76.660	75.159	1.126	Open Manhole	1350
S3.002	33.300	200.0	S4	76.660	74.992	1.293	Open Manhole	1350
S3.003	27.200	200.0	S5	76.660	74.856	1.429	Open Manhole	1350
S3.004	30.424	200.0	S9	76.430	74.704	1.351	Open Manhole	1350
S4.000	85.240	300.1	S7	76.430	74.721	1.334	Open Manhole	1350
S4.001	12.169	296.8	S8	76.430	74.680	1.375	Open Manhole	1350
S4.002	6.772	294.4	S9	76.430	74.657	1.398	Open Manhole	1350
S3.005	40.195	300.0	S10	76.667	74.523	1.694	Open Manhole	1500
S3.006	56.354	299.8	S18	76.550	74.335	1.690	Open Manhole	1500
S5.000	27.436	250.0	S12	76.430	74.745	1.310	Open Manhole	1350
S5.001	37.989	214.3	S17	76.430	74.568	1.487	Open Manhole	1500
S6.000	69.226	200.0	S15	76.400	74.614	1.336	Open Manhole	1350

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	4 \=/	500	SSwale Node 1	76.430	76.113	0.167	Junction	
S7.001	4 \=/	500	SSwale Node 2	76.430	76.103	0.177	Junction	
S7.002	4 \=/	500	SSwale Node 3	76.430	75.981	0.299	Junction	
S7.003	4 \=/	500	SSwale Node 4	76.430	75.980	0.300	Junction	
S7.004	4 \=/	500	SSwale Node 5	76.430	75.956	0.324	Junction	
S7.005	4 \=/	500	SSwale Node 6	76.340	75.951	0.239	Junction	
S7.006	o	225	S14	76.340	75.944	0.171	Junction	
S6.001	o	450	S15	76.400	74.614	1.336	Open Manhole	1350
S6.002	o	525	S16	76.430	74.481	1.424	Open Manhole	1500
S5.002	o	525	S17	76.430	74.418	1.487	Open Manhole	1500
S3.007	o	525	S18	76.550	74.335	1.690	Open Manhole	1500
S8.000	4 \=/	500	SSwale Node 7	76.530	76.405	-0.025	Junction	
S8.001	4 \=/	500	SSwale Node 8	76.550	76.397	0.003	Junction	
S8.002	o	150	S19	76.550	76.391	0.009	Junction	

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	8.164	816.4	SSwale Node 2	76.430	76.103	0.177	Junction	
S7.001	97.966	803.0	SSwale Node 3	76.430	75.981	0.299	Junction	
S7.002	0.897	896.9	SSwale Node 4	76.430	75.980	0.300	Junction	
S7.003	19.444	810.2	SSwale Node 5	76.430	75.956	0.324	Junction	
S7.004	4.239	847.7	SSwale Node 6	76.340	75.951	0.239	Junction	
S7.005	4.747	791.2	S14	76.340	75.945	0.245	Junction	
S7.006	7.750	20.0	S15	76.400	75.556	0.619	Open Manhole	1350
S6.001	11.546	200.0	S16	76.430	74.556	1.424	Open Manhole	1500
S6.002	12.680	201.3	S17	76.430	74.418	1.487	Open Manhole	1500
S5.002	14.010	150.0	S18	76.550	74.325	1.700	Open Manhole	1500
S3.007	2.755	300.0	SNode 1	76.550	74.326	1.699	Junction	
S8.000	6.754	844.3	SSwale Node 8	76.550	76.397	0.003	Junction	
S8.001	4.402	733.7	S19	76.550	76.391	0.009	Junction	
S8.002	3.472	2.0	SNode 1	76.550	74.655	1.745	Junction	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.008	o	525	SNode 1	76.550	74.326	1.699	Junction	
S3.009	o	525	S20	76.550	74.170	1.855	Open Manhole	1500
S9.000	4 \=/	500	SSwale Node 9	76.550	76.425	-0.025	Junction	
S9.001	o	150	S21	76.550	76.349	0.051	Junction	
S3.010	o	525	S22	76.550	74.081	1.944	Open Manhole	1500
S10.000	o	225	S23	76.800	75.155	1.420	Open Manhole	1200
S11.000	o	225	S24	76.850	75.425	1.200	Open Manhole	1200
S11.001	o	225	S25	76.050	74.782	1.043	Open Manhole	1200
S10.001	o	225	S26	76.050	74.519	1.306	Open Manhole	1200
S3.011	o	600	S27	76.550	73.978	1.972	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.008	46.665	299.1	S20	76.550	74.170	1.855	Open Manhole	1500
S3.009	26.662	299.6	S22	76.550	74.081	1.944	Open Manhole	1500
S9.000	60.720	798.9	S21	76.550	76.349	0.051	Junction	
S9.001	2.955	1.5	S22	76.550	74.379	2.021	Open Manhole	1500
S3.010	31.013	301.1	S27	76.550	73.978	2.047	Open Manhole	1500
S10.000	38.156	60.0	S26	76.050	74.519	1.306	Open Manhole	1200
S11.000	25.718	40.0	S25	76.050	74.782	1.043	Open Manhole	1200
S11.001	15.756	59.9	S26	76.050	74.519	1.306	Open Manhole	1200
S10.001	11.035	33.3	S27	76.550	74.188	2.137	Open Manhole	1500
S3.011	10.768	299.1	S30	76.340	73.942	1.798	Open Manhole	1500

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S12.000	o	225	S28	76.850	75.425	1.200	Open Manhole	1200
S12.001	o	225	S29	76.340	74.817	1.298	Open Manhole	1200
S3.012	o	600	S30	76.340	73.942	1.798	Open Manhole	1500
S3.013	o	600	S31	76.800	73.904	2.296	Open Manhole	1500
S13.000	4 \=/	500	SSwale Node 10	76.340	76.215	-0.025	Junction	
S13.001	4 \=/	500	SSwale Node 11	76.800	76.207	0.443	Junction	
S13.002	o	150	S32	76.750	76.201	0.399	Junction	
S3.014	o	600	SNode 2	76.730	73.865	2.265	Junction	
S3.015	o	600	S33	76.730	73.829	2.301	Open Manhole	1500
S14.000	4 \=/	600	SSwale Node 12	76.730	76.605	-0.025	Junction	
S14.001	o	150	S34	76.730	76.500	0.080	Junction	
S3.016	o	600	SNode 3	76.630	73.799	2.231	Junction	

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S12.000	24.325	40.0	S29	76.340	74.817	1.298	Open Manhole	1200
S12.001	12.052	24.1	S30	76.340	74.317	1.798	Open Manhole	1500
S3.012	11.435	300.9	S31	76.800	73.904	2.296	Open Manhole	1500
S3.013	11.575	296.8	SNode 2	76.730	73.865	2.265	Junction	
S13.000	6.737	842.1	SSwale Node 11	76.800	76.207	0.443	Junction	
S13.001	4.659	776.5	S32	76.750	76.201	0.399	Junction	
S13.002	3.677	1.8	SNode 2	76.730	74.158	2.422	Junction	
S3.014	10.821	300.6	S33	76.730	73.829	2.301	Open Manhole	1500
S3.015	8.909	297.0	SNode 3	76.630	73.799	2.231	Junction	
S14.000	14.179	135.0	S34	76.730	76.500	0.080	Junction	
S14.001	3.677	2.0	SNode 3	76.630	74.661	1.819	Junction	
S3.016	13.487	299.7	S40	76.630	73.754	2.276	Open Manhole	1500

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	o	225	S35	76.550	75.050	1.275	Open Manhole	1200
S15.001	o	300	S36	76.550	74.775	1.475	Open Manhole	1200
S16.000	4 \=/	500	SSwale Node 13	76.340	76.023	0.167	Junction	
S16.001	4 \=/	500	SSwale Node 14	76.340	76.008	0.182	Junction	
S16.002	4 \=/	500	SSwale Node 15	76.340	75.972	0.218	Junction	
S16.003	4 \=/	500	SSwale Node 16	76.550	75.841	0.559	Junction	
S16.004	4 \=/	500	SSwale Node 17	76.550	75.839	0.561	Junction	
S16.005	4 \=/	500	SSwale Node 18	76.550	75.809	0.591	Junction	
S17.000	4 \=/	500	SSwale Node 19	76.550	76.023	0.377	Junction	
S16.006	o	225	S37	76.550	75.802	0.523	Junction	
S15.002	o	300	S38	76.550	74.520	1.730	Open Manhole	1200
S15.003	o	300	S39	76.630	74.396	1.934	Open Manhole	1200
S3.017	o	600	S40	76.630	73.754	2.276	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	55.038	200.1	S36	76.550	74.775	1.550	Open Manhole	1200
S15.001	50.950	199.8	S38	76.550	74.520	1.730	Open Manhole	1200
S16.000	12.107	807.1	SSwale Node 14	76.340	76.008	0.182	Junction	
S16.001	28.931	803.6	SSwale Node 15	76.340	75.972	0.218	Junction	
S16.002	105.113	802.4	SSwale Node 16	76.550	75.841	0.559	Junction	
S16.003	1.265	632.6	SSwale Node 17	76.550	75.839	0.561	Junction	
S16.004	23.985	799.5	SSwale Node 18	76.550	75.809	0.591	Junction	
S16.005	5.677	811.0	S37	76.550	75.802	0.598	Junction	
S17.000	9.281	299.4	S37	76.550	75.992	0.408	Junction	
S16.006	6.942	20.0	S38	76.550	75.455	0.870	Open Manhole	1200
S15.002	12.426	100.2	S39	76.630	74.396	1.934	Open Manhole	1200
S15.003	20.722	100.1	S40	76.630	74.189	2.141	Open Manhole	1500
S3.017	11.584	297.0	SNode 4	76.200	73.715	1.885	Junction	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S18.000	4 \=/	600	SSwale Node 20	76.466	76.341	-0.025	Junction	
S18.001	o	150	SSwale Node 21	76.466	76.200	0.116	Junction	
S3.018	o	600	SNode 4	76.200	73.715	1.885	Junction	
S3.019	o	600	S41	76.200	73.653	1.947	Open Manhole	1500
S19.000	o	150	S42	76.466	74.500	1.816	Open Manhole	1200
S19.001	o	150	S43	76.166	74.204	1.812	Open Manhole	1200
S19.002	o	225	S44	75.991	74.029	1.737	Open Manhole	1200
S3.020	o	600	S45	76.166	73.617	1.949	Open Manhole	1500
S3.021	o	600	S46	76.155	73.577	1.978	Open Manhole	1500
S3.022	o	900	SPond Inlet	75.405	73.548	0.957	Open Manhole	1800
S3.023	o	900	SPond aux.1	75.405	73.482	1.023	Open Manhole	1800
S3.024	o	900	SPond aux.2	75.405	73.451	1.054	Open Manhole	1800
S3.025	o	225	SPond Outlet	75.405	73.428	1.752	Open Manhole	1800
S3.026	o	225	S47	75.410	73.213	1.972	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S18.000	6.275	44.5	SSwale Node 21	76.466	76.200	0.116	Junction	
S18.001	6.625	4.0	SNode 4	76.200	74.544	1.506	Junction	
S3.018	18.671	301.2	S41	76.200	73.653	1.947	Open Manhole	1500
S3.019	10.769	299.1	S45	76.166	73.617	1.949	Open Manhole	1500
S19.000	29.627	100.1	S43	76.166	74.204	1.812	Open Manhole	1200
S19.001	10.001	100.0	S44	75.991	74.104	1.737	Open Manhole	1200
S19.002	3.390	99.7	S45	76.166	73.995	1.946	Open Manhole	1500
S3.020	8.810	220.3	S46	76.155	73.577	1.978	Open Manhole	1500
S3.021	8.541	305.0	SPond Inlet	75.405	73.549	1.256	Open Manhole	1800
S3.022	32.754	496.3	SPond aux.1	75.405	73.482	1.023	Open Manhole	1800
S3.023	15.623	504.0	SPond aux.2	75.405	73.451	1.054	Open Manhole	1800
S3.024	11.534	501.5	SPond Outlet	75.405	73.428	1.077	Open Manhole	1800
S3.025	7.519	35.0	S47	75.410	73.213	1.972	Open Manhole	1200
S3.026	20.195	40.0	S	75.410	72.708	2.477	Open Manhole	0

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
3.000	Classification	Footpath	95	0.029	0.027	0.027
	Classification	Porous Carpark	50	0.006	0.003	0.030
	Classification	Porous Carpark	50	0.006	0.003	0.034
	Classification	Porous Carpark	50	0.004	0.002	0.036
	Classification	Green Roof	40	0.058	0.023	0.059
3.001	Classification	Grass	40	0.004	0.002	0.002
3.002	Classification	Roof	100	0.188	0.188	0.188
3.003	-	-	100	0.000	0.000	0.000
3.004	Classification	Roof	100	0.190	0.190	0.190
4.000	Classification	Road	100	0.051	0.051	0.051
	Classification	Footpath	95	0.002	0.002	0.053
	Classification	Concrete Slab	100	0.170	0.170	0.223
	Classification	Grass	40	0.022	0.009	0.232
4.001	-	-	100	0.000	0.000	0.000
4.002	-	-	100	0.000	0.000	0.000
3.005	-	-	100	0.000	0.000	0.000
3.006	-	-	100	0.000	0.000	0.000
5.000	Classification	Road	100	0.014	0.014	0.014
	Classification	Grass	40	0.001	0.000	0.015
	Classification	Footpath	95	0.005	0.004	0.019
	Classification	Concrete Slab	100	0.078	0.078	0.097
	Classification	Grass	40	0.000	0.000	0.097
5.001	-	-	100	0.000	0.000	0.000
6.000	Classification	Road	100	0.053	0.053	0.053
	Classification	Concrete Slab	100	0.225	0.225	0.278
	Classification	Concrete Slab	100	0.024	0.024	0.303
	Classification	Grass	40	0.010	0.004	0.306
7.000	Classification	Road	100	0.076	0.076	0.076
	Classification	Grass	40	0.143	0.057	0.134
	Classification	Grass	40	0.005	0.002	0.135
	Classification	Footpath	95	0.003	0.002	0.138
7.001	Classification	Footpath	95	0.006	0.006	0.006
	Classification	Grass	40	0.003	0.001	0.007
	Classification	Grass	40	0.004	0.002	0.008
7.002	Classification	Grass	40	0.001	0.000	0.000
	Classification	Grass	40	0.003	0.001	0.001
	Classification	Footpath	95	0.003	0.003	0.004
7.003	-	-	100	0.000	0.000	0.000
7.004	-	-	100	0.000	0.000	0.000
7.005	-	-	100	0.000	0.000	0.000
7.006	-	-	100	0.000	0.000	0.000
6.001	-	-	100	0.000	0.000	0.000
6.002	-	-	100	0.000	0.000	0.000
5.002	-	-	100	0.000	0.000	0.000
3.007	Classification	Roof	100	0.181	0.181	0.181

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification	Roof	100	0.183	0.183	0.364
8.000	Classification	Footpath	95	0.002	0.002	0.002
	Classification	Footpath	95	0.002	0.002	0.004
	Classification	Grass	40	0.008	0.003	0.007
	Classification	Grass	40	0.003	0.001	0.009
	Classification	Road	100	0.010	0.010	0.018
8.001	-	-	100	0.000	0.000	0.000
8.002	-	-	100	0.000	0.000	0.000
3.008	-	-	100	0.000	0.000	0.000
3.009	Classification	Roof	100	0.181	0.181	0.181
	Classification	Roof	100	0.183	0.183	0.364
9.000	Classification	Grass	40	0.030	0.012	0.012
	Classification	Grass	40	0.013	0.005	0.017
	Classification	Footpath	95	0.008	0.008	0.025
	Classification	Footpath	95	0.008	0.007	0.032
	Classification	Road	100	0.034	0.034	0.067
9.001	-	-	100	0.000	0.000	0.000
3.010	-	-	100	0.000	0.000	0.000
10.000	Classification	Green Roof	40	0.034	0.014	0.014
	Classification	Footpath	95	0.021	0.020	0.033
	Classification	Porous Carpark	50	0.006	0.003	0.037
	Classification	Porous Carpark	50	0.005	0.003	0.039
	Classification	Grass	40	0.003	0.001	0.040
11.000	Classification	Concrete Slab	100	0.014	0.014	0.014
	Classification	Footpath	95	0.004	0.004	0.018
11.001	Classification	Grass	40	0.003	0.001	0.001
	Classification	Road	100	0.034	0.034	0.035
10.001	Classification	Concrete Slab	100	0.028	0.028	0.028
	Classification	Footpath	95	0.004	0.003	0.032
	Classification	Grass	40	0.006	0.002	0.034
3.011	-	-	100	0.000	0.000	0.000
12.000	Classification	Concrete Slab	100	0.011	0.011	0.011
12.001	Classification	Concrete Slab	100	0.028	0.028	0.028
3.012	Classification	Grass	40	0.001	0.000	0.000
	Classification	Grass	40	0.001	0.000	0.001
	Classification	Road	100	0.031	0.031	0.032
	Classification	Footpath	95	0.004	0.004	0.036
3.013	-	-	100	0.000	0.000	0.000
13.000	Classification	Road	100	0.016	0.016	0.016
	Classification	Footpath	95	0.004	0.004	0.020
	Classification	Grass	40	0.007	0.003	0.023
13.001	-	-	100	0.000	0.000	0.000
13.002	-	-	100	0.000	0.000	0.000
3.014	-	-	100	0.000	0.000	0.000
3.015	Classification	Road	100	0.047	0.047	0.047

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification	Footpath	95	0.004	0.004	0.051
	Classification	Green Roof	40	0.043	0.017	0.068
	Classification	Footpath	95	0.008	0.008	0.076
	Classification	Grass	40	0.006	0.002	0.078
	Classification	Grass	40	0.002	0.001	0.079
	Classification	Grass	40	0.001	0.000	0.079
14.000	Classification	Grass	40	0.010	0.004	0.004
	Classification	Footpath	95	0.006	0.005	0.009
14.001	-	-	100	0.000	0.000	0.000
3.016	-	-	100	0.000	0.000	0.000
15.000	Classification	Roof	100	0.183	0.183	0.183
15.001	Classification	Roof	100	0.183	0.183	0.183
16.000	Classification	Road	100	0.095	0.095	0.095
	Classification	Grass	40	0.148	0.059	0.154
16.001	-	-	100	0.000	0.000	0.000
16.002	Classification	Grass	40	0.001	0.000	0.000
	Classification	Grass	40	0.016	0.006	0.006
	Classification	Footpath	95	0.015	0.014	0.020
16.003	-	-	100	0.000	0.000	0.000
16.004	-	-	100	0.000	0.000	0.000
16.005	-	-	100	0.000	0.000	0.000
17.000	Classification	Footpath	95	0.002	0.002	0.002
16.006	-	-	100	0.000	0.000	0.000
15.002	-	-	100	0.000	0.000	0.000
15.003	Classification	Green Roof	40	0.048	0.019	0.019
3.017	-	-	100	0.000	0.000	0.000
18.000	Classification	Grass	40	0.003	0.001	0.001
	Classification	Road	100	0.006	0.006	0.007
	Classification	Footpath	95	0.007	0.007	0.014
	Classification	Porous Carpark	50	0.000	0.000	0.014
	Classification	Porous Carpark	50	0.000	0.000	0.014
18.001	-	-	100	0.000	0.000	0.000
3.018	-	-	100	0.000	0.000	0.000
3.019	-	-	100	0.000	0.000	0.000
19.000	Classification	Roof	100	0.048	0.048	0.048
19.001	-	-	100	0.000	0.000	0.000
19.002	Classification	Footpath	95	0.012	0.011	0.011
	Classification	Footpath	95	0.005	0.005	0.016
	Classification	Footpath	95	0.003	0.003	0.018
	Classification	Footpath	95	0.005	0.005	0.023
	Classification	Footpath	95	0.003	0.003	0.026
	Classification	Porous Carpark	50	0.081	0.041	0.067
	Classification	Grass	40	0.003	0.001	0.068
	Classification	Grass	40	0.000	0.000	0.068
	Classification	Grass	40	0.000	0.000	0.068

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification	Grass	40	0.002	0.001	0.069
	Classification	Road	100	0.006	0.006	0.075
	Classification	Road	100	0.005	0.005	0.081
	Classification	Grass	40	0.004	0.001	0.082
3.020	-	-	100	0.000	0.000	0.000
3.021	-	-	100	0.000	0.000	0.000
3.022	Classification	Grass	40	0.498	0.199	0.199
	Classification	Grass	40	0.008	0.003	0.202
	Classification	Grass	40	0.004	0.002	0.204
	Classification	Footpath	95	0.014	0.013	0.217
	Classification	Road	100	0.019	0.019	0.237
3.023	-	-	100	0.000	0.000	0.000
3.024	-	-	100	0.000	0.000	0.000
3.025	-	-	100	0.000	0.000	0.000
3.026	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				4.054	3.295	3.295

Simulation Criteria for Storm

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.900	Storm Duration (mins)	30
Ratio R	0.272		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SPond Outlet, DS/PN: S3.025, Volume (m³): 11.2

Unit Reference	MD-SHE-0121-8100-1750-8100
Design Head (m)	1.750
Design Flow (l/s)	8.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	121
Invert Level (m)	73.428
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.750	8.1	Kick-Flo®	1.071	6.4
Flush-Flo™	0.525	8.1	Mean Flow over Head Range	-	7.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.3	1.200	6.8	3.000	10.4	7.000	15.6
0.200	7.0	1.400	7.3	3.500	11.2	7.500	16.1
0.300	7.7	1.600	7.8	4.000	12.0	8.000	16.6
0.400	8.0	1.800	8.2	4.500	12.6	8.500	17.1
0.500	8.1	2.000	8.6	5.000	13.3	9.000	17.6
0.600	8.1	2.200	9.0	5.500	13.9	9.500	18.1
0.800	7.8	2.400	9.4	6.000	14.5		
1.000	7.0	2.600	9.7	6.500	15.1		

Storage Structures for Storm

Tank or Pond Manhole: SPond Outlet, DS/PN: S3.025

Invert Level (m) 73.428

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1306.4	1.500	2109.3	1.850	2404.2	1.990	3382.4

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.272
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.900	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status ON
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	20, 20, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S3.000	S1	15 Summer	5	+20%	100/15 Summer		
S3.001	S2	15 Summer	5	+20%	100/15 Summer		
S3.002	S3	15 Winter	5	+20%	30/30 Winter		
S3.003	S4	15 Winter	5	+20%	30/15 Winter		
S3.004	S5	15 Winter	5	+20%	30/15 Summer		
S4.000	S6	15 Summer	5	+20%	30/15 Winter		
S4.001	S7	15 Winter	5	+20%	30/15 Summer		
S4.002	S8	15 Winter	5	+20%	30/15 Summer		
S3.005	S9	15 Winter	5	+20%	30/15 Summer	100/5760 Winter	
S3.006	S10	15 Winter	5	+20%	30/15 Summer		
S5.000	S11	15 Summer	5	+20%	30/15 Winter		
S5.001	S12	30 Winter	5	+20%	30/15 Summer	100/5760 Winter	
S6.000	S13	15 Summer	5	+20%	30/30 Winter		
S7.000	SSwale Node 1	15 Summer	5	+20%			

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S3.000	S1		75.453	-0.287	0.000	0.12			14.3
S3.001	S2		75.352	-0.275	0.000	0.12			14.6
S3.002	S3		75.317	-0.216	0.000	0.37			46.4
S3.003	S4		75.151	-0.217	0.000	0.37			45.5
S3.004	S5		75.072	-0.160	0.000	0.61			76.8
S4.000	S6		75.203	-0.177	0.000	0.45			49.5
S4.001	S7		74.973	-0.123	0.000	0.46			41.0
S4.002	S8		74.961	-0.094	0.000	0.51			39.2
S3.005	S9		74.953	-0.154	0.000	0.67			110.1
S3.006	S10		74.896	-0.152	0.000	0.39			99.1
S5.000	S11		74.976	-0.254	0.000	0.21			23.4
S5.001	S12		74.877	-0.243	0.000	0.14			16.9
S6.000	S13		75.150	-0.260	0.000	0.34			71.7
S7.000	SSwale Node 1		76.286	-0.144	0.000	0.19			31.5

PN	US/MH Name	Status	Level Exceeded
S3.000	S1	OK	
S3.001	S2	OK	
S3.002	S3	OK	
S3.003	S4	OK	
S3.004	S5	OK	
S4.000	S6	OK	
S4.001	S7	OK	
S4.002	S8	OK	
S3.005	S9	OK	
S3.006	S10	OK	
S5.000	S11	OK	
S5.001	S12	OK	
S6.000	S13	OK	
S7.000	SSwale Node 1	FLOOD RISK*	

Level of Service:
No flood risk or flooding

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S7.001	SSwale Node 2	15 Summer	5	+20%			
S7.002	SSwale Node 3	30 Winter	5	+20%			
S7.003	SSwale Node 4	60 Summer	5	+20%			
S7.004	SSwale Node 5	30 Winter	5	+20%			
S7.005	SSwale Node 6	30 Winter	5	+20%			
S7.006	S14	30 Winter	5	+20%	100/30 Winter		
S6.001	S15	30 Winter	5	+20%	30/15 Summer		
S6.002	S16	30 Winter	5	+20%	30/15 Summer	100/1440 Winter	
S5.002	S17	30 Winter	5	+20%	30/15 Summer	100/1440 Winter	
S3.007	S18	30 Winter	5	+20%	30/15 Summer	100/5760 Winter	
S8.000	SSwale Node 7	15 Summer	5	+20%			
S8.001	SSwale Node 8	15 Summer	5	+20%			
S8.002	S19	15 Summer	5	+20%			
S3.008	SNode 1	30 Winter	5	+20%			
S3.009	S20	30 Winter	5	+20%	5/30 Winter		
S9.000	SSwale Node 9	15 Summer	5	+20%			
S9.001	S21	15 Winter	5	+20%			
S3.010	S22	30 Winter	5	+20%	5/15 Winter		
S10.000	S23	15 Summer	5	+20%	100/15 Winter		
S11.000	S24	15 Summer	5	+20%	100/30 Winter		
S11.001	S25	15 Summer	5	+20%	30/15 Winter		
S10.001	S26	15 Summer	5	+20%	30/15 Summer		
S3.011	S27	30 Winter	5	+20%	30/15 Summer		
S12.000	S28	15 Summer	5	+20%	100/30 Winter		
S12.001	S29	15 Summer	5	+20%	30/30 Winter		
S3.012	S30	30 Winter	5	+20%	30/15 Summer		
S3.013	S31	30 Winter	5	+20%	30/15 Summer		
S13.000	SSwale Node 10	15 Summer	5	+20%			
S13.001	SSwale Node 11	15 Summer	5	+20%			
S13.002	S32	15 Summer	5	+20%			
S3.014	SNode 2	30 Winter	5	+20%			
S3.015	S33	30 Winter	5	+20%	5/30 Winter		
S14.000	SSwale Node 12	15 Summer	5	+20%			
S14.001	S34	15 Summer	5	+20%			
S3.016	SNode 3	30 Winter	5	+20%	5/30 Winter		
S15.000	S35	15 Summer	5	+20%	5/15 Summer		
S15.001	S36	15 Winter	5	+20%	30/15 Summer		
S16.000	SSwale Node 13	15 Summer	5	+20%			
S16.001	SSwale Node 14	15 Summer	5	+20%			
S16.002	SSwale Node 15	15 Winter	5	+20%			
S16.003	SSwale Node 16	30 Winter	5	+20%			
S16.004	SSwale Node 17	60 Summer	5	+20%			

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S7.001	SSwale Node 2		76.266	-0.164	0.000	0.17			25.6
S7.002	SSwale Node 3		76.112	-0.318	0.000	0.01			15.5
S7.003	SSwale Node 4		76.116	-0.314	0.000	0.06			13.9
S7.004	SSwale Node 5		76.076	-0.354	0.000	0.02			14.5
S7.005	SSwale Node 6		76.068	-0.272	0.000	0.03			14.4
S7.006	S14		76.056	-0.113	0.000	0.50			14.4
S6.001	S15		74.891	-0.173	0.000	0.34			56.8
S6.002	S16		74.880	-0.126	0.000	0.22			53.6
S5.002	S17		74.872	-0.071	0.000	0.24			59.6
S3.007	S18		74.860	0.000	0.000	1.01			173.4
S8.000	SSwale Node 7		76.468	-0.062	0.000	0.15			4.1
S8.001	SSwale Node 8		76.452	-0.098	0.000	0.07			3.8
S8.002	S19		76.426	-0.115	0.000	0.12			3.9
S3.008	SNode 1		74.780	-0.071	0.000	0.63			175.5
S3.009	S20		74.719	0.024	0.000	0.93			212.3
S9.000	SSwale Node 9		76.537	-0.013	0.000	0.69			12.9
S9.001	S21		76.407	-0.092	0.000	0.32			11.5
S3.010	S22		74.644	0.038	0.000	0.93			217.6
S10.000	S23		75.216	-0.164	0.000	0.15			9.6
S11.000	S24		75.461	-0.189	0.000	0.06			4.5
S11.001	S25		74.845	-0.162	0.000	0.17			10.2
S10.001	S26		74.610	-0.134	0.000	0.34			25.9
S3.011	S27		74.555	-0.023	0.000	0.89			227.7
S12.000	S28		75.453	-0.197	0.000	0.04			2.8
S12.001	S29		74.860	-0.182	0.000	0.08			7.4
S3.012	S30		74.523	-0.019	0.000	0.91			234.0
S3.013	S31		74.488	-0.016	0.000	0.89			234.1
S13.000	SSwale Node 10		76.288	-0.052	0.000	0.19			5.2
S13.001	SSwale Node 11		76.271	-0.529	0.000	0.00			5.2
S13.002	S32		76.241	-0.110	0.000	0.16			5.1
S3.014	SNode 2		74.453	-0.012	0.000	0.68			235.9
S3.015	S33		74.432	0.003	0.000	1.00			242.2
S14.000	SSwale Node 12		76.629	-0.101	0.000	0.05			2.3
S14.001	S34		76.516	-0.134	0.000	0.03			2.3
S3.016	SNode 3		74.401	0.002	0.000	0.70			243.5
S15.000	S35		75.396	0.121	0.000	1.11			39.1
S15.001	S36		75.006	-0.069	0.000	0.93			68.5
S16.000	SSwale Node 13		76.204	-0.136	0.000	0.31			35.2
S16.001	SSwale Node 14		76.175	-0.165	0.000	0.24			31.4
S16.002	SSwale Node 15		76.126	-0.214	0.000	0.13			25.1
S16.003	SSwale Node 16		75.976	-0.574	0.000	0.00			16.6

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S16.004	SSwale Node 17		75.987	-0.563	0.000	0.02			14.8

PN	US/MH Name	Status	Level Exceeded
S7.001	SSwale Node 2	FLOOD RISK*	
S7.002	SSwale Node 3	OK	
S7.003	SSwale Node 4	OK	
S7.004	SSwale Node 5	OK	
S7.005	SSwale Node 6	FLOOD RISK*	
S7.006	S14	FLOOD RISK*	
S6.001	S15	OK	
S6.002	S16	OK	
S5.002	S17	OK	
S3.007	S18	OK	
S8.000	SSwale Node 7	FLOOD RISK*	
S8.001	SSwale Node 8	FLOOD RISK*	
S8.002	S19	FLOOD RISK*	
S3.008	SNode 1	OK*	
S3.009	S20	SURCHARGED	
S9.000	SSwale Node 9	FLOOD RISK*	
S9.001	S21	FLOOD RISK*	
S3.010	S22	SURCHARGED	
S10.000	S23	OK	
S11.000	S24	OK	
S11.001	S25	OK	
S10.001	S26	OK	
S3.011	S27	OK	
S12.000	S28	OK	
S12.001	S29	OK	
S3.012	S30	OK	
S3.013	S31	OK	
S13.000	SSwale Node 10	FLOOD RISK*	
S13.001	SSwale Node 11	OK	
S13.002	S32	OK*	
S3.014	SNode 2	OK*	
S3.015	S33	SURCHARGED	
S14.000	SSwale Node 12	FLOOD RISK*	
S14.001	S34	FLOOD RISK*	
S3.016	SNode 3	SURCHARGED*	

Level of service:
No flood risk or flooding

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S15.000	S35	SURCHARGED	
S15.001	S36	OK	
S16.000	SSwale Node 13	FLOOD RISK*	
S16.001	SSwale Node 14	FLOOD RISK*	
S16.002	SSwale Node 15	FLOOD RISK*	
S16.003	SSwale Node 16	OK	
S16.004	SSwale Node 17	OK	

Level of service:
No flood risk or flooding

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S16.005	SSwale Node 18	30 Winter	5	+20%			
S17.000	SSwale Node 19	15 Summer	5	+20%			
S16.006	S37	30 Winter	5	+20%			
S15.002	S38	15 Winter	5	+20%	30/15 Summer		
S15.003	S39	15 Winter	5	+20%	30/15 Summer		
S3.017	S40	30 Winter	5	+20%	5/15 Winter		
S18.000	SSwale Node 20	15 Summer	5	+20%			
S18.001	SSwale Node 21	15 Summer	5	+20%			
S3.018	SNode 4	30 Winter	5	+20%	5/30 Winter		
S3.019	S41	30 Winter	5	+20%	5/15 Winter		
S19.000	S42	15 Summer	5	+20%	30/15 Summer		
S19.001	S43	15 Summer	5	+20%	30/15 Summer		
S19.002	S44	30 Winter	5	+20%	30/15 Summer		
S3.020	S45	2160 Winter	5	+20%	5/15 Winter		
S3.021	S46	2160 Winter	5	+20%	5/30 Winter		
S3.022	SPond Inlet	2160 Winter	5	+20%	30/960 Winter		
S3.023	SPond aux.1	2160 Winter	5	+20%	30/600 Winter		
S3.024	SPond aux.2	2160 Winter	5	+20%	30/480 Winter		
S3.025	SPond Outlet	2160 Winter	5	+20%	5/30 Summer		
S3.026	S47	960 Summer	5	+20%			

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S16.005	SSwale Node 18		75.933	-0.617	0.000	0.01			15.8
S17.000	SSwale Node 19		76.038	-0.512	0.000	0.00			0.6
S16.006	S37		75.921	-0.106	0.000	0.55			15.9
S15.002	S38		74.721	-0.099	0.000	0.78			69.2
S15.003	S39		74.589	-0.107	0.000	0.74			72.0
S3.017	S40		74.373	0.019	0.000	1.13			296.6
S18.000	SSwale Node 20		76.363	-0.103	0.000	0.04			3.6
S18.001	SSwale Node 21		76.221	-0.129	0.000	0.04			3.6
S3.018	SNode 4		74.324	0.009	0.000	0.86			297.6
S3.019	S41		74.282	0.029	0.000	1.17			297.5
S19.000	S42		74.596	-0.054	0.000	0.68			11.6
S19.001	S43		74.303	-0.051	0.000	0.75			11.9
S19.002	S44		74.239	-0.015	0.000	0.71			21.3
S3.020	S45		74.234	0.017	0.000	0.13			35.8
S3.021	S46		74.233	0.056	0.000	0.15			35.7
S3.022	SPond Inlet		74.232	-0.216	0.000	0.06			38.3

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S3.023	SPond aux.1		74.232	-0.150	0.000	0.09			37.8
S3.024	SPond aux.2		74.231	-0.120	0.000	0.10			37.5
S3.025	SPond Outlet		74.231	0.578	0.000	0.12			8.1
S3.026	S47		73.262	-0.176	0.000	0.11			8.1

PN	US/MH Name	Status	Level Exceeded
S16.005	SSwale Node 18	OK	
S17.000	SSwale Node 19	OK	
S16.006	S37	OK*	
S15.002	S38	OK	
S15.003	S39	OK	
S3.017	S40	SURCHARGED	
S18.000	SSwale Node 20	FLOOD RISK*	
S18.001	SSwale Node 21	FLOOD RISK*	
S3.018	SNode 4	SURCHARGED*	
S3.019	S41	SURCHARGED	
S19.000	S42	OK	
S19.001	S43	OK	
S19.002	S44	OK	
S3.020	S45	SURCHARGED	
S3.021	S46	SURCHARGED	
S3.022	SPond Inlet	OK	
S3.023	SPond aux.1	OK	
S3.024	SPond aux.2	OK	
S3.025	SPond Outlet	SURCHARGED	
S3.026	S47	OK	

Level of service:
No flood risk or flooding

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.272
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.900	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status ON
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	20, 20, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S3.000	S1	30 Winter	30	+20%	100/15 Summer		
S3.001	S2	30 Winter	30	+20%	100/15 Summer		
S3.002	S3	30 Winter	30	+20%	30/30 Winter		
S3.003	S4	30 Winter	30	+20%	30/15 Winter		
S3.004	S5	30 Winter	30	+20%	30/15 Summer		
S4.000	S6	30 Winter	30	+20%	30/15 Winter		
S4.001	S7	30 Winter	30	+20%	30/15 Summer		
S4.002	S8	30 Winter	30	+20%	30/15 Summer		
S3.005	S9	30 Winter	30	+20%	30/15 Summer	100/5760 Winter	
S3.006	S10	30 Winter	30	+20%	30/15 Summer		
S5.000	S11	30 Winter	30	+20%	30/15 Winter		
S5.001	S12	30 Winter	30	+20%	30/15 Summer	100/5760 Winter	
S6.000	S13	30 Winter	30	+20%	30/30 Winter		
S7.000	SSwale Node 1	15 Summer	30	+20%			

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S3.000	S1		75.588	-0.152	0.000	0.13			15.5
S3.001	S2		75.583	-0.044	0.000	0.13			15.7
S3.002	S3		75.579	0.045	0.000	0.51			63.7
S3.003	S4		75.560	0.193	0.000	0.47			58.1
S3.004	S5		75.545	0.313	0.000	0.80			100.5
S4.000	S6		75.564	0.184	0.000	0.53			58.2
S4.001	S7		75.535	0.439	0.000	0.43			38.1
S4.002	S8		75.521	0.466	0.000	0.55			42.9
S3.005	S9		75.513	0.406	0.000	0.70			115.2
S3.006	S10		75.477	0.429	0.000	0.41			102.4
S5.000	S11		75.479	0.249	0.000	0.23			25.4
S5.001	S12		75.472	0.351	0.000	0.16			20.2
S6.000	S13		75.512	0.102	0.000	0.37			78.8
S7.000	SSwale Node 1		76.324	-0.106	0.000	0.28			47.6

PN	US/MH Name	Status	Level Exceeded
S3.000	S1	OK	
S3.001	S2	OK	
S3.002	S3	SURCHARGED	
S3.003	S4	SURCHARGED	
S3.004	S5	SURCHARGED	
S4.000	S6	SURCHARGED	
S4.001	S7	SURCHARGED	
S4.002	S8	SURCHARGED	
S3.005	S9	SURCHARGED	
S3.006	S10	SURCHARGED	
S5.000	S11	SURCHARGED	
S5.001	S12	SURCHARGED	
S6.000	S13	SURCHARGED	
S7.000	SSwale Node 1	FLOOD RISK*	

Level of service:
No flood risk or flooding

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S7.001	SSwale Node 2	15 Summer	30	+20%			
S7.002	SSwale Node 3	30 Winter	30	+20%			
S7.003	SSwale Node 4	60 Summer	30	+20%			
S7.004	SSwale Node 5	30 Winter	30	+20%			
S7.005	SSwale Node 6	30 Winter	30	+20%			
S7.006	S14	30 Winter	30	+20%	100/30 Winter		
S6.001	S15	30 Winter	30	+20%	30/15 Summer		
S6.002	S16	30 Winter	30	+20%	30/15 Summer	100/1440 Winter	
S5.002	S17	30 Winter	30	+20%	30/15 Summer	100/1440 Winter	
S3.007	S18	30 Winter	30	+20%	30/15 Summer	100/5760 Winter	
S8.000	SSwale Node 7	15 Summer	30	+20%			
S8.001	SSwale Node 8	15 Summer	30	+20%			
S8.002	S19	15 Summer	30	+20%			
S3.008	SNode 1	15 Summer	30	+20%			
S3.009	S20	30 Winter	30	+20%	5/30 Winter		
S9.000	SSwale Node 9	15 Summer	30	+20%			
S9.001	S21	15 Winter	30	+20%			
S3.010	S22	30 Winter	30	+20%	5/15 Winter		
S10.000	S23	15 Summer	30	+20%	100/15 Winter		
S11.000	S24	15 Summer	30	+20%	100/30 Winter		
S11.001	S25	30 Winter	30	+20%	30/15 Winter		
S10.001	S26	30 Winter	30	+20%	30/15 Summer		
S3.011	S27	30 Winter	30	+20%	30/15 Summer		
S12.000	S28	15 Summer	30	+20%	100/30 Winter		
S12.001	S29	30 Winter	30	+20%	30/30 Winter		
S3.012	S30	30 Winter	30	+20%	30/15 Summer		
S3.013	S31	30 Winter	30	+20%	30/15 Summer		
S13.000	SSwale Node 10	15 Summer	30	+20%			
S13.001	SSwale Node 11	15 Summer	30	+20%			
S13.002	S32	15 Summer	30	+20%			
S3.014	SNode 2	15 Summer	30	+20%			
S3.015	S33	30 Winter	30	+20%	5/30 Winter		
S14.000	SSwale Node 12	15 Summer	30	+20%			
S14.001	S34	15 Summer	30	+20%			
S3.016	SNode 3	30 Summer	30	+20%	5/30 Winter		
S15.000	S35	15 Summer	30	+20%	5/15 Summer		
S15.001	S36	30 Winter	30	+20%	30/15 Summer		
S16.000	SSwale Node 13	15 Summer	30	+20%			
S16.001	SSwale Node 14	15 Summer	30	+20%			
S16.002	SSwale Node 15	15 Winter	30	+20%			
S16.003	SSwale Node 16	30 Winter	30	+20%			
S16.004	SSwale Node 17	30 Winter	30	+20%			

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S7.001	SSwale Node 2		76.303	-0.127	0.000	0.25			38.1
S7.002	SSwale Node 3		76.139	-0.291	0.000	0.02			22.9
S7.003	SSwale Node 4		76.142	-0.288	0.000	0.09			19.9
S7.004	SSwale Node 5		76.103	-0.327	0.000	0.03			21.5
S7.005	SSwale Node 6		76.096	-0.244	0.000	0.05			21.3
S7.006	S14		76.088	-0.081	0.000	0.73			21.3
S6.001	S15		75.490	0.426	0.000	0.39			64.1
S6.002	S16		75.475	0.469	0.000	0.27			64.9
S5.002	S17		75.463	0.520	0.000	0.36			89.6
S3.007	S18		75.448	0.588	0.000	1.26			216.5
S8.000	SSwale Node 7		76.484	-0.046	0.000	0.23			6.1
S8.001	SSwale Node 8		76.466	-0.084	0.000	0.11			5.9
S8.002	S19		76.436	-0.105	0.000	0.19			6.0
S3.008	SNode 1		74.851	0.000	0.000	0.77			216.3
S3.009	S20		75.351	0.656	0.000	1.15			263.2
S9.000	SSwale Node 9		76.547	-0.003	0.000	0.91			16.9
S9.001	S21		76.421	-0.078	0.000	0.46			16.4
S3.010	S22		75.255	0.649	0.000	1.14			267.6
S10.000	S23		75.230	-0.150	0.000	0.22			14.2
S11.000	S24		75.470	-0.180	0.000	0.09			6.6
S11.001	S25		75.168	0.161	0.000	0.23			13.8
S10.001	S26		75.156	0.412	0.000	0.43			32.7
S3.011	S27		75.135	0.557	0.000	1.07			273.9
S12.000	S28		75.459	-0.191	0.000	0.05			4.1
S12.001	S29		75.102	0.060	0.000	0.11			10.2
S3.012	S30		75.095	0.553	0.000	1.09			282.2
S3.013	S31		75.052	0.548	0.000	1.06			276.8
S13.000	SSwale Node 10		76.305	-0.035	0.000	0.29			7.9
S13.001	SSwale Node 11		76.286	-0.514	0.000	0.01			8.0
S13.002	S32		76.251	-0.100	0.000	0.24			7.9
S3.014	SNode 2		74.465	0.000	0.000	0.80			278.4
S3.015	S33		74.983	0.554	0.000	1.19			287.3
S14.000	SSwale Node 12		76.635	-0.095	0.000	0.07			3.4
S14.001	S34		76.520	-0.130	0.000	0.04			3.5
S3.016	SNode 3		74.811	0.412	0.000	0.82			284.6
S15.000	S35		75.907	0.632	0.000	1.42			49.9
S15.001	S36		75.319	0.244	0.000	1.15			84.9
S16.000	SSwale Node 13		76.243	-0.097	0.000	0.47			53.5
S16.001	SSwale Node 14		76.211	-0.129	0.000	0.36			47.1
S16.002	SSwale Node 15		76.163	-0.177	0.000	0.19			38.0
S16.003	SSwale Node 16		76.005	-0.545	0.000	0.01			24.8

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S16.004	SSwale Node 17		76.010	-0.540	0.000	0.03			24.6

PN	US/MH Name	Status	Level Exceeded
S7.001	SSwale Node 2	FLOOD RISK*	
S7.002	SSwale Node 3	FLOOD RISK*	
S7.003	SSwale Node 4	FLOOD RISK*	
S7.004	SSwale Node 5	OK	
S7.005	SSwale Node 6	FLOOD RISK*	
S7.006	S14	FLOOD RISK*	
S6.001	S15	SURCHARGED	
S6.002	S16	SURCHARGED	
S5.002	S17	SURCHARGED	
S3.007	S18	SURCHARGED	
S8.000	SSwale Node 7	FLOOD RISK*	
S8.001	SSwale Node 8	FLOOD RISK*	
S8.002	S19	FLOOD RISK*	
S3.008	SNode 1	SURCHARGED*	
S3.009	S20	SURCHARGED	
S9.000	SSwale Node 9	FLOOD RISK*	
S9.001	S21	FLOOD RISK*	
S3.010	S22	SURCHARGED	
S10.000	S23	OK	
S11.000	S24	OK	
S11.001	S25	SURCHARGED	
S10.001	S26	SURCHARGED	
S3.011	S27	SURCHARGED	
S12.000	S28	OK	
S12.001	S29	SURCHARGED	
S3.012	S30	SURCHARGED	
S3.013	S31	SURCHARGED	
S13.000	SSwale Node 10	FLOOD RISK*	
S13.001	SSwale Node 11	OK	
S13.002	S32	OK*	
S3.014	SNode 2	SURCHARGED*	
S3.015	S33	SURCHARGED	
S14.000	SSwale Node 12	FLOOD RISK*	
S14.001	S34	FLOOD RISK*	
S3.016	SNode 3	SURCHARGED*	

Level of service:
No flood risk or flooding

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status	Level Exceeded
S15.000	S35	SURCHARGED	
S15.001	S36	SURCHARGED	
S16.000	SSwale Node 13	FLOOD RISK*	
S16.001	SSwale Node 14	FLOOD RISK*	
S16.002	SSwale Node 15	FLOOD RISK*	
S16.003	SSwale Node 16	OK	
S16.004	SSwale Node 17	OK	

Level of service:
No flood risk or flooding

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S16.005	SSwale Node 18	30 Winter	30	+20%			
S17.000	SSwale Node 19	15 Summer	30	+20%			
S16.006	S37	30 Winter	30	+20%			
S15.002	S38	30 Winter	30	+20%	30/15 Summer		
S15.003	S39	30 Winter	30	+20%	30/15 Summer		
S3.017	S40	30 Winter	30	+20%	5/15 Winter		
S18.000	SSwale Node 20	15 Summer	30	+20%			
S18.001	SSwale Node 21	15 Summer	30	+20%			
S3.018	SNode 4	30 Summer	30	+20%	5/30 Winter		
S3.019	S41	30 Winter	30	+20%	5/15 Winter		
S19.000	S42	15 Summer	30	+20%	30/15 Summer		
S19.001	S43	2880 Winter	30	+20%	30/15 Summer		
S19.002	S44	2880 Winter	30	+20%	30/15 Summer		
S3.020	S45	2880 Winter	30	+20%	5/15 Winter		
S3.021	S46	2880 Winter	30	+20%	5/30 Winter		
S3.022	SPond Inlet	2880 Winter	30	+20%	30/960 Winter		
S3.023	SPond aux.1	2880 Winter	30	+20%	30/600 Winter		
S3.024	SPond aux.2	2880 Winter	30	+20%	30/480 Winter		
S3.025	SPond Outlet	2880 Winter	30	+20%	5/30 Summer		
S3.026	S47	120 Summer	30	+20%			

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S16.005	SSwale Node 18		75.966	-0.584	0.000	0.01			23.4
S17.000	SSwale Node 19		76.041	-0.509	0.000	0.00			0.8
S16.006	S37		75.956	-0.071	0.000	0.81			23.4
S15.002	S38		75.135	0.315	0.000	0.97			85.9
S15.003	S39		75.038	0.342	0.000	0.91			88.0
S3.017	S40		74.906	0.552	0.000	1.40			365.5
S18.000	SSwale Node 20		76.369	-0.097	0.000	0.06			5.3
S18.001	SSwale Node 21		76.226	-0.124	0.000	0.07			5.3
S3.018	SNode 4		74.694	0.379	0.000	1.02			352.8
S3.019	S41		74.638	0.385	0.000	1.44			366.9
S19.000	S42		74.677	0.027	0.000	0.96			16.4
S19.001	S43		74.587	0.233	0.000	0.04			0.6
S19.002	S44		74.586	0.332	0.000	0.06			1.7
S3.020	S45		74.586	0.369	0.000	0.14			38.8
S3.021	S46		74.586	0.409	0.000	0.17			38.7
S3.022	SPond Inlet		74.585	0.137	0.000	0.06			41.6

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S3.023	SPond aux.1		74.585	0.203	0.000	0.10			41.0
S3.024	SPond aux.2		74.584	0.233	0.000	0.11			40.7
S3.025	SPond Outlet		74.584	0.931	0.000	0.12			8.1
S3.026	S47		73.262	-0.176	0.000	0.11			8.1

PN	US/MH Name	Status	Level Exceeded
S16.005	SSwale Node 18	OK	
S17.000	SSwale Node 19	OK	
S16.006	S37	OK*	
S15.002	S38	SURCHARGED	
S15.003	S39	SURCHARGED	
S3.017	S40	SURCHARGED	
S18.000	SSwale Node 20	FLOOD RISK*	
S18.001	SSwale Node 21	FLOOD RISK*	
S3.018	SNode 4	SURCHARGED*	
S3.019	S41	SURCHARGED	
S19.000	S42	SURCHARGED	
S19.001	S43	SURCHARGED	
S19.002	S44	SURCHARGED	
S3.020	S45	SURCHARGED	
S3.021	S46	SURCHARGED	
S3.022	SPond Inlet	SURCHARGED	
S3.023	SPond aux.1	SURCHARGED	
S3.024	SPond aux.2	SURCHARGED	
S3.025	SPond Outlet	SURCHARGED	
S3.026	S47	OK	

Level of service:
No flood risk or flooding

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.272
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.900	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status ON
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	20, 20, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S3.000	S1	30 Winter	100	+20%	100/15 Summer		
S3.001	S2	30 Winter	100	+20%	100/15 Summer		
S3.002	S3	30 Winter	100	+20%	30/30 Winter		
S3.003	S4	30 Winter	100	+20%	30/15 Winter		
S3.004	S5	30 Winter	100	+20%	30/15 Summer		
S4.000	S6	30 Winter	100	+20%	30/15 Winter		
S4.001	S7	30 Winter	100	+20%	30/15 Summer		
S4.002	S8	30 Winter	100	+20%	30/15 Summer		
S3.005	S9	30 Winter	100	+20%	30/15 Summer	100/5760 Winter	
S3.006	S10	30 Winter	100	+20%	30/15 Summer		
S5.000	S11	30 Winter	100	+20%	30/15 Winter		
S5.001	S12	30 Winter	100	+20%	30/15 Summer	100/5760 Winter	
S6.000	S13	30 Winter	100	+20%	30/30 Winter		
S7.000	SSwale Node 1	15 Summer	100	+20%			

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S3.000	S1		76.454	0.714	0.000	0.16			19.6
S3.001	S2		76.448	0.821	0.000	0.18			21.4
S3.002	S3		76.444	0.910	0.000	0.59			73.9
S3.003	S4		76.416	1.048	0.000	0.51			62.6
S3.004	S5		76.391	1.159	0.000	0.86			106.9
S4.000	S6		76.405	1.025	0.000	0.62			68.3
S4.001	S7		76.369	1.273	0.000	0.54			48.1
S4.002	S8		76.353	1.298	0.000	0.55			42.3
S3.005	S9		76.342	1.235	0.000	0.67			111.4
S3.006	S10		76.288	1.240	0.000	0.45			113.7
S5.000	S11		76.278	1.048	0.000	0.27			30.2
S5.001	S12		76.269	1.149	0.000	0.17			21.1
S6.000	S13		76.303	0.893	0.000	0.46			96.8
S7.000	SSwale Node 1		76.349	-0.081	0.000	0.37			63.0

PN	US/MH Name	Status	Level Exceeded
S3.000	S1	FLOOD RISK	
S3.001	S2	FLOOD RISK	
S3.002	S3	FLOOD RISK	
S3.003	S4	FLOOD RISK	
S3.004	S5	FLOOD RISK	
S4.000	S6	FLOOD RISK	
S4.001	S7	FLOOD RISK	
S4.002	S8	FLOOD RISK	
S3.005	S9	FLOOD RISK	
S3.006	S10	SURCHARGED	
S5.000	S11	FLOOD RISK	
S5.001	S12	FLOOD RISK	
S6.000	S13	FLOOD RISK	
S7.000	SSwale Node 1	FLOOD RISK*	

Level of service:
No flooding

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S7.001	SSwale Node 2	15 Summer	100	+20%			
S7.002	SSwale Node 3	30 Winter	100	+20%			
S7.003	SSwale Node 4	30 Winter	100	+20%			
S7.004	SSwale Node 5	30 Winter	100	+20%			
S7.005	SSwale Node 6	30 Winter	100	+20%			
S7.006	S14	30 Winter	100	+20%	100/30 Winter		
S6.001	S15	30 Winter	100	+20%	30/15 Summer		
S6.002	S16	30 Winter	100	+20%	30/15 Summer	100/1440 Winter	
S5.002	S17	30 Winter	100	+20%	30/15 Summer	100/1440 Winter	
S3.007	S18	30 Winter	100	+20%	30/15 Summer	100/5760 Winter	
S8.000	SSwale Node 7	15 Summer	100	+20%			
S8.001	SSwale Node 8	15 Summer	100	+20%			
S8.002	S19	15 Summer	100	+20%			
S3.008	SNode 1	15 Summer	100	+20%			
S3.009	S20	30 Winter	100	+20%	5/30 Winter		
S9.000	SSwale Node 9	15 Winter	100	+20%			
S9.001	S21	30 Winter	100	+20%			
S3.010	S22	30 Winter	100	+20%	5/15 Winter		
S10.000	S23	30 Winter	100	+20%	100/15 Winter		
S11.000	S24	30 Winter	100	+20%	100/30 Winter		
S11.001	S25	30 Winter	100	+20%	30/15 Winter		
S10.001	S26	30 Winter	100	+20%	30/15 Summer		
S3.011	S27	30 Winter	100	+20%	30/15 Summer		
S12.000	S28	30 Winter	100	+20%	100/30 Winter		
S12.001	S29	30 Winter	100	+20%	30/30 Winter		
S3.012	S30	30 Winter	100	+20%	30/15 Summer		
S3.013	S31	30 Winter	100	+20%	30/15 Summer		
S13.000	SSwale Node 10	15 Summer	100	+20%			
S13.001	SSwale Node 11	15 Summer	100	+20%			
S13.002	S32	15 Summer	100	+20%			
S3.014	SNode 2	15 Summer	100	+20%			
S3.015	S33	30 Winter	100	+20%	5/30 Winter		
S14.000	SSwale Node 12	15 Summer	100	+20%			
S14.001	S34	15 Summer	100	+20%			
S3.016	SNode 3	15 Summer	100	+20%	5/30 Winter		
S15.000	S35	15 Winter	100	+20%	5/15 Summer		
S15.001	S36	30 Winter	100	+20%	30/15 Summer		
S16.000	SSwale Node 13	15 Summer	100	+20%			
S16.001	SSwale Node 14	15 Winter	100	+20%			
S16.002	SSwale Node 15	15 Winter	100	+20%			
S16.003	SSwale Node 16	30 Winter	100	+20%			
S16.004	SSwale Node 17	30 Winter	100	+20%			