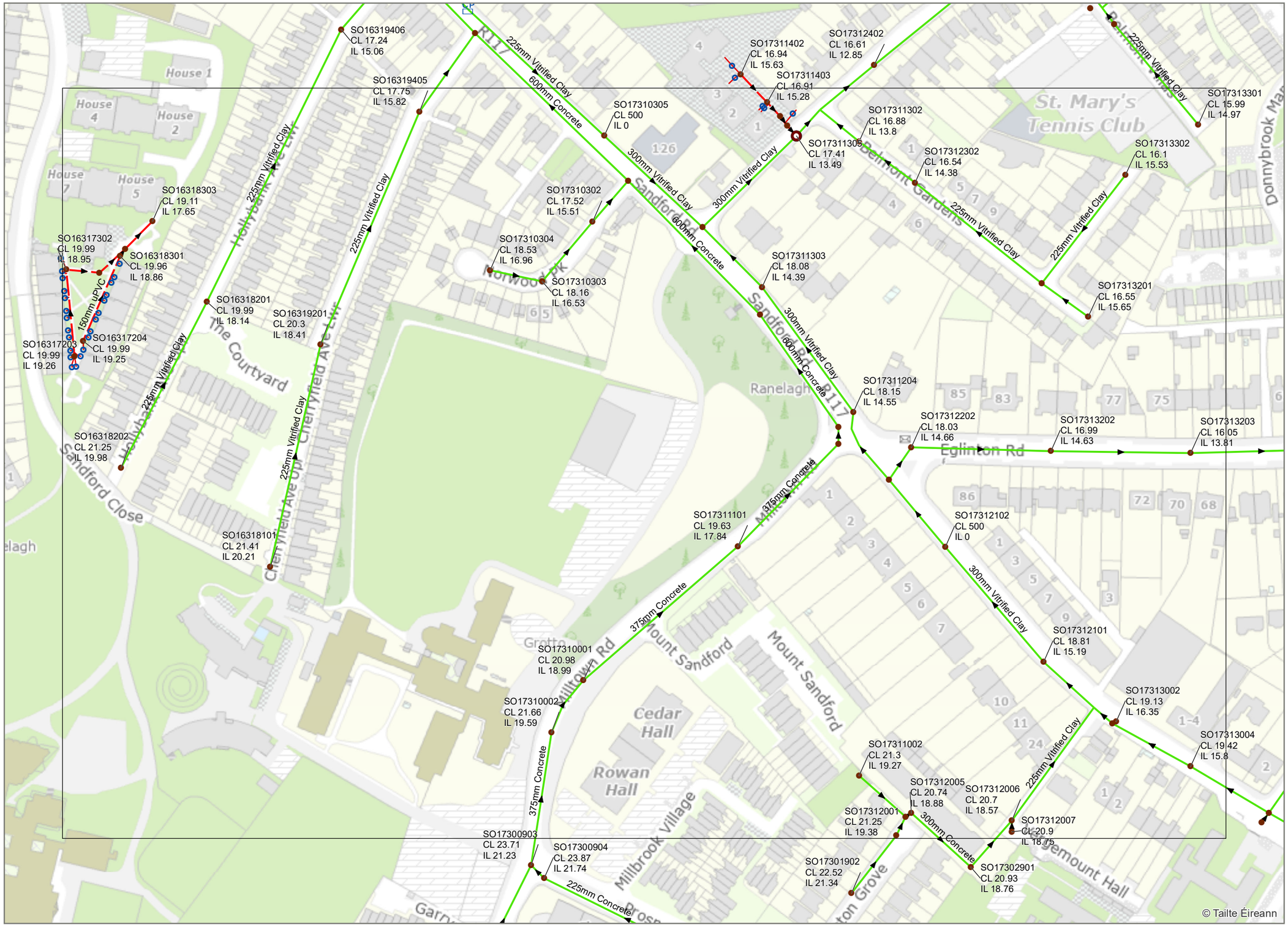
Appendix A : Uisce Eireann Network Plans



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2. Whilst every care has been taken in its compilation, Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions.This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

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Sewer Network
Sandford Road, Ranelagh, Co.Dublin

Uisce Éireann
Irish Water

Legend

- Location

Sewer Manholes
- Standard
- Backdrop

Sewer Inlets
- Catchpit
- Other; Unknown

Sewer Mains (Irish Water)
- Gravity - Combined
- Gravity - Foul

Sewer Lateral Lines
- Sewer Lateral Lines

0 15 30 60 m

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A3:	1:2,016
Drawing No.:	IW-AGG-2018-000
Drawn By:	Mo Ismail
Checked By:	<Add Name>
Approved By:	<Add Name>
Drawn Date	24/11/2025
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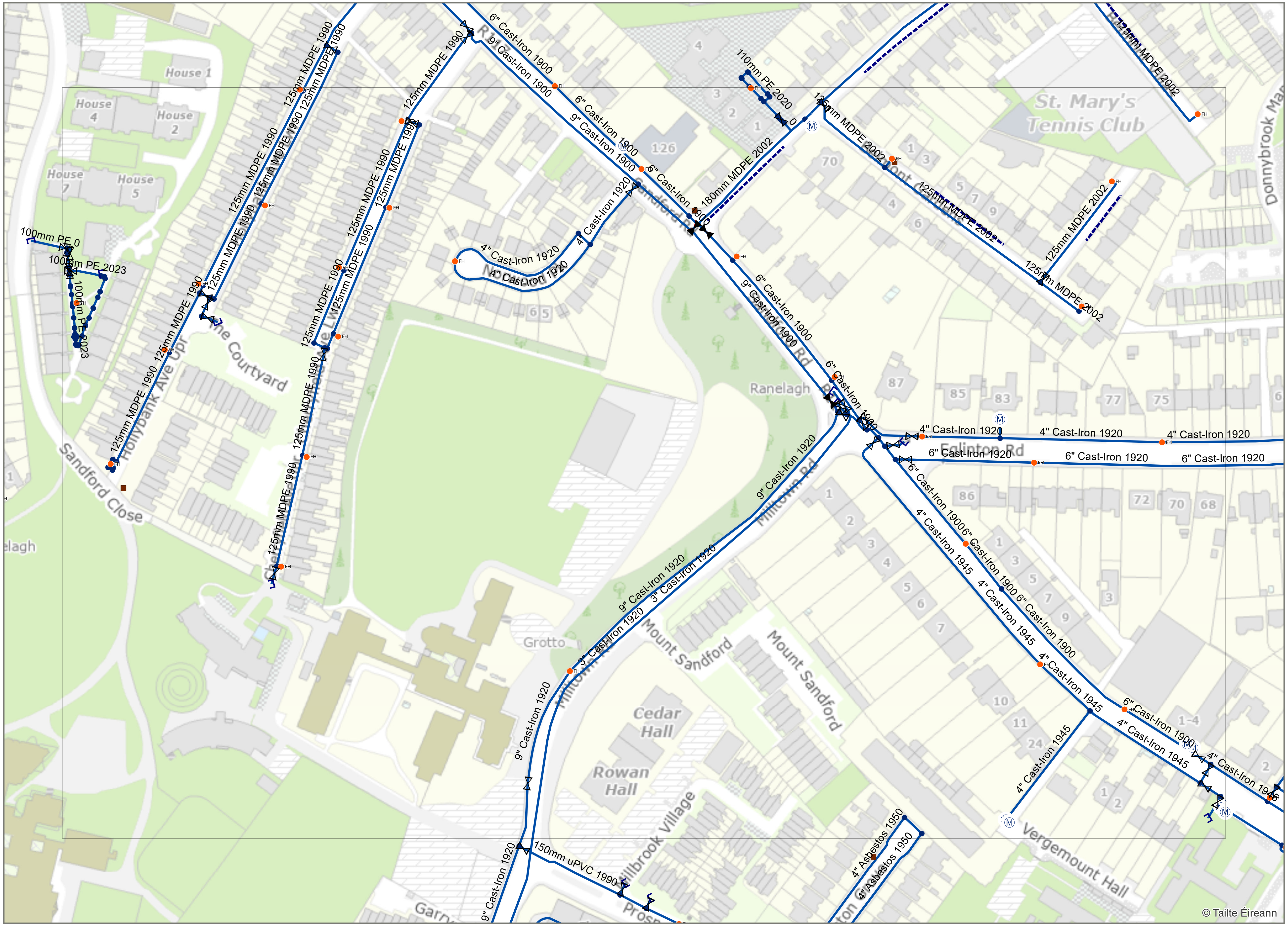
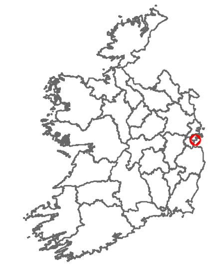
Approved Date:	<dd/mm/yyyy>



Uisce Éireann Irish Water



Legend

- Location
- Sluice Valve Open
- Sluice Valve Closed

Boundary Valves

- Closed

Non Boundary Valves

- Open

Air Control Valves

- Air Control Valves

Non Boundary Meter

- Meter

Water Hydrants

- Fire Hydrant

Water Fittings

- Cap
- Other Fitting

Pressure Monitoring Point

- Pressure Monitoring Point

Water Mains(Irish Water Owned)

- Potable Water

Water Abandoned Lines

- Water Abandoned Lines

0 15 30 60 m

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A3:	1:2,016
Drawing No.:	IW-AGG-2018-000
Drawn By:	Mo Ismail
Checked By:	<Add Name>
Approved By:	<Add Name>
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Water Distribution
Sandford Road, Ranelagh, Co.Dublin

Appendix B : Attenuation Calculations

STORMTECH Stormwater Management System Design Tool

ver: Jun14

PROJECT REF:	190226 - Attenuation Tank - Catchment 1
LOCATION:	Sandford
DATE:	10.12.2025
CREATED BY:	ED

Instructions:
- Fill in blue highlighted cells
- Set width to maximum allowance
- Adjust site parameters and system dimension until volume achieved
- For Rectangular systems only, for irregular shape dig contact Microstrain

SYSTEM PARAMETERS

Required Total Storage	**243.2**	m^3
Stormtech chamber model	**MC3500**	
Number of Isolator Rows for TSS Removal	1	

SITE PARAMETERS

Maximum Width at Excavation Base	20	m	
Stone Porosity	40%		
Excavation Batter Angle (degrees)	60	°	*Minimum Requirement*
Stone Below Chambers	0.35	m	*0.23*
Stone Above Chambers	0.3	m	*0.30*
Additional Storage. E.g manholes, pipe	0	m^3	

CALCULATED CHAMBER SYSTEM DIMENSIONS

	Calculated	Adopted	
Number of Rows	9		ea
Number of units per Row	4		ea
Number of MC3500 Chambers	36		ea
Number of MC3500 Endcaps	18		ea
System Installed Storage Depth (effective storage depth)	1.795		m
Tank overall installed Width at base	20.04	20.5	m
Tank overall installed Length at Base	10.46	11	m
Total Effective System Storage	**249.0**	**261.2**	m^3

STORMTECH SYSTEM DETAIL

StormTech Chamber Model	MC3500	
Unit Width	1.955	m
Unit Length	2.18	m
Unit Height	1.145	m
Min Cover Over System	0.3	m
Max Cover Over Chamber	2.4	m
Internal Storage Vol. (Chamber only)	3.11	m^3

STONE AND EXCAVATION DETAIL

Volume of Dig for System	467	
Area of Dig at Base of System	226	m^2
Area of Dig at Top of System	295	m^2
Void Ratio	56%	
Stone Requirement - tonne	566	tonne

StormTech
Detention • Retention • Recharge
Subsurface Stormwater Management™

Cascade Summary of Results for 3. Pond 1.SRCX

Upstream Structures	Outflow To	Overflow To
1. Block D1 (Blue roof).SRCX 2. Block D2 (Green Roof).SRCX	9. Att Tank - Catchment 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	20.215	0.181	0.1	7.8	O K
30 min Summer	20.282	0.248	0.1	11.5	O K
60 min Summer	20.346	0.312	0.1	15.5	O K
120 min Summer	20.413	0.379	0.1	20.2	O K
180 min Summer	20.454	0.420	0.1	23.3	O K
240 min Summer	20.484	0.450	0.1	25.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	7.1	712
30 min Summer	60.337	0.0	8.3	821
60 min Summer	39.120	0.0	17.8	944
120 min Summer	24.669	0.0	20.0	1098
180 min Summer	18.673	0.0	21.0	1204
240 min Summer	15.302	0.0	21.7	1286

Cascade Summary of Results for 3. Pond 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	20.527	0.493	0.1	29.4	O K
480 min Summer	20.558	0.524	0.2	32.3	O K
600 min Summer	20.583	0.549	0.2	34.6	O K
720 min Summer	20.603	0.569	0.2	36.6	O K
960 min Summer	20.636	0.602	0.2	39.9	O K
1440 min Summer	20.682	0.648	0.2	44.9	Flood Risk
2160 min Summer	20.727	0.693	0.2	50.0	Flood Risk
2880 min Summer	20.755	0.721	0.2	53.3	Flood Risk
4320 min Summer	20.779	0.745	0.2	56.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	22.5	1414
480 min Summer	9.408	0.0	22.9	1530
600 min Summer	8.035	0.0	23.1	1640
720 min Summer	7.061	0.0	23.2	1736
960 min Summer	5.757	0.0	23.2	1916
1440 min Summer	4.315	0.0	22.5	2252
2160 min Summer	3.233	0.0	48.2	2716
2880 min Summer	2.632	0.0	47.7	3192
4320 min Summer	1.966	0.0	44.8	4276

Cascade Summary of Results for 3. Pond 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	20.780	0.746	0.2	56.5	Flood Risk
7200 min Summer	20.778	0.744	0.2	56.2	Flood Risk
8640 min Summer	20.774	0.740	0.2	55.7	Flood Risk
10080 min Summer	20.769	0.735	0.2	55.0	Flood Risk
15 min Winter	20.215	0.181	0.1	7.8	O K
30 min Winter	20.282	0.248	0.1	11.5	O K
60 min Winter	20.346	0.312	0.1	15.5	O K
120 min Winter	20.413	0.379	0.1	20.2	O K
180 min Winter	20.454	0.420	0.1	23.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	89.6	4984
7200 min Summer	1.360	0.0	89.5	5712
8640 min Summer	1.192	0.0	87.6	6480
10080 min Summer	1.066	0.0	84.4	7216
15 min Winter	87.356	0.0	7.1	712
30 min Winter	60.337	0.0	8.3	821
60 min Winter	39.120	0.0	17.8	944
120 min Winter	24.669	0.0	20.0	1096
180 min Winter	18.673	0.0	21.0	1204

Cascade Summary of Results for 3. Pond 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	20.484	0.450	0.1	25.7	O K
360 min Winter	20.527	0.493	0.1	29.4	O K
480 min Winter	20.558	0.524	0.2	32.3	O K
600 min Winter	20.583	0.549	0.2	34.6	O K
720 min Winter	20.603	0.569	0.2	36.6	O K
960 min Winter	20.636	0.602	0.2	39.9	O K
1440 min Winter	20.682	0.648	0.2	44.9	Flood Risk
2160 min Winter	20.727	0.693	0.2	50.0	Flood Risk
2880 min Winter	20.755	0.721	0.2	53.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	21.7	1284
360 min Winter	11.522	0.0	22.5	1412
480 min Winter	9.408	0.0	22.9	1528
600 min Winter	8.035	0.0	23.2	1638
720 min Winter	7.061	0.0	23.2	1732
960 min Winter	5.757	0.0	23.2	1910
1440 min Winter	4.315	0.0	22.5	2246
2160 min Winter	3.233	0.0	48.3	2708
2880 min Winter	2.632	0.0	47.8	3184

Cascade Summary of Results for 3. Pond 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	20.780	0.746	0.2	56.4	Flood Risk
5760 min Winter	20.778	0.744	0.2	56.2	Flood Risk
7200 min Winter	20.772	0.738	0.2	55.5	Flood Risk
8640 min Winter	20.764	0.730	0.2	54.4	Flood Risk
10080 min Winter	20.752	0.718	0.2	53.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	45.0	4236
5760 min Winter	1.598	0.0	89.7	5104
7200 min Winter	1.360	0.0	89.7	5832
8640 min Winter	1.192	0.0	88.0	6656
10080 min Winter	1.066	0.0	84.9	7488

Cascade Rainfall Details for 3. Pond 1.SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.016

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.009	4	8	0.007

Cascade Model Details for 3. Pond 1.SRCX

Storage is Online Cover Level (m) 20.960

Tank or Pond Structure

Invert Level (m) 20.034

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	35.0	0.816	137.0	0.817	137.0

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 20.034

Cascade Summary of Results for 9. Att Tank - Catchment 1.SRCX

Upstream Structures	Outflow To	Overflow To
3. Pond 1.SRCX	20. Att Tank - Catchment 4.SRCX	(None)
1. Block D1 (Blue roof).SRCX		
2. Block D2 (Green Roof).SRCX		
4. Podium B (Blue).SRCX		
5. Block B1 (Green).SRCX		
6. Block B2 (Green).SRCX		
7. Block F1 (Blue).SRCX		
8. Block F2 (Green).SRCX		

Half Drain Time : 340 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	19.054	0.689	0.0	6.0	6.0	93.2	O K
30 min Summer	19.312	0.947	0.0	6.0	6.0	128.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	159.9	22
30 min Summer	60.337	0.0	219.6	37

Cascade Summary of Results for 9. Att Tank - Catchment 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
60 min Summer	19.567	1.202	0.0	6.0	6.0	162.6	O K
120 min Summer	19.814	1.449	0.0	6.0	6.0	196.0	O K
180 min Summer	19.943	1.578	0.0	6.0	6.0	213.5	O K
240 min Summer	20.023	1.658	0.0	6.2	6.2	224.3	O K
360 min Summer	20.107	1.742	0.0	6.3	6.3	235.6	O K
480 min Summer	20.138	1.773	0.0	6.4	6.4	239.9	O K
600 min Summer	20.145	1.780	0.0	6.4	6.4	240.9	O K
720 min Summer	20.147	1.782	0.0	6.4	6.4	241.2	O K
960 min Summer	20.144	1.779	0.0	6.4	6.4	240.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Summer	39.120	0.0	313.3	66
120 min Summer	24.669	0.0	392.2	126
180 min Summer	18.673	0.0	443.2	184
240 min Summer	15.302	0.0	482.3	244
360 min Summer	11.522	0.0	541.2	362
480 min Summer	9.408	0.0	585.9	480
600 min Summer	8.035	0.0	622.2	562
720 min Summer	7.061	0.0	652.8	618
960 min Summer	5.757	0.0	702.3	752

Cascade Summary of Results for 9. Att Tank - Catchment 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
1440 min Summer	20.121	1.756	0.0	6.3	6.3	237.6	O K
2160 min Summer	20.058	1.693	0.0	6.2	6.2	229.1	O K
2880 min Summer	19.976	1.611	0.0	6.1	6.1	218.0	O K
4320 min Summer	19.793	1.428	0.0	6.0	6.0	193.2	O K
5760 min Summer	19.601	1.236	0.0	6.0	6.0	167.2	O K
7200 min Summer	19.361	0.996	0.0	6.0	6.0	134.8	O K
8640 min Summer	19.021	0.656	0.0	6.0	6.0	88.7	O K
10080 min Summer	18.854	0.489	0.0	6.0	6.0	66.1	O K
15 min Winter	19.054	0.689	0.0	6.0	6.0	93.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
1440 min Summer	4.315	0.0	771.8	1024
2160 min Summer	3.233	0.0	943.8	1448
2880 min Summer	2.632	0.0	1017.1	1872
4320 min Summer	1.966	0.0	1119.7	2720
5760 min Summer	1.598	0.0	1275.1	3528
7200 min Summer	1.360	0.0	1350.6	4400
8640 min Summer	1.192	0.0	1413.9	4920
10080 min Summer	1.066	0.0	1465.4	5544
15 min Winter	87.356	0.0	159.9	22

Cascade Summary of Results for 9. Att Tank - Catchment 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	19.312	0.947	0.0	6.0	6.0	128.1	O K
60 min Winter	19.567	1.202	0.0	6.0	6.0	162.7	O K
120 min Winter	19.818	1.453	0.0	6.0	6.0	196.5	O K
180 min Winter	19.950	1.585	0.0	6.0	6.0	214.4	O K
240 min Winter	20.033	1.668	0.0	6.2	6.2	225.6	O K
360 min Winter	20.121	1.756	0.0	6.3	6.3	237.6	O K
480 min Winter	20.158	1.793	0.0	6.4	6.4	242.5	O K
600 min Winter	20.501	2.136	0.0	6.9	6.9	243.2	O K
720 min Winter	20.239	1.874	0.0	6.5	6.5	243.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	60.337	0.0	219.6	36
60 min Winter	39.120	0.0	313.3	66
120 min Winter	24.669	0.0	392.2	122
180 min Winter	18.673	0.0	443.2	180
240 min Winter	15.302	0.0	482.3	238
360 min Winter	11.522	0.0	541.2	352
480 min Winter	9.408	0.0	586.0	464
600 min Winter	8.035	0.0	622.3	560
720 min Winter	7.061	0.0	652.9	668

Cascade Summary of Results for 9. Att Tank - Catchment 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	20.140	1.775	0.0	6.4	6.4	240.1	O K
1440 min Winter	20.085	1.720	0.0	6.3	6.3	232.7	O K
2160 min Winter	19.961	1.596	0.0	6.0	6.0	215.9	O K
2880 min Winter	19.816	1.451	0.0	6.0	6.0	196.3	O K
4320 min Winter	19.479	1.114	0.0	6.0	6.0	150.8	O K
5760 min Winter	18.950	0.585	0.0	6.0	6.0	79.2	O K
7200 min Winter	18.719	0.354	0.0	5.9	5.9	47.9	O K
8640 min Winter	18.608	0.243	0.0	5.6	5.6	32.9	O K
10080 min Winter	18.548	0.183	0.0	5.2	5.2	24.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	5.757	0.0	702.5	770
1440 min Winter	4.315	0.0	772.2	1084
2160 min Winter	3.233	0.0	943.9	1556
2880 min Winter	2.632	0.0	1017.3	2020
4320 min Winter	1.966	0.0	1120.1	2964
5760 min Winter	1.598	0.0	1275.2	3520
7200 min Winter	1.360	0.0	1350.9	4104
8640 min Winter	1.192	0.0	1414.3	4752
10080 min Winter	1.066	0.0	1466.3	5440

Cascade Rainfall Details for 9. Att Tank - Catchment 1.SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.447

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.224	4	8	0.223

Cascade Model Details for 9. Att Tank - Catchment 1.SRCX

Storage is Online Cover Level (m) 21.081

Cellular Storage Structure

Invert Level (m) 18.365 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.60
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	225.5	225.5	1.795	225.5	225.5	1.796	0.0	225.5

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0107-6400-1795-6400	Sump Available	Yes
Design Head (m)	1.795	Diameter (mm)	107
Design Flow (l/s)	6.4	Invert Level (m)	18.365
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.795	6.4	Kick-Flo®	0.953	4.8
Flush-Flo™	0.467	6.0	Mean Flow over Head Range	-	5.4

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

Hydro-Brake® Optimum Outflow Control

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	0.600	5.9	1.600	6.1	2.600	7.6	5.000	10.4	7.500	12.6
0.200	5.3	0.800	5.5	1.800	6.4	3.000	8.1	5.500	10.8	8.000	13.0
0.300	5.8	1.000	4.9	2.000	6.7	3.500	8.7	6.000	11.3	8.500	13.3
0.400	6.0	1.200	5.3	2.200	7.0	4.000	9.3	6.500	11.7	9.000	13.7
0.500	6.0	1.400	5.7	2.400	7.3	4.500	9.9	7.000	12.2	9.500	14.1

Cascade Summary of Results for 4. Podium B (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	9. Att Tank - Catchment 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.964	0.021	0.8	47.5	O K
30 min Summer	18.972	0.029	1.0	65.1	O K
60 min Summer	18.981	0.038	1.2	83.4	O K
120 min Summer	18.990	0.047	1.4	102.8	O K
180 min Summer	18.995	0.052	1.4	114.2	O K
240 min Summer	18.998	0.055	1.5	122.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	37.7	23
30 min Summer	60.337	0.0	51.7	37
60 min Summer	39.120	0.0	81.7	66
120 min Summer	24.669	0.0	102.5	126
180 min Summer	18.673	0.0	115.8	184
240 min Summer	15.302	0.0	125.9	244

Cascade Summary of Results for 4. Podium B (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	19.003	0.060	1.5	132.4	O K
480 min Summer	19.006	0.063	1.6	138.5	O K
600 min Summer	19.007	0.064	1.6	142.1	O K
720 min Summer	19.008	0.065	1.6	144.6	O K
960 min Summer	19.010	0.067	1.6	148.3	O K
1440 min Summer	19.012	0.069	1.7	152.3	O K
2160 min Summer	19.012	0.069	1.7	153.3	O K
2880 min Summer	19.012	0.069	1.7	151.3	O K
4320 min Summer	19.008	0.065	1.6	143.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	140.8	362
480 min Summer	9.408	0.0	151.9	482
600 min Summer	8.035	0.0	160.5	596
720 min Summer	7.061	0.0	167.6	644
960 min Summer	5.757	0.0	178.0	764
1440 min Summer	4.315	0.0	189.1	1024
2160 min Summer	3.233	0.0	252.9	1436
2880 min Summer	2.632	0.0	272.5	1848
4320 min Summer	1.966	0.0	296.1	2680

Cascade Summary of Results for 4. Podium B (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	19.004	0.061	1.6	135.1	O K
7200 min Summer	19.000	0.057	1.5	126.5	O K
8640 min Summer	18.997	0.054	1.5	118.6	O K
10080 min Summer	18.993	0.050	1.4	111.3	O K
15 min Winter	18.964	0.021	0.8	47.5	O K
30 min Winter	18.973	0.030	1.1	65.2	O K
60 min Winter	18.981	0.038	1.2	83.5	O K
120 min Winter	18.990	0.047	1.4	102.9	O K
180 min Winter	18.995	0.052	1.4	114.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	336.4	3464
7200 min Summer	1.360	0.0	357.9	4248
8640 min Summer	1.192	0.0	376.5	5016
10080 min Summer	1.066	0.0	390.6	5752
15 min Winter	87.356	0.0	37.7	22
30 min Winter	60.337	0.0	51.7	37
60 min Winter	39.120	0.0	81.8	66
120 min Winter	24.669	0.0	102.5	124
180 min Winter	18.673	0.0	115.8	182

Cascade Summary of Results for 4. Podium B (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	18.998	0.055	1.5	122.4	O K
360 min Winter	19.003	0.060	1.5	132.8	O K
480 min Winter	19.006	0.063	1.6	139.1	O K
600 min Winter	19.008	0.065	1.6	143.0	O K
720 min Winter	19.009	0.066	1.6	145.4	O K
960 min Winter	19.010	0.067	1.6	148.0	O K
1440 min Winter	19.011	0.068	1.7	150.7	O K
2160 min Winter	19.010	0.067	1.6	148.9	O K
2880 min Winter	19.008	0.065	1.6	144.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	125.9	240
360 min Winter	11.522	0.0	140.9	354
480 min Winter	9.408	0.0	151.9	466
600 min Winter	8.035	0.0	160.6	576
720 min Winter	7.061	0.0	167.6	682
960 min Winter	5.757	0.0	178.1	780
1440 min Winter	4.315	0.0	189.3	1084
2160 min Winter	3.233	0.0	252.9	1540
2880 min Winter	2.632	0.0	272.5	1988

Cascade Summary of Results for 4. Podium B (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	19.003	0.060	1.5	131.5	O K
5760 min Winter	18.997	0.054	1.5	118.8	O K
7200 min Winter	18.992	0.049	1.4	107.4	O K
8640 min Winter	18.987	0.044	1.3	97.4	O K
10080 min Winter	18.983	0.040	1.2	88.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	296.3	2852
5760 min Winter	1.598	0.0	336.4	3640
7200 min Winter	1.360	0.0	357.9	4464
8640 min Winter	1.192	0.0	376.5	5192
10080 min Winter	1.066	0.0	390.9	5952

Cascade Rainfall Details for 4. Podium B (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.220

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.110	4	8	0.110

Cascade Model Details for 4. Podium B (Blue).SRCX

Storage is Online Cover Level (m) 21.000

Tank or Pond Structure

Invert Level (m) 18.943

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2208.0	0.097	2208.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 18.943

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.8700	0.034	1.1300	0.049	1.3900	0.069	1.6700	0.081	1.8200
0.029	1.0400	0.041	1.2600	0.059	1.5300	0.074	1.7400		

Cascade Summary of Results for 5. Block B1 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	9. Att Tank - Catchment 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.908	0.021	0.1	3.2	O K
30 min Summer	18.916	0.029	0.1	4.4	O K
60 min Summer	18.924	0.037	0.1	5.6	O K
120 min Summer	18.932	0.045	0.1	6.8	O K
180 min Summer	18.936	0.049	0.2	7.4	O K
240 min Summer	18.939	0.052	0.2	7.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	3.0	23
30 min Summer	60.337	0.0	4.2	37
60 min Summer	39.120	0.0	5.8	66
120 min Summer	24.669	0.0	7.3	126
180 min Summer	18.673	0.0	8.3	186
240 min Summer	15.302	0.0	9.1	244

Cascade Summary of Results for 5. Block B1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	18.941	0.054	0.2	8.3	O K
480 min Summer	18.943	0.056	0.2	8.5	O K
600 min Summer	18.944	0.057	0.2	8.7	O K
720 min Summer	18.945	0.058	0.2	8.8	O K
960 min Summer	18.945	0.058	0.2	8.9	O K
1440 min Summer	18.945	0.058	0.2	8.9	O K
2160 min Summer	18.943	0.056	0.2	8.6	O K
2880 min Summer	18.941	0.054	0.2	8.2	O K
4320 min Summer	18.935	0.048	0.2	7.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	10.3	350
480 min Summer	9.408	0.0	11.1	404
600 min Summer	8.035	0.0	11.9	466
720 min Summer	7.061	0.0	12.5	528
960 min Summer	5.757	0.0	13.5	666
1440 min Summer	4.315	0.0	15.0	942
2160 min Summer	3.233	0.0	17.4	1348
2880 min Summer	2.632	0.0	18.9	1760
4320 min Summer	1.966	0.0	21.1	2552

Cascade Summary of Results for 5. Block B1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	18.930	0.043	0.1	6.5	O K
7200 min Summer	18.925	0.038	0.1	5.8	O K
8640 min Summer	18.922	0.035	0.1	5.3	O K
10080 min Summer	18.919	0.032	0.1	4.8	O K
15 min Winter	18.908	0.021	0.1	3.2	O K
30 min Winter	18.916	0.029	0.1	4.4	O K
60 min Winter	18.924	0.037	0.1	5.6	O K
120 min Winter	18.932	0.045	0.1	6.8	O K
180 min Winter	18.936	0.049	0.2	7.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	22.9	3288
7200 min Summer	1.360	0.0	24.4	4032
8640 min Summer	1.192	0.0	25.7	4752
10080 min Summer	1.066	0.0	26.8	5448
15 min Winter	87.356	0.0	3.0	23
30 min Winter	60.337	0.0	4.2	37
60 min Winter	39.120	0.0	5.8	66
120 min Winter	24.669	0.0	7.3	124
180 min Winter	18.673	0.0	8.3	182

Cascade Summary of Results for 5. Block B1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	18.939	0.052	0.2	7.9	O K
360 min Winter	18.942	0.055	0.2	8.3	O K
480 min Winter	18.943	0.056	0.2	8.5	O K
600 min Winter	18.944	0.057	0.2	8.6	O K
720 min Winter	18.944	0.057	0.2	8.7	O K
960 min Winter	18.944	0.057	0.2	8.7	O K
1440 min Winter	18.943	0.056	0.2	8.5	O K
2160 min Winter	18.939	0.052	0.2	8.0	O K
2880 min Winter	18.935	0.048	0.2	7.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	9.1	238
360 min Winter	11.522	0.0	10.3	348
480 min Winter	9.408	0.0	11.1	446
600 min Winter	8.035	0.0	11.9	478
720 min Winter	7.061	0.0	12.5	554
960 min Winter	5.757	0.0	13.5	708
1440 min Winter	4.315	0.0	15.0	1012
2160 min Winter	3.233	0.0	17.4	1452
2880 min Winter	2.632	0.0	18.9	1876

Cascade Summary of Results for 5. Block B1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	18.927	0.040	0.1	6.1	O K
5760 min Winter	18.921	0.034	0.1	5.1	O K
7200 min Winter	18.916	0.029	0.1	4.4	O K
8640 min Winter	18.913	0.026	0.1	3.9	O K
10080 min Winter	18.910	0.023	0.1	3.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	21.1	2644
5760 min Winter	1.598	0.0	22.9	3400
7200 min Winter	1.360	0.0	24.4	4112
8640 min Winter	1.192	0.0	25.7	4840
10080 min Winter	1.066	0.0	26.8	5544

Cascade Rainfall Details for 5. Block B1 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.015

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.015

Cascade Model Details for 5. Block B1 (Green).SRCX

Storage is Online Cover Level (m) 20.900

Tank or Pond Structure

Invert Level (m) 18.887

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	152.0	0.114	152.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 18.887

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1300	0.048	0.1500	0.065	0.1800	0.070	0.1800
0.029	0.1200	0.040	0.1400	0.057	0.1700	0.068	0.1800		

Cascade Summary of Results for 6. Block B2 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	9. Att Tank - Catchment 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.769	0.021	0.1	2.8	O K
30 min Summer	18.777	0.029	0.1	3.8	O K
60 min Summer	18.785	0.037	0.1	4.8	O K
120 min Summer	18.792	0.044	0.1	5.8	O K
180 min Summer	18.796	0.048	0.2	6.3	O K
240 min Summer	18.799	0.051	0.2	6.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	2.7	23
30 min Summer	60.337	0.0	3.7	37
60 min Summer	39.120	0.0	5.0	66
120 min Summer	24.669	0.0	6.3	126
180 min Summer	18.673	0.0	7.2	186
240 min Summer	15.302	0.0	7.9	244

Cascade Summary of Results for 6. Block B2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	18.801	0.053	0.2	6.9	O K
480 min Summer	18.802	0.054	0.2	7.1	O K
600 min Summer	18.803	0.055	0.2	7.2	O K
720 min Summer	18.804	0.056	0.2	7.3	O K
960 min Summer	18.804	0.056	0.2	7.4	O K
1440 min Summer	18.804	0.056	0.2	7.3	O K
2160 min Summer	18.801	0.053	0.2	6.9	O K
2880 min Summer	18.798	0.050	0.2	6.5	O K
4320 min Summer	18.792	0.044	0.1	5.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	8.9	318
480 min Summer	9.408	0.0	9.7	380
600 min Summer	8.035	0.0	10.4	442
720 min Summer	7.061	0.0	10.9	510
960 min Summer	5.757	0.0	11.8	648
1440 min Summer	4.315	0.0	13.2	926
2160 min Summer	3.233	0.0	15.1	1328
2880 min Summer	2.632	0.0	16.4	1732
4320 min Summer	1.966	0.0	18.3	2508

Cascade Summary of Results for 6. Block B2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	18.787	0.039	0.1	5.1	O K
7200 min Summer	18.783	0.035	0.1	4.6	O K
8640 min Summer	18.779	0.031	0.1	4.0	O K
10080 min Summer	18.776	0.028	0.1	3.6	O K
15 min Winter	18.769	0.021	0.1	2.8	O K
30 min Winter	18.777	0.029	0.1	3.8	O K
60 min Winter	18.785	0.037	0.1	4.8	O K
120 min Winter	18.792	0.044	0.1	5.8	O K
180 min Winter	18.796	0.048	0.2	6.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	19.9	3232
7200 min Summer	1.360	0.0	21.1	4032
8640 min Summer	1.192	0.0	22.2	4672
10080 min Summer	1.066	0.0	23.2	5352
15 min Winter	87.356	0.0	2.7	22
30 min Winter	60.337	0.0	3.7	37
60 min Winter	39.120	0.0	5.0	66
120 min Winter	24.669	0.0	6.3	124
180 min Winter	18.673	0.0	7.2	180

Cascade Summary of Results for 6. Block B2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	18.799	0.051	0.2	6.7	O K
360 min Winter	18.801	0.053	0.2	7.0	O K
480 min Winter	18.802	0.054	0.2	7.1	O K
600 min Winter	18.803	0.055	0.2	7.2	O K
720 min Winter	18.803	0.055	0.2	7.2	O K
960 min Winter	18.803	0.055	0.2	7.2	O K
1440 min Winter	18.801	0.053	0.2	6.9	O K
2160 min Winter	18.796	0.048	0.2	6.3	O K
2880 min Winter	18.792	0.044	0.1	5.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	7.9	236
360 min Winter	11.522	0.0	8.9	342
480 min Winter	9.408	0.0	9.7	388
600 min Winter	8.035	0.0	10.4	464
720 min Winter	7.061	0.0	10.9	540
960 min Winter	5.757	0.0	11.8	696
1440 min Winter	4.315	0.0	13.2	988
2160 min Winter	3.233	0.0	15.1	1428
2880 min Winter	2.632	0.0	16.4	1820

Cascade Summary of Results for 6. Block B2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	18.784	0.036	0.1	4.7	O K
5760 min Winter	18.777	0.029	0.1	3.8	O K
7200 min Winter	18.773	0.025	0.1	3.3	O K
8640 min Winter	18.770	0.022	0.1	2.9	O K
10080 min Winter	18.768	0.020	0.1	2.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	18.3	2600
5760 min Winter	1.598	0.0	19.9	3296
7200 min Winter	1.360	0.0	21.1	4032
8640 min Winter	1.192	0.0	22.2	4672
10080 min Winter	1.066	0.0	23.2	5384

Cascade Rainfall Details for 6. Block B2 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.013

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.013

Cascade Model Details for 6. Block B2 (Green).SRCX

Storage is Online Cover Level (m) 20.900

Tank or Pond Structure

Invert Level (m) 18.748

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	131.0	0.114	131.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 18.748

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.048	0.1500	0.063	0.1800
0.029	0.1200	0.040	0.1400	0.056	0.1700	0.066	0.1800

Cascade Summary of Results for 1. Block D1 (Blue roof).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	3. Pond 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	20.521	0.030	0.2	7.3	O K
30 min Summer	20.532	0.041	0.3	10.0	O K
60 min Summer	20.543	0.052	0.3	12.7	O K
120 min Summer	20.555	0.064	0.3	15.4	O K
180 min Summer	20.561	0.070	0.4	16.8	O K
240 min Summer	20.564	0.073	0.4	17.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	6.9	23
30 min Summer	60.337	0.0	9.5	37
60 min Summer	39.120	0.0	13.2	68
120 min Summer	24.669	0.0	16.7	126
180 min Summer	18.673	0.0	18.9	186
240 min Summer	15.302	0.0	20.6	244

Cascade Summary of Results for 1. Block D1 (Blue roof).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	20.568	0.077	0.4	18.7	O K
480 min Summer	20.571	0.080	0.4	19.3	O K
600 min Summer	20.572	0.081	0.4	19.6	O K
720 min Summer	20.573	0.082	0.4	19.9	O K
960 min Summer	20.574	0.083	0.4	20.2	O K
1440 min Summer	20.574	0.083	0.4	20.1	O K
2160 min Summer	20.571	0.080	0.4	19.4	O K
2880 min Summer	20.567	0.076	0.4	18.5	O K
4320 min Summer	20.559	0.068	0.3	16.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	23.3	350
480 min Summer	9.408	0.0	25.3	406
600 min Summer	8.035	0.0	27.0	468
720 min Summer	7.061	0.0	28.4	532
960 min Summer	5.757	0.0	30.7	668
1440 min Summer	4.315	0.0	34.0	942
2160 min Summer	3.233	0.0	39.5	1348
2880 min Summer	2.632	0.0	42.8	1760
4320 min Summer	1.966	0.0	47.9	2552

Cascade Summary of Results for 1. Block D1 (Blue roof).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	20.552	0.061	0.3	14.9	O K
7200 min Summer	20.547	0.056	0.3	13.5	O K
8640 min Summer	20.542	0.051	0.3	12.3	O K
10080 min Summer	20.537	0.046	0.3	11.2	O K
15 min Winter	20.521	0.030	0.2	7.3	O K
30 min Winter	20.532	0.041	0.3	10.0	O K
60 min Winter	20.543	0.052	0.3	12.7	O K
120 min Winter	20.555	0.064	0.3	15.4	O K
180 min Winter	20.561	0.070	0.4	16.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	52.0	3288
7200 min Summer	1.360	0.0	55.4	4040
8640 min Summer	1.192	0.0	58.2	4760
10080 min Summer	1.066	0.0	60.8	5544
15 min Winter	87.356	0.0	6.9	23
30 min Winter	60.337	0.0	9.5	37
60 min Winter	39.120	0.0	13.2	66
120 min Winter	24.669	0.0	16.7	124
180 min Winter	18.673	0.0	18.9	182

Cascade Summary of Results for 1. Block D1 (Blue roof).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	20.565	0.074	0.4	17.8	O K
360 min Winter	20.569	0.078	0.4	18.8	O K
480 min Winter	20.571	0.080	0.4	19.3	O K
600 min Winter	20.572	0.081	0.4	19.6	O K
720 min Winter	20.573	0.082	0.4	19.8	O K
960 min Winter	20.573	0.082	0.4	19.8	O K
1440 min Winter	20.571	0.080	0.4	19.3	O K
2160 min Winter	20.565	0.074	0.4	18.0	O K
2880 min Winter	20.560	0.069	0.3	16.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	20.6	238
360 min Winter	11.522	0.0	23.3	348
480 min Winter	9.408	0.0	25.3	448
600 min Winter	8.035	0.0	27.0	480
720 min Winter	7.061	0.0	28.4	556
960 min Winter	5.757	0.0	30.7	714
1440 min Winter	4.315	0.0	34.0	1014
2160 min Winter	3.233	0.0	39.5	1452
2880 min Winter	2.632	0.0	42.8	1852

Cascade Summary of Results for 1. Block D1 (Blue roof).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	20.549	0.058	0.3	14.0	O K
5760 min Winter	20.540	0.049	0.3	12.0	O K
7200 min Winter	20.534	0.043	0.3	10.3	O K
8640 min Winter	20.528	0.037	0.2	8.9	O K
10080 min Winter	20.524	0.033	0.2	7.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	47.9	2644
5760 min Winter	1.598	0.0	52.0	3408
7200 min Winter	1.360	0.0	55.4	4176
8640 min Winter	1.192	0.0	58.2	4920
10080 min Winter	1.066	0.0	60.8	5552

Cascade Rainfall Details for 1. Block D1 (Blue roof).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.034

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.000	4	8	0.034

Cascade Model Details for 1. Block D1 (Blue roof).SRCX

Storage is Online Cover Level (m) 21.411

Tank or Pond Structure

Invert Level (m) 20.491

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	242.0	0.097	242.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 20.491

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.028	0.2100	0.045	0.2700	0.065	0.3400	0.088	0.3900	0.094	0.4100
0.039	0.2500	0.054	0.3000	0.077	0.3700	0.093	0.4000		

Cascade Summary of Results for 2. Block D2 (Green Roof).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	3. Pond 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	20.493	0.022	0.1	3.0	O K
30 min Summer	20.502	0.031	0.1	4.1	O K
60 min Summer	20.510	0.039	0.1	5.2	O K
120 min Summer	20.518	0.047	0.1	6.3	O K
180 min Summer	20.522	0.051	0.2	6.9	O K
240 min Summer	20.525	0.054	0.2	7.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	2.9	23
30 min Summer	60.337	0.0	4.0	37
60 min Summer	39.120	0.0	5.4	66
120 min Summer	24.669	0.0	6.8	126
180 min Summer	18.673	0.0	7.8	186
240 min Summer	15.302	0.0	8.5	244

Cascade Summary of Results for 2. Block D2 (Green Roof).SRCX

	Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360	min Summer	20.527	0.056	0.2	7.5	O K
480	min Summer	20.529	0.058	0.2	7.7	O K
600	min Summer	20.530	0.059	0.2	7.9	O K
720	min Summer	20.530	0.059	0.2	8.0	O K
960	min Summer	20.531	0.060	0.2	8.0	O K
1440	min Summer	20.530	0.059	0.2	8.0	O K
2160	min Summer	20.528	0.057	0.2	7.6	O K
2880	min Summer	20.525	0.054	0.2	7.2	O K
4320	min Summer	20.518	0.047	0.1	6.4	O K

	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360	min Summer	11.522	0.0	9.6	326
480	min Summer	9.408	0.0	10.5	386
600	min Summer	8.035	0.0	11.2	450
720	min Summer	7.061	0.0	11.7	516
960	min Summer	5.757	0.0	12.7	656
1440	min Summer	4.315	0.0	14.2	928
2160	min Summer	3.233	0.0	16.2	1344
2880	min Summer	2.632	0.0	17.6	1736
4320	min Summer	1.966	0.0	19.8	2512

Cascade Summary of Results for 2. Block D2 (Green Roof).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	20.513	0.042	0.1	5.6	O K
7200 min Summer	20.508	0.037	0.1	5.0	O K
8640 min Summer	20.504	0.033	0.1	4.5	O K
10080 min Summer	20.502	0.031	0.1	4.1	O K
15 min Winter	20.493	0.022	0.1	3.0	O K
30 min Winter	20.502	0.031	0.1	4.1	O K
60 min Winter	20.510	0.039	0.1	5.2	O K
120 min Winter	20.518	0.047	0.1	6.3	O K
180 min Winter	20.522	0.051	0.2	6.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	21.4	3280
7200 min Summer	1.360	0.0	22.8	3968
8640 min Summer	1.192	0.0	24.0	4680
10080 min Summer	1.066	0.0	25.0	5440
15 min Winter	87.356	0.0	2.9	23
30 min Winter	60.337	0.0	4.0	37
60 min Winter	39.120	0.0	5.4	66
120 min Winter	24.669	0.0	6.8	124
180 min Winter	18.673	0.0	7.8	182

Cascade Summary of Results for 2. Block D2 (Green Roof).SRCX

	Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m^3)	Status
240	min Winter	20.525	0.054	0.2	7.2	O K
360	min Winter	20.528	0.057	0.2	7.6	O K
480	min Winter	20.529	0.058	0.2	7.7	O K
600	min Winter	20.530	0.059	0.2	7.8	O K
720	min Winter	20.530	0.059	0.2	7.9	O K
960	min Winter	20.530	0.059	0.2	7.9	O K
1440	min Winter	20.528	0.057	0.2	7.6	O K
2160	min Winter	20.523	0.052	0.2	7.0	O K
2880	min Winter	20.518	0.047	0.1	6.4	O K

	Storm Event	Rain (mm/hr)	Flooded Volume (m^3)	Discharge Volume (m^3)	Time-Peak (mins)
240	min Winter	15.302	0.0	8.5	238
360	min Winter	11.522	0.0	9.6	344
480	min Winter	9.408	0.0	10.5	394
600	min Winter	8.035	0.0	11.2	468
720	min Winter	7.061	0.0	11.7	546
960	min Winter	5.757	0.0	12.7	698
1440	min Winter	4.315	0.0	14.2	998
2160	min Winter	3.233	0.0	16.2	1432
2880	min Winter	2.632	0.0	17.6	1848

Cascade Summary of Results for 2. Block D2 (Green Roof).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	20.510	0.039	0.1	5.2	O K
5760 min Winter	20.503	0.032	0.1	4.3	O K
7200 min Winter	20.499	0.028	0.1	3.7	O K
8640 min Winter	20.495	0.024	0.1	3.2	O K
10080 min Winter	20.493	0.022	0.1	2.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	19.8	2600
5760 min Winter	1.598	0.0	21.4	3344
7200 min Winter	1.360	0.0	22.8	4040
8640 min Winter	1.192	0.0	24.0	4760
10080 min Winter	1.066	0.0	25.0	5440

Cascade Rainfall Details for 2. Block D2 (Green Roof).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.014

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.014

Cascade Model Details for 2. Block D2 (Green Roof).SRCX

Storage is Online Cover Level (m) 21.411

Tank or Pond Structure

Invert Level (m) 20.471

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	134.0	0.114	134.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 20.471

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1300	0.049	0.1500	0.065	0.1800
0.030	0.1200	0.041	0.1400	0.057	0.1700	0.068	0.1800

Cascade Summary of Results for 7. Block F1 (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	9. Att Tank - Catchment 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.587	0.031	0.3	9.2	O K
30 min Summer	19.598	0.042	0.3	12.6	O K
60 min Summer	19.609	0.053	0.4	16.0	O K
120 min Summer	19.620	0.064	0.4	19.4	O K
180 min Summer	19.626	0.070	0.5	21.2	O K
240 min Summer	19.630	0.074	0.5	22.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	8.8	23
30 min Summer	60.337	0.0	12.1	37
60 min Summer	39.120	0.0	16.7	66
120 min Summer	24.669	0.0	21.1	126
180 min Summer	18.673	0.0	23.9	186
240 min Summer	15.302	0.0	26.1	244

Cascade Summary of Results for 7. Block F1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	19.634	0.078	0.5	23.4	O K
480 min Summer	19.636	0.080	0.5	24.1	O K
600 min Summer	19.638	0.082	0.5	24.6	O K
720 min Summer	19.639	0.083	0.5	24.9	O K
960 min Summer	19.640	0.084	0.5	25.2	O K
1440 min Summer	19.639	0.083	0.5	25.1	O K
2160 min Summer	19.636	0.080	0.5	24.0	O K
2880 min Summer	19.632	0.076	0.5	22.8	O K
4320 min Summer	19.623	0.067	0.5	20.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	29.5	342
480 min Summer	9.408	0.0	32.1	400
600 min Summer	8.035	0.0	34.2	464
720 min Summer	7.061	0.0	36.0	528
960 min Summer	5.757	0.0	38.9	666
1440 min Summer	4.315	0.0	43.2	942
2160 min Summer	3.233	0.0	49.9	1348
2880 min Summer	2.632	0.0	54.2	1736
4320 min Summer	1.966	0.0	60.6	2516

Cascade Summary of Results for 7. Block F1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	19.616	0.060	0.4	18.0	O K
7200 min Summer	19.610	0.054	0.4	16.2	O K
8640 min Summer	19.605	0.049	0.4	14.7	O K
10080 min Summer	19.601	0.045	0.4	13.4	O K
15 min Winter	19.587	0.031	0.3	9.2	O K
30 min Winter	19.598	0.042	0.3	12.6	O K
60 min Winter	19.609	0.053	0.4	16.0	O K
120 min Winter	19.620	0.064	0.4	19.4	O K
180 min Winter	19.627	0.071	0.5	21.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	65.8	3288
7200 min Summer	1.360	0.0	70.0	4032
8640 min Summer	1.192	0.0	73.6	4752
10080 min Summer	1.066	0.0	76.9	5448
15 min Winter	87.356	0.0	8.8	23
30 min Winter	60.337	0.0	12.1	37
60 min Winter	39.120	0.0	16.7	66
120 min Winter	24.669	0.0	21.1	124
180 min Winter	18.673	0.0	23.9	182

Cascade Summary of Results for 7. Block F1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	19.630	0.074	0.5	22.4	O K
360 min Winter	19.634	0.078	0.5	23.6	O K
480 min Winter	19.636	0.080	0.5	24.1	O K
600 min Winter	19.637	0.081	0.5	24.5	O K
720 min Winter	19.638	0.082	0.5	24.7	O K
960 min Winter	19.638	0.082	0.5	24.7	O K
1440 min Winter	19.636	0.080	0.5	23.9	O K
2160 min Winter	19.630	0.074	0.5	22.2	O K
2880 min Winter	19.623	0.067	0.5	20.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	26.1	238
360 min Winter	11.522	0.0	29.5	346
480 min Winter	9.408	0.0	32.1	442
600 min Winter	8.035	0.0	34.2	476
720 min Winter	7.061	0.0	36.0	554
960 min Winter	5.757	0.0	38.9	708
1440 min Winter	4.315	0.0	43.2	1012
2160 min Winter	3.233	0.0	49.9	1432
2880 min Winter	2.632	0.0	54.2	1848

Cascade Summary of Results for 7. Block F1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	19.612	0.056	0.4	16.8	O K
5760 min Winter	19.603	0.047	0.4	14.2	O K
7200 min Winter	19.597	0.041	0.3	12.2	O K
8640 min Winter	19.591	0.035	0.3	10.7	O K
10080 min Winter	19.587	0.031	0.3	9.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	60.6	2640
5760 min Winter	1.598	0.0	65.8	3400
7200 min Winter	1.360	0.0	70.0	4104
8640 min Winter	1.192	0.0	73.6	4840
10080 min Winter	1.066	0.0	76.9	5544

Cascade Rainfall Details for 7. Block F1 (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.043

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.043

Cascade Model Details for 7. Block F1 (Blue).SRCX

Storage is Online Cover Level (m) 21.900

Tank or Pond Structure

Invert Level (m) 19.556

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	301.0	0.097	301.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 19.556

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.029	0.2800	0.046	0.3700	0.067	0.4500	0.900	0.5300
0.040	0.3400	0.056	0.4100	0.079	0.4900	0.950	0.5400

Cascade Summary of Results for 8. Block F2 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	9. Att Tank - Catchment 1.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	20.568	0.022	0.1	8.0	O K
30 min Summer	20.576	0.030	0.2	11.0	O K
60 min Summer	20.584	0.038	0.2	14.0	O K
120 min Summer	20.593	0.047	0.2	17.3	O K
180 min Summer	20.598	0.052	0.2	19.2	O K
240 min Summer	20.601	0.055	0.3	20.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	6.4	23
30 min Summer	60.337	0.0	8.8	38
60 min Summer	39.120	0.0	13.8	68
120 min Summer	24.669	0.0	17.3	126
180 min Summer	18.673	0.0	19.6	186
240 min Summer	15.302	0.0	21.3	246

Cascade Summary of Results for 8. Block F2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	20.606	0.060	0.3	22.2	O K
480 min Summer	20.609	0.063	0.3	23.2	O K
600 min Summer	20.610	0.064	0.3	23.8	O K
720 min Summer	20.611	0.065	0.3	24.2	O K
960 min Summer	20.613	0.067	0.3	24.8	O K
1440 min Summer	20.615	0.069	0.3	25.5	O K
2160 min Summer	20.615	0.069	0.3	25.6	O K
2880 min Summer	20.614	0.068	0.3	25.2	O K
4320 min Summer	20.611	0.065	0.3	23.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	23.8	366
480 min Summer	9.408	0.0	25.7	484
600 min Summer	8.035	0.0	27.2	590
720 min Summer	7.061	0.0	28.4	644
960 min Summer	5.757	0.0	30.2	762
1440 min Summer	4.315	0.0	32.1	1016
2160 min Summer	3.233	0.0	42.6	1432
2880 min Summer	2.632	0.0	45.9	1848
4320 min Summer	1.966	0.0	50.0	2680

Cascade Summary of Results for 8. Block F2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	20.607	0.061	0.3	22.5	O K
7200 min Summer	20.603	0.057	0.3	21.0	O K
8640 min Summer	20.599	0.053	0.2	19.6	O K
10080 min Summer	20.596	0.050	0.2	18.4	O K
15 min Winter	20.568	0.022	0.1	8.0	O K
30 min Winter	20.576	0.030	0.2	11.0	O K
60 min Winter	20.584	0.038	0.2	14.0	O K
120 min Winter	20.593	0.047	0.2	17.3	O K
180 min Winter	20.598	0.052	0.2	19.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	56.6	3464
7200 min Summer	1.360	0.0	60.2	4248
8640 min Summer	1.192	0.0	63.3	5016
10080 min Summer	1.066	0.0	65.7	5752
15 min Winter	87.356	0.0	6.4	23
30 min Winter	60.337	0.0	8.8	37
60 min Winter	39.120	0.0	13.8	66
120 min Winter	24.669	0.0	17.3	124
180 min Winter	18.673	0.0	19.6	184

Cascade Summary of Results for 8. Block F2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	20.602	0.056	0.3	20.6	O K
360 min Winter	20.606	0.060	0.3	22.3	O K
480 min Winter	20.609	0.063	0.3	23.3	O K
600 min Winter	20.611	0.065	0.3	24.0	O K
720 min Winter	20.612	0.066	0.3	24.4	O K
960 min Winter	20.613	0.067	0.3	24.8	O K
1440 min Winter	20.614	0.068	0.3	25.2	O K
2160 min Winter	20.613	0.067	0.3	24.9	O K
2880 min Winter	20.611	0.065	0.3	24.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	21.3	242
360 min Winter	11.522	0.0	23.8	356
480 min Winter	9.408	0.0	25.7	468
600 min Winter	8.035	0.0	27.2	578
720 min Winter	7.061	0.0	28.4	682
960 min Winter	5.757	0.0	30.2	776
1440 min Winter	4.315	0.0	32.2	1084
2160 min Winter	3.233	0.0	42.6	1540
2880 min Winter	2.632	0.0	45.9	1992

Cascade Summary of Results for 8. Block F2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	20.605	0.059	0.3	21.8	O K
5760 min Winter	20.599	0.053	0.2	19.6	O K
7200 min Winter	20.594	0.048	0.2	17.7	O K
8640 min Winter	20.589	0.043	0.2	15.9	O K
10080 min Winter	20.585	0.039	0.2	14.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	50.0	2856
5760 min Winter	1.598	0.0	56.6	3640
7200 min Winter	1.360	0.0	60.2	4464
8640 min Winter	1.192	0.0	63.3	5192
10080 min Winter	1.066	0.0	65.8	5952

Cascade Rainfall Details for 8. Block F2 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.037

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.037

Cascade Model Details for 8. Block F2 (Green).SRCX

Storage is Online Cover Level (m) 21.800

Tank or Pond Structure

Invert Level (m) 20.546

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	370.0	0.114	370.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 20.546

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1500	0.034	0.2000	0.050	0.2400	0.070	0.2900	0.082	0.3100
0.030	0.1800	0.042	0.2200	0.060	0.2600	0.075	0.3000		

STORMTECH Stormwater Management System Design Tool

ver: Jun14

PROJECT REF:	190226 - Attenuation Tank - Catchment 2
LOCATION:	Sandford
DATE:	10.12.2025
CREATED BY:	ED

Instructions:
- Fill in blue highlighted cells
- Set width to maximum allowance
- Adjust site parameters and system dimension until volume achieved
- For Rectangular systems only, for irregular shape dig contact Microstrain

SYSTEM PARAMETERS

Required Total Storage	181.4	m^3
Stormtech chamber model	MC3500	
Number of Isolator Rows for TSS Removal	1	

SITE PARAMETERS

Maximum Width at Excavation Base	16	m	
Stone Porosity	40%		
Excavation Batter Angle (degrees)	60	°	*Minimum Requirement*
Stone Below Chambers	0.3	m	*0.23*
Stone Above Chambers	0.35	m	*0.30*
Additional Storage. E.g manholes, pipe	0	m^3	

CALCULATED CHAMBER SYSTEM DIMENSIONS

	Calculated	Adopted	
Number of Rows	7		ea
Number of units per Row	4		ea
Number of MC3500 Chambers	28		ea
Number of MC3500 Endcaps	14		ea
System Installed Storage Depth (effective storage depth)	1.795		m
Tank overall installed Width at base	15.67	17	m
Tank overall installed Length at Base	10.46	11	m
Total Effective System Storage	**196.3**	**214.3**	m^3

STORMTECH SYSTEM DETAIL

StormTech Chamber Model	MC3500	
Unit Width	1.955	m
Unit Length	2.18	m
Unit Height	1.145	m
Min Cover Over System	0.3	m
Max Cover Over Chamber	2.4	m
Internal Storage Vol. (Chamber only)	3.11	m^3

STONE AND EXCAVATION DETAIL

Volume of Dig for System	392	
Area of Dig at Base of System	187	m^2
Area of Dig at Top of System	249	m^2
Void Ratio	55%	
Stone Requirement - tonne	486	tonne

StormTech®
Detention • Retention • Recharge
Subsurface Stormwater Management™

Cascade Summary of Results for 12. Att Tank - Catchment 2.SRCX

Upstream Structures	Outflow To	Overflow To
1. Block C1 (Green).SRCX	15. Pond 2 - Catchment 3.SRCX	(None)
2. Block C2 (Green).SRCX		
3. Block C3 (Green).SRCX		
4. Block C4 (Green).SRCX		
5. Block C5 (Green).SRCX		
6. Podium C (Blue).SRCX		
7. Block C7 (Green).SRCX		
8. Block B3 (Blue).SRCX		
9. Block B4 (Green).SRCX		
10. Block A2 (Green).SRCX		
11. Podium A (Blue).SRCX		

Half Drain Time : 417 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)

Cascade Summary of Results for 12. Att Tank - Catchment 2.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	16.914	0.471	0.0	4.1	4.1	52.9	O K
30 min Summer	17.094	0.651	0.0	4.1	4.1	73.0	O K
60 min Summer	17.284	0.841	0.0	4.1	4.1	94.3	O K
120 min Summer	17.488	1.045	0.0	4.1	4.1	117.2	O K
180 min Summer	17.611	1.168	0.0	4.1	4.1	131.0	O K
240 min Summer	17.702	1.259	0.0	4.1	4.1	141.2	O K
360 min Summer	17.831	1.388	0.0	4.2	4.2	155.7	O K
480 min Summer	17.924	1.481	0.0	4.3	4.3	166.2	O K
600 min Summer	17.996	1.553	0.0	4.4	4.4	174.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	145.9	22
30 min Summer	60.337	0.0	201.1	37
60 min Summer	39.120	0.0	300.1	68
120 min Summer	24.669	0.0	377.0	128
180 min Summer	18.673	0.0	426.3	188
240 min Summer	15.302	0.0	464.1	248
360 min Summer	11.522	0.0	520.4	368
480 min Summer	9.408	0.0	562.4	488
600 min Summer	8.035	0.0	595.9	606

Cascade Summary of Results for 12. Att Tank - Catchment 2.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	18.053	1.610	0.0	4.5	4.5	180.6	O K
960 min Summer	18.138	1.695	0.0	4.6	4.6	190.1	O K
1440 min Summer	18.227	1.784	0.0	4.7	4.7	200.1	O K
2160 min Summer	18.359	1.916	0.0	4.8	4.8	201.6	O K
2880 min Summer	18.234	1.791	0.0	4.7	4.7	200.9	O K
4320 min Summer	18.182	1.739	0.0	4.6	4.6	195.1	O K
5760 min Summer	18.107	1.664	0.0	4.5	4.5	186.6	O K
7200 min Summer	18.018	1.575	0.0	4.4	4.4	176.7	O K
8640 min Summer	17.923	1.480	0.0	4.3	4.3	166.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	7.061	0.0	623.5	726
960 min Summer	5.757	0.0	651.6	966
1440 min Summer	4.315	0.0	639.1	1442
2160 min Summer	3.233	0.0	923.0	1864
2880 min Summer	2.632	0.0	994.9	2312
4320 min Summer	1.966	0.0	1086.5	3080
5760 min Summer	1.598	0.0	1231.7	3872
7200 min Summer	1.360	0.0	1310.0	4688
8640 min Summer	1.192	0.0	1376.1	5528

Cascade Summary of Results for 12. Att Tank - Catchment 2.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	17.827	1.384	0.0	4.2	4.2	155.2	O K
15 min Winter	16.914	0.471	0.0	4.1	4.1	52.9	O K
30 min Winter	17.093	0.650	0.0	4.1	4.1	73.0	O K
60 min Winter	17.283	0.840	0.0	4.1	4.1	94.3	O K
120 min Winter	17.487	1.044	0.0	4.1	4.1	117.2	O K
180 min Winter	17.611	1.168	0.0	4.1	4.1	131.1	O K
240 min Winter	17.703	1.260	0.0	4.1	4.1	141.3	O K
360 min Winter	17.833	1.390	0.0	4.2	4.2	156.0	O K
480 min Winter	17.926	1.483	0.0	4.3	4.3	166.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.066	0.0	1428.5	6344
15 min Winter	87.356	0.0	145.9	22
30 min Winter	60.337	0.0	201.1	37
60 min Winter	39.120	0.0	300.1	68
120 min Winter	24.669	0.0	377.0	126
180 min Winter	18.673	0.0	426.4	186
240 min Winter	15.302	0.0	464.1	246
360 min Winter	11.522	0.0	520.4	364
480 min Winter	9.408	0.0	562.5	482

Cascade Summary of Results for 12. Att Tank - Catchment 2.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
600 min Winter	17.998	1.555	0.0	4.4	4.4	174.4	O K
720 min Winter	18.055	1.612	0.0	4.5	4.5	180.8	O K
960 min Winter	18.138	1.695	0.0	4.6	4.6	190.2	O K
1440 min Winter	18.226	1.783	0.0	4.7	4.7	200.0	O K
2160 min Winter	18.302	1.859	0.0	4.8	4.8	201.5	O K
2880 min Winter	18.201	1.758	0.0	4.7	4.7	197.3	O K
4320 min Winter	18.099	1.656	0.0	4.5	4.5	185.8	O K
5760 min Winter	17.957	1.514	0.0	4.3	4.3	169.9	O K
7200 min Winter	17.796	1.353	0.0	4.1	4.1	151.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	8.035	0.0	596.1	600
720 min Winter	7.061	0.0	623.6	718
960 min Winter	5.757	0.0	652.5	952
1440 min Winter	4.315	0.0	640.4	1404
2160 min Winter	3.233	0.0	923.1	1996
2880 min Winter	2.632	0.0	995.1	2364
4320 min Winter	1.966	0.0	1087.1	3216
5760 min Winter	1.598	0.0	1231.7	4104
7200 min Winter	1.360	0.0	1310.0	5000

Cascade Summary of Results for 12. Att Tank - Catchment 2.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
8640 min Winter	17.617	1.174	0.0	4.1	4.1	131.7	O K
10080 min Winter	17.367	0.924	0.0	4.1	4.1	103.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Winter	1.192	0.0	1376.2	5896
10080 min Winter	1.066	0.0	1429.2	6960

Cascade Rainfall Details for 12. Att Tank - Catchment 2.SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.253

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.133	4	8	0.120

Cascade Model Details for 12. Att Tank - Catchment 2.SRCX

Storage is Online Cover Level (m) 18.800

Cellular Storage Structure

Invert Level (m) 16.443 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.60
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	187.0	187.0	1.795	187.0	187.0	1.796	0.0	187.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0091-4700-1795-4700	Sump Available	Yes
Design Head (m)	1.795	Diameter (mm)	91
Design Flow (l/s)	4.7	Invert Level (m)	16.443
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.795	4.7	Kick-Flo®	0.814	3.3
Flush-Flo™	0.400	4.1	Mean Flow over Head Range	-	3.8

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

Hydro-Brake® Optimum Outflow Control

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.9	0.600	3.9	1.600	4.5	2.600	5.6	5.000	7.6	7.500	9.2
0.200	3.8	0.800	3.3	1.800	4.7	3.000	6.0	5.500	7.9	8.000	9.5
0.300	4.0	1.000	3.6	2.000	4.9	3.500	6.4	6.000	8.3	8.500	9.8
0.400	4.1	1.200	3.9	2.200	5.2	4.000	6.8	6.500	8.6	9.000	10.0
0.500	4.0	1.400	4.2	2.400	5.4	4.500	7.2	7.000	8.9	9.500	10.3

Cascade Summary of Results for 11. Podium A (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	16.614	0.022	0.8	43.5	O K
30 min Summer	16.622	0.030	0.9	59.6	O K
60 min Summer	16.630	0.038	1.1	76.4	O K
120 min Summer	16.639	0.047	1.2	94.2	O K
180 min Summer	16.644	0.052	1.3	104.7	O K
240 min Summer	16.648	0.056	1.3	112.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	34.0	23
30 min Summer	60.337	0.0	46.6	38
60 min Summer	39.120	0.0	74.3	68
120 min Summer	24.669	0.0	93.2	126
180 min Summer	18.673	0.0	105.2	186
240 min Summer	15.302	0.0	114.3	246

Cascade Summary of Results for 11. Podium A (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	16.652	0.060	1.4	121.4	O K
480 min Summer	16.655	0.063	1.4	127.0	O K
600 min Summer	16.657	0.065	1.4	130.4	O K
720 min Summer	16.658	0.066	1.5	132.7	O K
960 min Summer	16.660	0.068	1.5	136.3	O K
1440 min Summer	16.662	0.070	1.5	140.1	O K
2160 min Summer	16.662	0.070	1.5	141.2	O K
2880 min Summer	16.662	0.070	1.5	139.6	O K
4320 min Summer	16.658	0.066	1.5	133.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	127.8	366
480 min Summer	9.408	0.0	137.8	484
600 min Summer	8.035	0.0	145.5	602
720 min Summer	7.061	0.0	151.8	658
960 min Summer	5.757	0.0	161.0	772
1440 min Summer	4.315	0.0	170.5	1028
2160 min Summer	3.233	0.0	230.6	1452
2880 min Summer	2.632	0.0	248.3	1852
4320 min Summer	1.966	0.0	269.1	2684

Cascade Summary of Results for 11. Podium A (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	16.654	0.062	1.4	125.2	O K
7200 min Summer	16.651	0.059	1.4	117.6	O K
8640 min Summer	16.647	0.055	1.3	110.5	O K
10080 min Summer	16.644	0.052	1.3	104.0	O K
15 min Winter	16.614	0.022	0.8	43.5	O K
30 min Winter	16.622	0.030	0.9	59.7	O K
60 min Winter	16.630	0.038	1.1	76.4	O K
120 min Winter	16.639	0.047	1.2	94.2	O K
180 min Winter	16.644	0.052	1.3	104.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	307.3	3464
7200 min Summer	1.360	0.0	327.0	4248
8640 min Summer	1.192	0.0	343.9	5016
10080 min Summer	1.066	0.0	356.6	5752
15 min Winter	87.356	0.0	34.0	23
30 min Winter	60.337	0.0	46.6	37
60 min Winter	39.120	0.0	74.3	66
120 min Winter	24.669	0.0	93.2	124
180 min Winter	18.673	0.0	105.2	184

Cascade Summary of Results for 11. Podium A (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	16.648	0.056	1.3	112.2	O K
360 min Winter	16.653	0.061	1.4	121.7	O K
480 min Winter	16.656	0.064	1.4	127.6	O K
600 min Winter	16.657	0.065	1.4	131.3	O K
720 min Winter	16.659	0.067	1.5	133.6	O K
960 min Winter	16.660	0.068	1.5	136.0	O K
1440 min Winter	16.661	0.069	1.5	138.7	O K
2160 min Winter	16.660	0.068	1.5	137.4	O K
2880 min Winter	16.658	0.066	1.5	133.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	114.3	242
360 min Winter	11.522	0.0	127.8	356
480 min Winter	9.408	0.0	137.8	470
600 min Winter	8.035	0.0	145.6	580
720 min Winter	7.061	0.0	151.8	684
960 min Winter	5.757	0.0	161.1	792
1440 min Winter	4.315	0.0	170.7	1086
2160 min Winter	3.233	0.0	230.7	1544
2880 min Winter	2.632	0.0	248.3	1992

Cascade Summary of Results for 11. Podium A (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	16.653	0.061	1.4	122.0	O K
5760 min Winter	16.647	0.055	1.3	110.9	O K
7200 min Winter	16.642	0.050	1.2	100.6	O K
8640 min Winter	16.637	0.045	1.2	91.4	O K
10080 min Winter	16.633	0.041	1.1	83.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	269.3	2856
5760 min Winter	1.598	0.0	307.3	3680
7200 min Winter	1.360	0.0	327.0	4464
8640 min Winter	1.192	0.0	343.9	5272
10080 min Winter	1.066	0.0	356.8	5960

Cascade Rainfall Details for 11. Podium A (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.201

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.201

Cascade Model Details for 11. Podium A (Blue).SRCX

Storage is Online Cover Level (m) 18.800

Tank or Pond Structure

Invert Level (m) 16.592

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2008.0	0.097	2008.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 16.592

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.7700	0.034	1.0100	0.050	1.2400	0.069	1.4900	0.082	1.6300
0.030	0.9300	0.041	1.1200	0.059	1.3700	0.075	1.5600		

Cascade Summary of Results for 6. Podium C (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.505	0.021	0.1	4.7	O K
30 min Summer	17.513	0.029	0.1	6.5	O K
60 min Summer	17.521	0.037	0.1	8.3	O K
120 min Summer	17.530	0.046	0.1	10.2	O K
180 min Summer	17.535	0.051	0.2	11.4	O K
240 min Summer	17.538	0.054	0.2	12.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	4.0	23
30 min Summer	60.337	0.0	5.4	38
60 min Summer	39.120	0.0	8.3	68
120 min Summer	24.669	0.0	10.4	126
180 min Summer	18.673	0.0	11.8	186
240 min Summer	15.302	0.0	12.8	246

Cascade Summary of Results for 6. Podium C (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	17.543	0.059	0.2	13.1	O K
480 min Summer	17.545	0.061	0.2	13.6	O K
600 min Summer	17.546	0.062	0.2	13.9	O K
720 min Summer	17.547	0.063	0.2	14.1	O K
960 min Summer	17.549	0.065	0.2	14.5	O K
1440 min Summer	17.551	0.067	0.2	14.8	O K
2160 min Summer	17.551	0.067	0.2	14.8	O K
2880 min Summer	17.549	0.065	0.2	14.5	O K
4320 min Summer	17.545	0.061	0.2	13.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	14.4	364
480 min Summer	9.408	0.0	15.6	484
600 min Summer	8.035	0.0	16.5	564
720 min Summer	7.061	0.0	17.2	618
960 min Summer	5.757	0.0	18.4	744
1440 min Summer	4.315	0.0	19.7	1012
2160 min Summer	3.233	0.0	25.4	1428
2880 min Summer	2.632	0.0	27.5	1824
4320 min Summer	1.966	0.0	30.1	2640

Cascade Summary of Results for 6. Podium C (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	17.541	0.057	0.2	12.7	O K
7200 min Summer	17.537	0.053	0.2	11.9	O K
8640 min Summer	17.534	0.050	0.2	11.1	O K
10080 min Summer	17.530	0.046	0.1	10.3	O K
15 min Winter	17.505	0.021	0.1	4.7	O K
30 min Winter	17.513	0.029	0.1	6.5	O K
60 min Winter	17.521	0.037	0.1	8.3	O K
120 min Winter	17.530	0.046	0.1	10.3	O K
180 min Winter	17.535	0.051	0.2	11.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	33.6	3408
7200 min Summer	1.360	0.0	35.8	4184
8640 min Summer	1.192	0.0	37.6	4936
10080 min Summer	1.066	0.0	39.2	5744
15 min Winter	87.356	0.0	4.0	23
30 min Winter	60.337	0.0	5.4	37
60 min Winter	39.120	0.0	8.3	66
120 min Winter	24.669	0.0	10.4	124
180 min Winter	18.673	0.0	11.8	184

Cascade Summary of Results for 6. Podium C (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	17.538	0.054	0.2	12.1	O K
360 min Winter	17.543	0.059	0.2	13.1	O K
480 min Winter	17.545	0.061	0.2	13.7	O K
600 min Winter	17.547	0.063	0.2	14.0	O K
720 min Winter	17.548	0.064	0.2	14.2	O K
960 min Winter	17.549	0.065	0.2	14.5	O K
1440 min Winter	17.550	0.066	0.2	14.6	O K
2160 min Winter	17.548	0.064	0.2	14.3	O K
2880 min Winter	17.545	0.061	0.2	13.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	12.8	242
360 min Winter	11.522	0.0	14.4	356
480 min Winter	9.408	0.0	15.6	466
600 min Winter	8.035	0.0	16.5	574
720 min Winter	7.061	0.0	17.2	674
960 min Winter	5.757	0.0	18.4	764
1440 min Winter	4.315	0.0	19.7	1072
2160 min Winter	3.233	0.0	25.4	1520
2880 min Winter	2.632	0.0	27.5	1964

Cascade Summary of Results for 6. Podium C (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	17.539	0.055	0.2	12.4	O K
5760 min Winter	17.534	0.050	0.2	11.1	O K
7200 min Winter	17.528	0.044	0.1	9.9	O K
8640 min Winter	17.524	0.040	0.1	9.0	O K
10080 min Winter	17.521	0.037	0.1	8.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	30.1	2812
5760 min Winter	1.598	0.0	33.6	3632
7200 min Winter	1.360	0.0	35.8	4392
8640 min Winter	1.192	0.0	37.6	5104
10080 min Winter	1.066	0.0	39.2	5944

Cascade Rainfall Details for 6. Podium C (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.022

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.022

Cascade Model Details for 6. Podium C (Blue).SRCX

Storage is Online Cover Level (m) 21.200

Tank or Pond Structure

Invert Level (m) 17.484

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	223.0	0.097	223.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 17.484

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.049	0.1500	0.068	0.1800	0.079	0.2000
0.029	0.1100	0.041	0.1400	0.058	0.1700	0.073	0.1900		

Cascade Summary of Results for 10. Block A2 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.037	0.022	0.3	19.0	O K
30 min Summer	17.045	0.030	0.4	26.2	O K
60 min Summer	17.054	0.039	0.4	33.6	O K
120 min Summer	17.063	0.048	0.5	41.5	O K
180 min Summer	17.068	0.053	0.5	46.2	O K
240 min Summer	17.072	0.057	0.5	49.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	14.2	23
30 min Summer	60.337	0.0	19.5	38
60 min Summer	39.120	0.0	31.9	68
120 min Summer	24.669	0.0	39.9	128
180 min Summer	18.673	0.0	44.9	186
240 min Summer	15.302	0.0	48.7	246

Cascade Summary of Results for 10. Block A2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	17.077	0.062	0.5	54.0	O K
480 min Summer	17.081	0.066	0.6	56.7	O K
600 min Summer	17.083	0.068	0.6	58.5	O K
720 min Summer	17.084	0.069	0.6	59.7	O K
960 min Summer	17.086	0.071	0.6	61.3	O K
1440 min Summer	17.088	0.073	0.6	63.2	O K
2160 min Summer	17.089	0.074	0.6	64.2	O K
2880 min Summer	17.089	0.074	0.6	63.8	O K
4320 min Summer	17.086	0.071	0.6	61.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	54.3	366
480 min Summer	9.408	0.0	58.3	484
600 min Summer	8.035	0.0	61.4	604
720 min Summer	7.061	0.0	63.8	706
960 min Summer	5.757	0.0	67.1	814
1440 min Summer	4.315	0.0	69.8	1060
2160 min Summer	3.233	0.0	100.0	1476
2880 min Summer	2.632	0.0	107.2	1880
4320 min Summer	1.966	0.0	114.6	2724

Cascade Summary of Results for 10. Block A2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	17.083	0.068	0.6	58.5	O K
7200 min Summer	17.079	0.064	0.5	55.4	O K
8640 min Summer	17.076	0.061	0.5	52.4	O K
10080 min Summer	17.072	0.057	0.5	49.6	O K
15 min Winter	17.037	0.022	0.3	19.0	O K
30 min Winter	17.045	0.030	0.4	26.2	O K
60 min Winter	17.054	0.039	0.4	33.6	O K
120 min Winter	17.063	0.048	0.5	41.5	O K
180 min Winter	17.069	0.054	0.5	46.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	134.6	3520
7200 min Summer	1.360	0.0	143.2	4320
8640 min Summer	1.192	0.0	150.3	5096
10080 min Summer	1.066	0.0	155.5	5848
15 min Winter	87.356	0.0	14.2	23
30 min Winter	60.337	0.0	19.5	37
60 min Winter	39.120	0.0	31.9	66
120 min Winter	24.669	0.0	39.9	126
180 min Winter	18.673	0.0	44.9	184

Cascade Summary of Results for 10. Block A2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	17.072	0.057	0.5	49.6	O K
360 min Winter	17.078	0.063	0.5	54.1	O K
480 min Winter	17.081	0.066	0.6	56.9	O K
600 min Winter	17.083	0.068	0.6	58.8	O K
720 min Winter	17.085	0.070	0.6	60.1	O K
960 min Winter	17.086	0.071	0.6	61.4	O K
1440 min Winter	17.088	0.073	0.6	62.9	O K
2160 min Winter	17.088	0.073	0.6	62.9	O K
2880 min Winter	17.086	0.071	0.6	61.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	48.8	242
360 min Winter	11.522	0.0	54.3	358
480 min Winter	9.408	0.0	58.3	472
600 min Winter	8.035	0.0	61.4	582
720 min Winter	7.061	0.0	63.8	690
960 min Winter	5.757	0.0	67.2	896
1440 min Winter	4.315	0.0	69.9	1114
2160 min Winter	3.233	0.0	100.0	1580
2880 min Winter	2.632	0.0	107.2	2024

Cascade Summary of Results for 10. Block A2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	17.081	0.066	0.6	57.4	O K
5760 min Winter	17.076	0.061	0.5	52.7	O K
7200 min Winter	17.071	0.056	0.5	48.4	O K
8640 min Winter	17.066	0.051	0.5	44.4	O K
10080 min Winter	17.062	0.047	0.5	40.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	114.7	2900
5760 min Winter	1.598	0.0	134.6	3744
7200 min Winter	1.360	0.0	143.2	4544
8640 min Winter	1.192	0.0	150.3	5352
10080 min Winter	1.066	0.0	155.6	6056

Cascade Rainfall Details for 10. Block A2 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.088

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.088

Cascade Model Details for 10. Block A2 (Green).SRCX

Storage is Online Cover Level (m) 18.600

Tank or Pond Structure

Invert Level (m) 17.015

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	864.0	0.114	864.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 17.015

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.3000	0.035	0.3900	0.050	0.4800	0.071	0.5800	0.086	0.6400
0.030	0.3600	0.042	0.4400	0.060	0.5300	0.077	0.6100	0.087	0.6500

Cascade Summary of Results for 8. Block B3 (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	(None)	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.186	0.030	0.3	9.9	O K
30 min Summer	17.197	0.041	0.3	13.5	O K
60 min Summer	17.208	0.052	0.4	17.2	O K
120 min Summer	17.219	0.063	0.4	20.9	O K
180 min Summer	17.225	0.069	0.5	22.9	O K
240 min Summer	17.229	0.073	0.5	24.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	9.3	23
30 min Summer	60.337	0.0	12.8	37
60 min Summer	39.120	0.0	17.8	68
120 min Summer	24.669	0.0	22.5	126
180 min Summer	18.673	0.0	25.5	186
240 min Summer	15.302	0.0	27.9	246

Cascade Summary of Results for 8. Block B3 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	17.233	0.077	0.5	25.5	O K
480 min Summer	17.236	0.080	0.5	26.3	O K
600 min Summer	17.237	0.081	0.5	26.8	O K
720 min Summer	17.238	0.082	0.5	27.1	O K
960 min Summer	17.239	0.083	0.5	27.5	O K
1440 min Summer	17.239	0.083	0.5	27.5	O K
2160 min Summer	17.237	0.081	0.5	26.7	O K
2880 min Summer	17.233	0.077	0.5	25.5	O K
4320 min Summer	17.225	0.069	0.5	22.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	31.4	362
480 min Summer	9.408	0.0	34.2	412
600 min Summer	8.035	0.0	36.4	474
720 min Summer	7.061	0.0	38.3	538
960 min Summer	5.757	0.0	41.4	670
1440 min Summer	4.315	0.0	45.8	944
2160 min Summer	3.233	0.0	53.4	1364
2880 min Summer	2.632	0.0	57.9	1764
4320 min Summer	1.966	0.0	64.8	2556

Cascade Summary of Results for 8. Block B3 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	17.218	0.062	0.4	20.5	O K
7200 min Summer	17.212	0.056	0.4	18.6	O K
8640 min Summer	17.207	0.051	0.4	16.9	O K
10080 min Summer	17.203	0.047	0.4	15.5	O K
15 min Winter	17.186	0.030	0.3	9.9	O K
30 min Winter	17.197	0.041	0.3	13.5	O K
60 min Winter	17.208	0.052	0.4	17.2	O K
120 min Winter	17.219	0.063	0.4	20.9	O K
180 min Winter	17.225	0.069	0.5	22.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	70.4	3296
7200 min Summer	1.360	0.0	74.9	4040
8640 min Summer	1.192	0.0	78.8	4760
10080 min Summer	1.066	0.0	82.2	5544
15 min Winter	87.356	0.0	9.3	23
30 min Winter	60.337	0.0	12.8	37
60 min Winter	39.120	0.0	17.8	66
120 min Winter	24.669	0.0	22.5	124
180 min Winter	18.673	0.0	25.5	182

Cascade Summary of Results for 8. Block B3 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	17.229	0.073	0.5	24.2	O K
360 min Winter	17.234	0.078	0.5	25.7	O K
480 min Winter	17.236	0.080	0.5	26.3	O K
600 min Winter	17.237	0.081	0.5	26.7	O K
720 min Winter	17.238	0.082	0.5	27.0	O K
960 min Winter	17.238	0.082	0.5	27.1	O K
1440 min Winter	17.237	0.081	0.5	26.6	O K
2160 min Winter	17.231	0.075	0.5	24.9	O K
2880 min Winter	17.226	0.070	0.5	23.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	27.9	238
360 min Winter	11.522	0.0	31.5	350
480 min Winter	9.408	0.0	34.2	452
600 min Winter	8.035	0.0	36.4	486
720 min Winter	7.061	0.0	38.3	560
960 min Winter	5.757	0.0	41.4	716
1440 min Winter	4.315	0.0	45.8	1016
2160 min Winter	3.233	0.0	53.4	1456
2880 min Winter	2.632	0.0	57.9	1876

Cascade Summary of Results for 8. Block B3 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	17.215	0.059	0.4	19.4	O K
5760 min Winter	17.206	0.050	0.4	16.5	O K
7200 min Winter	17.199	0.043	0.4	14.2	O K
8640 min Winter	17.193	0.037	0.3	12.3	O K
10080 min Winter	17.189	0.033	0.3	10.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	64.8	2680
5760 min Winter	1.598	0.0	70.4	3456
7200 min Winter	1.360	0.0	74.9	4176
8640 min Winter	1.192	0.0	78.8	4920
10080 min Winter	1.066	0.0	82.2	5568

Cascade Rainfall Details for 8. Block B3 (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.046

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.046

Cascade Model Details for 8. Block B3 (Blue).SRCX

Storage is Online Cover Level (m) 20.530

Tank or Pond Structure

Invert Level (m) 17.156

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	330.0	0.097	330.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 17.156

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.028	0.2800	0.045	0.3600	0.065	0.4400	0.088	0.5200	0.095	0.5400
0.038	0.3300	0.054	0.4000	0.077	0.4800	0.093	0.5300		

Cascade Summary of Results for 9. Block B4 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.015	0.022	0.1	8.2	O K
30 min Summer	17.023	0.030	0.1	11.3	O K
60 min Summer	17.031	0.038	0.1	14.6	O K
120 min Summer	17.041	0.048	0.1	18.1	O K
180 min Summer	17.047	0.054	0.2	20.3	O K
240 min Summer	17.051	0.058	0.2	21.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	5.3	23
30 min Summer	60.337	0.0	7.3	38
60 min Summer	39.120	0.0	12.8	68
120 min Summer	24.669	0.0	15.9	128
180 min Summer	18.673	0.0	17.7	186
240 min Summer	15.302	0.0	19.1	246

Cascade Summary of Results for 9. Block B4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	17.056	0.063	0.2	24.0	O K
480 min Summer	17.060	0.067	0.2	25.5	O K
600 min Summer	17.063	0.070	0.2	26.5	O K
720 min Summer	17.065	0.072	0.2	27.3	O K
960 min Summer	17.067	0.074	0.2	28.2	O K
1440 min Summer	17.070	0.077	0.2	29.3	O K
2160 min Summer	17.072	0.079	0.2	30.1	O K
2880 min Summer	17.073	0.080	0.2	30.3	O K
4320 min Summer	17.072	0.079	0.2	30.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	20.9	366
480 min Summer	9.408	0.0	22.2	486
600 min Summer	8.035	0.0	23.1	606
720 min Summer	7.061	0.0	23.7	724
960 min Summer	5.757	0.0	24.4	960
1440 min Summer	4.315	0.0	24.7	1186
2160 min Summer	3.233	0.0	41.1	1564
2880 min Summer	2.632	0.0	43.2	1968
4320 min Summer	1.966	0.0	43.8	2812

Cascade Summary of Results for 9. Block B4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	17.070	0.077	0.2	29.2	O K
7200 min Summer	17.067	0.074	0.2	28.1	O K
8640 min Summer	17.064	0.071	0.2	27.1	O K
10080 min Summer	17.062	0.069	0.2	26.0	O K
15 min Winter	17.015	0.022	0.1	8.2	O K
30 min Winter	17.023	0.030	0.1	11.3	O K
60 min Winter	17.031	0.038	0.1	14.6	O K
120 min Winter	17.041	0.048	0.1	18.1	O K
180 min Winter	17.047	0.054	0.2	20.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	58.0	3632
7200 min Summer	1.360	0.0	61.4	4464
8640 min Summer	1.192	0.0	63.9	5264
10080 min Summer	1.066	0.0	65.5	6048
15 min Winter	87.356	0.0	5.3	23
30 min Winter	60.337	0.0	7.3	37
60 min Winter	39.120	0.0	12.8	68
120 min Winter	24.669	0.0	15.9	126
180 min Winter	18.673	0.0	17.7	184

Cascade Summary of Results for 9. Block B4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	17.051	0.058	0.2	21.9	O K
360 min Winter	17.056	0.063	0.2	24.1	O K
480 min Winter	17.060	0.067	0.2	25.5	O K
600 min Winter	17.063	0.070	0.2	26.6	O K
720 min Winter	17.065	0.072	0.2	27.4	O K
960 min Winter	17.068	0.075	0.2	28.4	O K
1440 min Winter	17.070	0.077	0.2	29.3	O K
2160 min Winter	17.072	0.079	0.2	29.9	O K
2880 min Winter	17.072	0.079	0.2	29.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	19.1	244
360 min Winter	11.522	0.0	20.9	360
480 min Winter	9.408	0.0	22.2	476
600 min Winter	8.035	0.0	23.1	590
720 min Winter	7.061	0.0	23.7	704
960 min Winter	5.757	0.0	24.4	924
1440 min Winter	4.315	0.0	24.7	1314
2160 min Winter	3.233	0.0	41.1	1648
2880 min Winter	2.632	0.0	43.3	2108

Cascade Summary of Results for 9. Block B4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	17.069	0.076	0.2	28.8	O K
5760 min Winter	17.065	0.072	0.2	27.3	O K
7200 min Winter	17.061	0.068	0.2	25.8	O K
8640 min Winter	17.057	0.064	0.2	24.3	O K
10080 min Winter	17.053	0.060	0.2	22.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	43.9	3028
5760 min Winter	1.598	0.0	58.0	3864
7200 min Winter	1.360	0.0	61.4	4752
8640 min Winter	1.192	0.0	64.0	5536
10080 min Winter	1.066	0.0	65.5	6360

Cascade Rainfall Details for 9. Block B4 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.038

Time From: (mins)	To: (mins)	Area (ha)	Time From: (mins)	To: (mins)	Area (ha)
0	4	0.000	4	8	0.038

Time Area Diagram

Total Area (ha) 0.000

Time From: (mins)	To: (mins)	Area (ha)
0	4	0.000

Cascade Model Details for 9. Block B4 (Green).SRCX

Storage is Online Cover Level (m) 19.875

Tank or Pond Structure

Invert Level (m) 16.993

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	379.0	0.114	379.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 16.993

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1300	0.049	0.1500	0.071	0.1900	0.089	0.2100
0.029	0.1200	0.041	0.1400	0.060	0.1700	0.078	0.2000	0.095	0.2200

Cascade Summary of Results for 1. Block C1 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.712	0.022	0.2	9.1	O K
30 min Summer	19.721	0.031	0.2	12.5	O K
60 min Summer	19.730	0.040	0.2	16.0	O K
120 min Summer	19.739	0.049	0.2	19.7	O K
180 min Summer	19.744	0.054	0.3	21.9	O K
240 min Summer	19.748	0.058	0.3	23.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	7.0	23
30 min Summer	60.337	0.0	9.5	38
60 min Summer	39.120	0.0	15.4	68
120 min Summer	24.669	0.0	19.3	126
180 min Summer	18.673	0.0	21.8	186
240 min Summer	15.302	0.0	23.6	246

Cascade Summary of Results for 1. Block C1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	19.753	0.063	0.3	25.5	O K
480 min Summer	19.756	0.066	0.3	26.8	O K
600 min Summer	19.758	0.068	0.3	27.5	O K
720 min Summer	19.759	0.069	0.3	28.0	O K
960 min Summer	19.761	0.071	0.3	28.7	O K
1440 min Summer	19.763	0.073	0.3	29.6	O K
2160 min Summer	19.764	0.074	0.3	29.9	O K
2880 min Summer	19.763	0.073	0.3	29.7	O K
4320 min Summer	19.760	0.070	0.3	28.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	26.4	366
480 min Summer	9.408	0.0	28.4	484
600 min Summer	8.035	0.0	30.0	604
720 min Summer	7.061	0.0	31.2	674
960 min Summer	5.757	0.0	33.0	782
1440 min Summer	4.315	0.0	34.7	1042
2160 min Summer	3.233	0.0	48.0	1452
2880 min Summer	2.632	0.0	51.6	1876
4320 min Summer	1.966	0.0	55.7	2684

Cascade Summary of Results for 1. Block C1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	19.757	0.067	0.3	26.9	O K
7200 min Summer	19.753	0.063	0.3	25.4	O K
8640 min Summer	19.749	0.059	0.3	23.9	O K
10080 min Summer	19.746	0.056	0.3	22.5	O K
15 min Winter	19.712	0.022	0.2	9.1	O K
30 min Winter	19.721	0.031	0.2	12.5	O K
60 min Winter	19.730	0.040	0.2	16.0	O K
120 min Winter	19.739	0.049	0.2	19.7	O K
180 min Winter	19.744	0.054	0.3	22.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	64.2	3464
7200 min Summer	1.360	0.0	68.3	4256
8640 min Summer	1.192	0.0	71.8	5024
10080 min Summer	1.066	0.0	74.4	5760
15 min Winter	87.356	0.0	7.0	23
30 min Winter	60.337	0.0	9.5	37
60 min Winter	39.120	0.0	15.4	66
120 min Winter	24.669	0.0	19.3	126
180 min Winter	18.673	0.0	21.8	184

Cascade Summary of Results for 1. Block C1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	19.748	0.058	0.3	23.5	O K
360 min Winter	19.753	0.063	0.3	25.6	O K
480 min Winter	19.756	0.066	0.3	26.9	O K
600 min Winter	19.759	0.069	0.3	27.7	O K
720 min Winter	19.760	0.070	0.3	28.2	O K
960 min Winter	19.761	0.071	0.3	28.7	O K
1440 min Winter	19.763	0.073	0.3	29.4	O K
2160 min Winter	19.762	0.072	0.3	29.2	O K
2880 min Winter	19.760	0.070	0.3	28.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	23.6	242
360 min Winter	11.522	0.0	26.4	356
480 min Winter	9.408	0.0	28.4	470
600 min Winter	8.035	0.0	30.0	580
720 min Winter	7.061	0.0	31.2	688
960 min Winter	5.757	0.0	33.0	806
1440 min Winter	4.315	0.0	34.7	1098
2160 min Winter	3.233	0.0	48.0	1560
2880 min Winter	2.632	0.0	51.6	1996

Cascade Summary of Results for 1. Block C1 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	19.755	0.065	0.3	26.3	O K
5760 min Winter	19.749	0.059	0.3	24.0	O K
7200 min Winter	19.744	0.054	0.3	21.8	O K
8640 min Winter	19.739	0.049	0.2	20.0	O K
10080 min Winter	19.736	0.046	0.2	18.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	55.7	2860
5760 min Winter	1.598	0.0	64.2	3688
7200 min Winter	1.360	0.0	68.3	4472
8640 min Winter	1.192	0.0	71.8	5272
10080 min Winter	1.066	0.0	74.5	6048

Cascade Rainfall Details for 1. Block C1 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.042

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.042

Cascade Model Details for 1. Block C1 (Green).SRCX

Storage is Online Cover Level (m) 21.200

Tank or Pond Structure

Invert Level (m) 19.690

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	404.0	0.114	404.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 19.690

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1500	0.035	0.2000	0.051	0.2500	0.071	0.3000	0.085	0.3200
0.033	0.1800	0.042	0.2200	0.061	0.2700	0.077	0.3100		

Cascade Summary of Results for 2. Block C2 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	19.117	0.022	0.1	9.3	O K
30 min Summer	19.125	0.030	0.2	12.8	O K
60 min Summer	19.133	0.038	0.2	16.4	O K
120 min Summer	19.142	0.047	0.2	20.2	O K
180 min Summer	19.148	0.053	0.3	22.5	O K
240 min Summer	19.151	0.056	0.3	24.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	7.0	23
30 min Summer	60.337	0.0	9.6	38
60 min Summer	39.120	0.0	15.6	68
120 min Summer	24.669	0.0	19.6	128
180 min Summer	18.673	0.0	22.1	186
240 min Summer	15.302	0.0	24.0	246

Cascade Summary of Results for 2. Block C2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	19.156	0.061	0.3	26.3	O K
480 min Summer	19.159	0.064	0.3	27.6	O K
600 min Summer	19.161	0.066	0.3	28.4	O K
720 min Summer	19.163	0.068	0.3	29.0	O K
960 min Summer	19.165	0.070	0.3	29.8	O K
1440 min Summer	19.167	0.072	0.3	30.7	O K
2160 min Summer	19.168	0.073	0.3	31.1	O K
2880 min Summer	19.167	0.072	0.3	30.9	O K
4320 min Summer	19.164	0.069	0.3	29.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	26.7	366
480 min Summer	9.408	0.0	28.7	484
600 min Summer	8.035	0.0	30.3	604
720 min Summer	7.061	0.0	31.5	702
960 min Summer	5.757	0.0	33.2	804
1440 min Summer	4.315	0.0	34.8	1058
2160 min Summer	3.233	0.0	49.0	1472
2880 min Summer	2.632	0.0	52.6	1880
4320 min Summer	1.966	0.0	56.4	2724

Cascade Summary of Results for 2. Block C2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	19.161	0.066	0.3	28.1	O K
7200 min Summer	19.157	0.062	0.3	26.5	O K
8640 min Summer	19.154	0.059	0.3	25.0	O K
10080 min Summer	19.150	0.055	0.3	23.7	O K
15 min Winter	19.117	0.022	0.1	9.3	O K
30 min Winter	19.125	0.030	0.2	12.8	O K
60 min Winter	19.133	0.038	0.2	16.4	O K
120 min Winter	19.142	0.047	0.2	20.2	O K
180 min Winter	19.148	0.053	0.3	22.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	65.7	3512
7200 min Summer	1.360	0.0	70.0	4320
8640 min Summer	1.192	0.0	73.5	5024
10080 min Summer	1.066	0.0	76.0	5848
15 min Winter	87.356	0.0	7.0	23
30 min Winter	60.337	0.0	9.6	37
60 min Winter	39.120	0.0	15.6	66
120 min Winter	24.669	0.0	19.6	126
180 min Winter	18.673	0.0	22.1	184

Cascade Summary of Results for 2. Block C2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	19.151	0.056	0.3	24.2	O K
360 min Winter	19.156	0.061	0.3	26.3	O K
480 min Winter	19.160	0.065	0.3	27.7	O K
600 min Winter	19.162	0.067	0.3	28.6	O K
720 min Winter	19.163	0.068	0.3	29.2	O K
960 min Winter	19.165	0.070	0.3	29.8	O K
1440 min Winter	19.166	0.071	0.3	30.5	O K
2160 min Winter	19.166	0.071	0.3	30.4	O K
2880 min Winter	19.164	0.069	0.3	29.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	24.0	242
360 min Winter	11.522	0.0	26.7	358
480 min Winter	9.408	0.0	28.7	470
600 min Winter	8.035	0.0	30.3	582
720 min Winter	7.061	0.0	31.5	690
960 min Winter	5.757	0.0	33.3	890
1440 min Winter	4.315	0.0	34.8	1112
2160 min Winter	3.233	0.0	49.0	1564
2880 min Winter	2.632	0.0	52.6	2020

Cascade Summary of Results for 2. Block C2 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	19.159	0.064	0.3	27.5	O K
5760 min Winter	19.154	0.059	0.3	25.2	O K
7200 min Winter	19.149	0.054	0.3	23.1	O K
8640 min Winter	19.144	0.049	0.2	21.1	O K
10080 min Winter	19.140	0.045	0.2	19.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	56.5	2896
5760 min Winter	1.598	0.0	65.7	3696
7200 min Winter	1.360	0.0	70.0	4536
8640 min Winter	1.192	0.0	73.5	5280
10080 min Winter	1.066	0.0	76.1	6056

Cascade Rainfall Details for 2. Block C2 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.043

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.043

Cascade Model Details for 2. Block C2 (Green).SRCX

Storage is Online Cover Level (m) 21.200

Tank or Pond Structure

Invert Level (m) 19.095

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	428.0	0.114	428.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 19.095

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1500	0.034	0.2000	0.049	0.2400	0.070	0.2900	0.085	0.3200
0.029	0.1800	0.041	0.2200	0.059	0.2700	0.076	0.3000	0.087	0.3200

Cascade Summary of Results for 3. Block C3 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.281	0.023	0.1	5.4	O K
30 min Summer	18.290	0.032	0.1	7.4	O K
60 min Summer	18.299	0.041	0.1	9.5	O K
120 min Summer	18.308	0.050	0.2	11.7	O K
180 min Summer	18.313	0.055	0.2	13.0	O K
240 min Summer	18.317	0.059	0.2	13.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	4.4	23
30 min Summer	60.337	0.0	6.1	38
60 min Summer	39.120	0.0	9.4	68
120 min Summer	24.669	0.0	11.8	126
180 min Summer	18.673	0.0	13.3	186
240 min Summer	15.302	0.0	14.5	246

Cascade Summary of Results for 3. Block C3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	18.322	0.064	0.2	15.0	O K
480 min Summer	18.325	0.067	0.2	15.7	O K
600 min Summer	18.327	0.069	0.2	16.1	O K
720 min Summer	18.328	0.070	0.2	16.3	O K
960 min Summer	18.330	0.072	0.2	16.7	O K
1440 min Summer	18.331	0.073	0.2	17.2	O K
2160 min Summer	18.332	0.074	0.2	17.2	O K
2880 min Summer	18.331	0.073	0.2	17.0	O K
4320 min Summer	18.327	0.069	0.2	16.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	16.2	366
480 min Summer	9.408	0.0	17.5	484
600 min Summer	8.035	0.0	18.5	590
720 min Summer	7.061	0.0	19.3	634
960 min Summer	5.757	0.0	20.5	762
1440 min Summer	4.315	0.0	21.8	1016
2160 min Summer	3.233	0.0	28.8	1432
2880 min Summer	2.632	0.0	31.1	1848
4320 min Summer	1.966	0.0	33.9	2680

Cascade Summary of Results for 3. Block C3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	18.323	0.065	0.2	15.1	O K
7200 min Summer	18.318	0.060	0.2	14.1	O K
8640 min Summer	18.314	0.056	0.2	13.2	O K
10080 min Summer	18.311	0.053	0.2	12.3	O K
15 min Winter	18.281	0.023	0.1	5.4	O K
30 min Winter	18.290	0.032	0.1	7.4	O K
60 min Winter	18.299	0.041	0.1	9.5	O K
120 min Winter	18.308	0.050	0.2	11.7	O K
180 min Winter	18.313	0.055	0.2	13.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	38.2	3464
7200 min Summer	1.360	0.0	40.7	4248
8640 min Summer	1.192	0.0	42.8	5016
10080 min Summer	1.066	0.0	44.5	5752
15 min Winter	87.356	0.0	4.4	23
30 min Winter	60.337	0.0	6.1	37
60 min Winter	39.120	0.0	9.4	66
120 min Winter	24.669	0.0	11.8	124
180 min Winter	18.673	0.0	13.3	184

Cascade Summary of Results for 3. Block C3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	18.317	0.059	0.2	13.9	O K
360 min Winter	18.322	0.064	0.2	15.1	O K
480 min Winter	18.325	0.067	0.2	15.7	O K
600 min Winter	18.327	0.069	0.2	16.2	O K
720 min Winter	18.328	0.070	0.2	16.4	O K
960 min Winter	18.329	0.071	0.2	16.7	O K
1440 min Winter	18.331	0.073	0.2	17.0	O K
2160 min Winter	18.329	0.071	0.2	16.7	O K
2880 min Winter	18.327	0.069	0.2	16.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	14.5	242
360 min Winter	11.522	0.0	16.2	356
480 min Winter	9.408	0.0	17.5	468
600 min Winter	8.035	0.0	18.5	576
720 min Winter	7.061	0.0	19.3	682
960 min Winter	5.757	0.0	20.5	774
1440 min Winter	4.315	0.0	21.8	1084
2160 min Winter	3.233	0.0	28.8	1540
2880 min Winter	2.632	0.0	31.1	1992

Cascade Summary of Results for 3. Block C3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	18.321	0.063	0.2	14.7	O K
5760 min Winter	18.314	0.056	0.2	13.2	O K
7200 min Winter	18.309	0.051	0.2	11.9	O K
8640 min Winter	18.304	0.046	0.1	10.8	O K
10080 min Winter	18.300	0.042	0.1	9.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	33.9	2856
5760 min Winter	1.598	0.0	38.2	3640
7200 min Winter	1.360	0.0	40.7	4400
8640 min Winter	1.192	0.0	42.8	5192
10080 min Winter	1.066	0.0	44.5	5960

Cascade Rainfall Details for 3. Block C3 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.025

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.025

Cascade Model Details for 3. Block C3 (Green).SRCX

Storage is Online Cover Level (m) 21.200

Tank or Pond Structure

Invert Level (m) 18.258

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	234.0	0.114	234.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 18.258

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.035	0.1300	0.051	0.1600	0.071	0.1900	0.084	0.2000
0.030	0.1200	0.042	0.1400	0.061	0.1700	0.077	0.2000		

Cascade Summary of Results for 4. Block C4 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.273	0.022	0.1	2.1	O K
30 min Summer	18.280	0.029	0.1	2.9	O K
60 min Summer	18.288	0.037	0.1	3.6	O K
120 min Summer	18.295	0.044	0.1	4.3	O K
180 min Summer	18.298	0.047	0.2	4.6	O K
240 min Summer	18.300	0.049	0.2	4.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	2.1	23
30 min Summer	60.337	0.0	3.0	37
60 min Summer	39.120	0.0	3.9	66
120 min Summer	24.669	0.0	4.9	126
180 min Summer	18.673	0.0	5.6	184
240 min Summer	15.302	0.0	6.1	226

Cascade Summary of Results for 4. Block C4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	18.302	0.051	0.2	5.0	O K
480 min Summer	18.303	0.052	0.2	5.1	O K
600 min Summer	18.304	0.053	0.2	5.2	O K
720 min Summer	18.304	0.053	0.2	5.2	O K
960 min Summer	18.304	0.053	0.2	5.2	O K
1440 min Summer	18.302	0.051	0.2	5.0	O K
2160 min Summer	18.298	0.047	0.1	4.6	O K
2880 min Summer	18.294	0.043	0.1	4.2	O K
4320 min Summer	18.287	0.036	0.1	3.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	6.9	286
480 min Summer	9.408	0.0	7.5	352
600 min Summer	8.035	0.0	8.0	420
720 min Summer	7.061	0.0	8.4	488
960 min Summer	5.757	0.0	9.2	628
1440 min Summer	4.315	0.0	10.3	898
2160 min Summer	3.233	0.0	11.6	1300
2880 min Summer	2.632	0.0	12.6	1676
4320 min Summer	1.966	0.0	14.1	2428

Cascade Summary of Results for 4. Block C4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	18.282	0.031	0.1	3.0	O K
7200 min Summer	18.278	0.027	0.1	2.6	O K
8640 min Summer	18.275	0.024	0.1	2.4	O K
10080 min Summer	18.273	0.022	0.1	2.1	O K
15 min Winter	18.273	0.022	0.1	2.1	O K
30 min Winter	18.281	0.030	0.1	2.9	O K
60 min Winter	18.288	0.037	0.1	3.6	O K
120 min Winter	18.295	0.044	0.1	4.3	O K
180 min Winter	18.299	0.048	0.2	4.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	15.3	3168
7200 min Summer	1.360	0.0	16.3	3824
8640 min Summer	1.192	0.0	17.1	4576
10080 min Summer	1.066	0.0	17.9	5248
15 min Winter	87.356	0.0	2.1	22
30 min Winter	60.337	0.0	3.0	37
60 min Winter	39.120	0.0	3.9	66
120 min Winter	24.669	0.0	4.9	122
180 min Winter	18.673	0.0	5.6	178

Cascade Summary of Results for 4. Block C4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	18.300	0.049	0.2	4.8	O K
360 min Winter	18.302	0.051	0.2	5.0	O K
480 min Winter	18.303	0.052	0.2	5.1	O K
600 min Winter	18.303	0.052	0.2	5.1	O K
720 min Winter	18.303	0.052	0.2	5.1	O K
960 min Winter	18.301	0.050	0.2	4.9	O K
1440 min Winter	18.297	0.046	0.1	4.6	O K
2160 min Winter	18.292	0.041	0.1	4.0	O K
2880 min Winter	18.287	0.036	0.1	3.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	6.1	232
360 min Winter	11.522	0.0	6.9	292
480 min Winter	9.408	0.0	7.5	370
600 min Winter	8.035	0.0	8.0	446
720 min Winter	7.061	0.0	8.4	524
960 min Winter	5.757	0.0	9.2	670
1440 min Winter	4.315	0.0	10.3	956
2160 min Winter	3.233	0.0	11.6	1364
2880 min Winter	2.632	0.0	12.6	1764

Cascade Summary of Results for 4. Block C4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	18.278	0.027	0.1	2.7	O K
5760 min Winter	18.273	0.022	0.1	2.2	O K
7200 min Winter	18.271	0.020	0.1	1.9	O K
8640 min Winter	18.268	0.017	0.1	1.7	O K
10080 min Winter	18.267	0.016	0.1	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	14.1	2468
5760 min Winter	1.598	0.0	15.3	3176
7200 min Winter	1.360	0.0	16.3	3888
8640 min Winter	1.192	0.0	17.1	4664
10080 min Winter	1.066	0.0	17.9	5344

Cascade Rainfall Details for 4. Block C4 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.010

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.010

Cascade Model Details for 4. Block C4 (Green).SRCX

Storage is Online Cover Level (m) 21.200

Tank or Pond Structure

Invert Level (m) 18.251

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	98.0	0.114	98.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 18.251

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.047	0.1500	0.060	0.1700
0.029	0.1200	0.040	0.1400	0.055	0.1600	0.061	0.1700

Cascade Summary of Results for 5. Block C5 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.481	0.021	0.1	6.3	O K
30 min Summer	17.489	0.029	0.1	8.6	O K
60 min Summer	17.498	0.038	0.2	11.0	O K
120 min Summer	17.506	0.046	0.2	13.5	O K
180 min Summer	17.511	0.051	0.2	15.0	O K
240 min Summer	17.515	0.055	0.2	16.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	5.0	23
30 min Summer	60.337	0.0	6.9	38
60 min Summer	39.120	0.0	10.8	68
120 min Summer	24.669	0.0	13.6	126
180 min Summer	18.673	0.0	15.4	186
240 min Summer	15.302	0.0	16.7	246

Cascade Summary of Results for 5. Block C5 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	17.519	0.059	0.2	17.4	O K
480 min Summer	17.522	0.062	0.2	18.1	O K
600 min Summer	17.523	0.063	0.2	18.6	O K
720 min Summer	17.524	0.064	0.2	18.9	O K
960 min Summer	17.526	0.066	0.2	19.4	O K
1440 min Summer	17.528	0.068	0.2	19.8	O K
2160 min Summer	17.528	0.068	0.2	19.9	O K
2880 min Summer	17.527	0.067	0.2	19.6	O K
4320 min Summer	17.523	0.063	0.2	18.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	18.7	366
480 min Summer	9.408	0.0	20.2	484
600 min Summer	8.035	0.0	21.4	578
720 min Summer	7.061	0.0	22.3	628
960 min Summer	5.757	0.0	23.8	754
1440 min Summer	4.315	0.0	25.4	1014
2160 min Summer	3.233	0.0	33.4	1432
2880 min Summer	2.632	0.0	36.0	1848
4320 min Summer	1.966	0.0	39.3	2644

Cascade Summary of Results for 5. Block C5 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	17.519	0.059	0.2	17.4	O K
7200 min Summer	17.515	0.055	0.2	16.3	O K
8640 min Summer	17.512	0.052	0.2	15.2	O K
10080 min Summer	17.509	0.049	0.2	14.3	O K
15 min Winter	17.481	0.021	0.1	6.3	O K
30 min Winter	17.489	0.029	0.1	8.6	O K
60 min Winter	17.498	0.038	0.2	11.0	O K
120 min Winter	17.506	0.046	0.2	13.6	O K
180 min Winter	17.511	0.051	0.2	15.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	44.3	3456
7200 min Summer	1.360	0.0	47.2	4248
8640 min Summer	1.192	0.0	49.6	5008
10080 min Summer	1.066	0.0	51.5	5744
15 min Winter	87.356	0.0	5.0	23
30 min Winter	60.337	0.0	6.9	37
60 min Winter	39.120	0.0	10.8	66
120 min Winter	24.669	0.0	13.6	124
180 min Winter	18.673	0.0	15.4	184

Cascade Summary of Results for 5. Block C5 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	17.515	0.055	0.2	16.1	O K
360 min Winter	17.519	0.059	0.2	17.4	O K
480 min Winter	17.522	0.062	0.2	18.2	O K
600 min Winter	17.524	0.064	0.2	18.7	O K
720 min Winter	17.525	0.065	0.2	19.0	O K
960 min Winter	17.526	0.066	0.2	19.3	O K
1440 min Winter	17.527	0.067	0.2	19.6	O K
2160 min Winter	17.526	0.066	0.2	19.3	O K
2880 min Winter	17.523	0.063	0.2	18.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	16.7	242
360 min Winter	11.522	0.0	18.7	356
480 min Winter	9.408	0.0	20.2	468
600 min Winter	8.035	0.0	21.4	576
720 min Winter	7.061	0.0	22.3	678
960 min Winter	5.757	0.0	23.8	772
1440 min Winter	4.315	0.0	25.4	1074
2160 min Winter	3.233	0.0	33.4	1536
2880 min Winter	2.632	0.0	36.0	1968

Cascade Summary of Results for 5. Block C5 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	17.518	0.058	0.2	16.9	O K
5760 min Winter	17.512	0.052	0.2	15.2	O K
7200 min Winter	17.507	0.047	0.2	13.8	O K
8640 min Winter	17.502	0.042	0.2	12.4	O K
10080 min Winter	17.498	0.038	0.2	11.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	39.3	2816
5760 min Winter	1.598	0.0	44.3	3632
7200 min Winter	1.360	0.0	47.2	4400
8640 min Winter	1.192	0.0	49.6	5192
10080 min Winter	1.066	0.0	51.6	5952

Cascade Rainfall Details for 5. Block C5 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.029

Time From: (mins)	To: (mins)	Area (ha)	Time From: (mins)	To: (mins)	Area (ha)
0	4	0.000	4	8	0.029

Time Area Diagram

Total Area (ha) 0.000

Time From: (mins)	To: (mins)	Area (ha)
0	4	0.000

Cascade Model Details for 5. Block C5 (Green).SRCX

Storage is Online Cover Level (m) 21.200

Tank or Pond Structure

Invert Level (m) 17.460

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	293.0	0.114	293.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 17.460

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1200	0.034	0.1600	0.049	0.1900	0.068	0.2300	0.080	0.2500
0.029	0.1400	0.041	0.1700	0.058	0.2100	0.074	0.2400		

Cascade Summary of Results for 7. Block C7 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	12. Att Tank - Catchment 2.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	16.787	0.021	0.1	1.7	O K
30 min Summer	16.795	0.029	0.1	2.3	O K
60 min Summer	16.802	0.036	0.1	2.9	O K
120 min Summer	16.808	0.042	0.1	3.3	O K
180 min Summer	16.811	0.045	0.2	3.5	O K
240 min Summer	16.812	0.046	0.2	3.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	1.7	22
30 min Summer	60.337	0.0	2.4	37
60 min Summer	39.120	0.0	3.1	66
120 min Summer	24.669	0.0	3.9	124
180 min Summer	18.673	0.0	4.4	170
240 min Summer	15.302	0.0	4.9	200

Cascade Summary of Results for 7. Block C7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	16.814	0.048	0.2	3.8	O K
480 min Summer	16.815	0.049	0.2	3.8	O K
600 min Summer	16.815	0.049	0.2	3.9	O K
720 min Summer	16.815	0.049	0.2	3.8	O K
960 min Summer	16.813	0.047	0.2	3.8	O K
1440 min Summer	16.810	0.044	0.2	3.5	O K
2160 min Summer	16.806	0.040	0.1	3.2	O K
2880 min Summer	16.802	0.036	0.1	2.9	O K
4320 min Summer	16.795	0.029	0.1	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	5.5	264
480 min Summer	9.408	0.0	6.0	332
600 min Summer	8.035	0.0	6.4	402
720 min Summer	7.061	0.0	6.7	472
960 min Summer	5.757	0.0	7.3	610
1440 min Summer	4.315	0.0	8.2	870
2160 min Summer	3.233	0.0	9.3	1260
2880 min Summer	2.632	0.0	10.1	1648
4320 min Summer	1.966	0.0	11.3	2344

Cascade Summary of Results for 7. Block C7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	16.791	0.025	0.1	2.0	O K
7200 min Summer	16.788	0.022	0.1	1.7	O K
8640 min Summer	16.786	0.020	0.1	1.6	O K
10080 min Summer	16.784	0.018	0.1	1.4	O K
15 min Winter	16.787	0.021	0.1	1.7	O K
30 min Winter	16.795	0.029	0.1	2.3	O K
60 min Winter	16.802	0.036	0.1	2.9	O K
120 min Winter	16.808	0.042	0.1	3.4	O K
180 min Winter	16.811	0.045	0.2	3.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	12.2	3064
7200 min Summer	1.360	0.0	13.0	3816
8640 min Summer	1.192	0.0	13.7	4496
10080 min Summer	1.066	0.0	14.3	5240
15 min Winter	87.356	0.0	1.7	22
30 min Winter	60.337	0.0	2.4	36
60 min Winter	39.120	0.0	3.1	66
120 min Winter	24.669	0.0	3.9	122
180 min Winter	18.673	0.0	4.4	176

Cascade Summary of Results for 7. Block C7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	16.812	0.046	0.2	3.6	O K
360 min Winter	16.814	0.048	0.2	3.8	O K
480 min Winter	16.814	0.048	0.2	3.8	O K
600 min Winter	16.813	0.047	0.2	3.7	O K
720 min Winter	16.812	0.046	0.2	3.7	O K
960 min Winter	16.810	0.044	0.2	3.5	O K
1440 min Winter	16.806	0.040	0.1	3.1	O K
2160 min Winter	16.800	0.034	0.1	2.7	O K
2880 min Winter	16.794	0.028	0.1	2.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	4.9	206
360 min Winter	11.522	0.0	5.5	278
480 min Winter	9.408	0.0	6.0	356
600 min Winter	8.035	0.0	6.4	432
720 min Winter	7.061	0.0	6.7	504
960 min Winter	5.757	0.0	7.3	648
1440 min Winter	4.315	0.0	8.2	926
2160 min Winter	3.233	0.0	9.3	1328
2880 min Winter	2.632	0.0	10.1	1676

Cascade Summary of Results for 7. Block C7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	16.788	0.022	0.1	1.7	O K
5760 min Winter	16.784	0.018	0.1	1.4	O K
7200 min Winter	16.782	0.016	0.1	1.3	O K
8640 min Winter	16.780	0.014	0.1	1.1	O K
10080 min Winter	16.779	0.013	0.1	1.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	11.3	2384
5760 min Winter	1.598	0.0	12.2	3120
7200 min Winter	1.360	0.0	13.0	3888
8640 min Winter	1.192	0.0	13.7	4576
10080 min Winter	1.066	0.0	14.3	5336

Cascade Rainfall Details for 7. Block C7 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.008

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.000	4	8	0.008

Time Area Diagram

Total Area (ha) 0.000

Time From:	(mins) To:	Area (ha)
0	4	0.000

Cascade Model Details for 7. Block C7 (Green).SRCX

Storage is Online Cover Level (m) 21.200

Tank or Pond Structure

Invert Level (m) 16.766

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	79.0	0.114	79.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 16.766

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.033	0.1200	0.044	0.1500	0.056	0.1700
0.029	0.1200	0.040	0.1400	0.053	0.1600		

Cascade Summary of Results for 15. Pond 2 - Catchment 3.SRCX

Upstream Structures	Outflow To	Overflow To
12. Att Tank - Catchment 2.SRCX 1. Block C1 (Green).SRCX 2. Block C2 (Green).SRCX 3. Block C3 (Green).SRCX 4. Block C4 (Green).SRCX 5. Block C5 (Green).SRCX 6. Podium C (Blue).SRCX 7. Block C7 (Green).SRCX 8. Block B3 (Blue).SRCX 9. Block B4 (Green).SRCX 10. Block A2 (Green).SRCX 11. Podium A (Blue).SRCX 13. Block A7 (Green).SRCX 14. Block A6 (Blue).SRCX	20. Att Tank - Catchment 4.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)

Cascade Summary of Results for 15. Pond 2 - Catchment 3.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.430	0.360	4.1	33.5	O K
30 min Summer	17.510	0.440	4.2	43.9	O K
60 min Summer	17.592	0.522	4.3	55.6	O K
120 min Summer	17.673	0.603	4.4	68.6	O K
180 min Summer	17.723	0.653	4.5	77.0	O K
240 min Summer	17.761	0.691	4.5	83.6	O K
360 min Summer	17.816	0.746	4.6	93.6	O K
480 min Summer	17.857	0.787	4.7	101.1	O K
600 min Summer	17.889	0.819	4.7	107.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	186.2	217
30 min Summer	60.337	0.0	256.6	408
60 min Summer	39.120	0.0	373.7	66
120 min Summer	24.669	0.0	469.7	126
180 min Summer	18.673	0.0	531.7	186
240 min Summer	15.302	0.0	579.2	248
360 min Summer	11.522	0.0	650.2	368
480 min Summer	9.408	0.0	703.6	488
600 min Summer	8.035	0.0	746.5	706

Cascade Summary of Results for 15. Pond 2 - Catchment 3.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
720 min Summer	17.917	0.847	4.7	112.9	O K
960 min Summer	17.963	0.893	4.8	122.3	O K
1440 min Summer	18.029	0.959	4.9	136.3	O K
2160 min Summer	18.090	1.020	4.9	150.0	O K
2880 min Summer	18.115	1.045	5.0	155.6	Flood Risk
4320 min Summer	18.094	1.024	4.9	150.8	O K
5760 min Summer	18.057	0.987	4.9	142.5	O K
7200 min Summer	18.014	0.944	4.8	133.0	O K
8640 min Summer	17.966	0.896	4.8	123.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	7.061	0.0	756.8	896
960 min Summer	5.757	0.0	757.0	1190
1440 min Summer	4.315	0.0	740.7	1644
2160 min Summer	3.233	0.0	1142.7	2196
2880 min Summer	2.632	0.0	1233.3	2884
4320 min Summer	1.966	0.0	1325.0	3800
5760 min Summer	1.598	0.0	1521.0	4504
7200 min Summer	1.360	0.0	1617.9	5192
8640 min Summer	1.192	0.0	1700.2	5912

Cascade Summary of Results for 15. Pond 2 - Catchment 3.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	17.916	0.846	4.7	112.7	O K
15 min Winter	17.430	0.360	4.1	33.5	O K
30 min Winter	17.511	0.441	4.2	44.0	O K
60 min Winter	17.594	0.524	4.3	56.0	O K
120 min Winter	17.677	0.607	4.4	69.2	O K
180 min Winter	17.727	0.657	4.5	77.7	O K
240 min Winter	17.765	0.695	4.5	84.2	O K
360 min Winter	17.820	0.750	4.6	94.2	O K
480 min Winter	17.860	0.790	4.7	101.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.066	0.0	1766.4	6648
15 min Winter	87.356	0.0	186.2	216
30 min Winter	60.337	0.0	256.5	38
60 min Winter	39.120	0.0	373.7	66
120 min Winter	24.669	0.0	469.9	124
180 min Winter	18.673	0.0	531.6	184
240 min Winter	15.302	0.0	579.1	244
360 min Winter	11.522	0.0	650.2	364
480 min Winter	9.408	0.0	703.7	486

Cascade Summary of Results for 15. Pond 2 - Catchment 3.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	17.893	0.823	4.7	108.1	O K
720 min Winter	17.921	0.851	4.7	113.7	O K
960 min Winter	17.966	0.896	4.8	123.0	O K
1440 min Winter	18.030	0.960	4.9	136.5	O K
2160 min Winter	18.084	1.014	4.9	148.6	O K
2880 min Winter	18.102	1.032	4.9	152.7	Flood Risk
4320 min Winter	18.060	0.990	4.9	143.2	O K
5760 min Winter	17.992	0.922	4.8	128.5	O K
7200 min Winter	17.914	0.844	4.7	112.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	8.035	0.0	746.6	698
720 min Winter	7.061	0.0	757.1	886
960 min Winter	5.757	0.0	757.7	1180
1440 min Winter	4.315	0.0	742.5	1630
2160 min Winter	3.233	0.0	1142.6	2180
2880 min Winter	2.632	0.0	1233.5	2840
4320 min Winter	1.966	0.0	1333.9	3884
5760 min Winter	1.598	0.0	1521.6	4504
7200 min Winter	1.360	0.0	1617.6	5256

Cascade Summary of Results for 15. Pond 2 - Catchment 3.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
8640 min Winter	17.833	0.763	4.6	96.6	O K
10080 min Winter	17.850	0.780	4.6	99.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Winter	1.192	0.0	1700.6	5880
10080 min Winter	1.066	0.0	1767.2	6176

Cascade Rainfall Details for 15. Pond 2 - Catchment 3.SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.152

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.080	4	8	0.072

Cascade Model Details for 15. Pond 2 - Catchment 3.SRCX

Storage is Online Cover Level (m) 18.400

Tank or Pond Structure

Invert Level (m) 17.070

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	67.1	0.550	157.3	1.300	275.8

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0091-4500-1655-4500	Sump Available	Yes
Design Head (m)	1.655	Diameter (mm)	91
Design Flow (l/s)	4.5	Invert Level (m)	16.076
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.655	4.5	Kick-Flo®	0.809	3.2
Flush-Flo™	0.397	4.0	Mean Flow over Head Range	-	3.7

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

Hydro-Brake® Optimum Outflow Control

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.600	3.9	1.600	4.4	2.600	5.5	5.000	7.5	7.500	9.1
0.200	3.7	0.800	3.3	1.800	4.7	3.000	5.9	5.500	7.9	8.000	9.4
0.300	4.0	1.000	3.6	2.000	4.9	3.500	6.4	6.000	8.2	8.500	9.7
0.400	4.0	1.200	3.9	2.200	5.1	4.000	6.8	6.500	8.5	9.000	10.0
0.500	4.0	1.400	4.2	2.400	5.3	4.500	7.2	7.000	8.9	9.500	10.2

Cascade Summary of Results for 14. Block A6 (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	15. Pond 2 - Catchment 3.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	16.375	0.021	0.1	3.4	O K
30 min Summer	16.383	0.029	0.1	4.7	O K
60 min Summer	16.391	0.037	0.1	6.0	O K
120 min Summer	16.400	0.046	0.1	7.3	O K
180 min Summer	16.404	0.050	0.2	8.0	O K
240 min Summer	16.407	0.053	0.2	8.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	3.2	23
30 min Summer	60.337	0.0	4.4	37
60 min Summer	39.120	0.0	6.2	68
120 min Summer	24.669	0.0	7.8	126
180 min Summer	18.673	0.0	8.9	186
240 min Summer	15.302	0.0	9.7	246

Cascade Summary of Results for 14. Block A6 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	16.410	0.056	0.2	9.0	O K
480 min Summer	16.412	0.058	0.2	9.2	O K
600 min Summer	16.413	0.059	0.2	9.4	O K
720 min Summer	16.414	0.060	0.2	9.6	O K
960 min Summer	16.415	0.061	0.2	9.7	O K
1440 min Summer	16.415	0.061	0.2	9.8	O K
2160 min Summer	16.413	0.059	0.2	9.5	O K
2880 min Summer	16.411	0.057	0.2	9.1	O K
4320 min Summer	16.405	0.051	0.2	8.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	10.9	364
480 min Summer	9.408	0.0	11.8	422
600 min Summer	8.035	0.0	12.6	482
720 min Summer	7.061	0.0	13.3	546
960 min Summer	5.757	0.0	14.3	678
1440 min Summer	4.315	0.0	15.8	956
2160 min Summer	3.233	0.0	18.5	1368
2880 min Summer	2.632	0.0	20.1	1768
4320 min Summer	1.966	0.0	22.5	2556

Cascade Summary of Results for 14. Block A6 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	16.400	0.046	0.1	7.4	O K
7200 min Summer	16.396	0.042	0.1	6.7	O K
8640 min Summer	16.392	0.038	0.1	6.1	O K
10080 min Summer	16.390	0.036	0.1	5.7	O K
15 min Winter	16.375	0.021	0.1	3.4	O K
30 min Winter	16.383	0.029	0.1	4.7	O K
60 min Winter	16.391	0.037	0.1	6.0	O K
120 min Winter	16.400	0.046	0.1	7.3	O K
180 min Winter	16.404	0.050	0.2	8.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	24.5	3296
7200 min Summer	1.360	0.0	26.0	4040
8640 min Summer	1.192	0.0	27.4	4760
10080 min Summer	1.066	0.0	28.6	5544
15 min Winter	87.356	0.0	3.2	23
30 min Winter	60.337	0.0	4.4	37
60 min Winter	39.120	0.0	6.2	66
120 min Winter	24.669	0.0	7.8	124
180 min Winter	18.673	0.0	8.9	182

Cascade Summary of Results for 14. Block A6 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	16.407	0.053	0.2	8.5	O K
360 min Winter	16.410	0.056	0.2	9.0	O K
480 min Winter	16.412	0.058	0.2	9.3	O K
600 min Winter	16.413	0.059	0.2	9.4	O K
720 min Winter	16.413	0.059	0.2	9.5	O K
960 min Winter	16.414	0.060	0.2	9.6	O K
1440 min Winter	16.413	0.059	0.2	9.4	O K
2160 min Winter	16.410	0.056	0.2	8.9	O K
2880 min Winter	16.405	0.051	0.2	8.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	9.7	240
360 min Winter	11.522	0.0	10.9	350
480 min Winter	9.408	0.0	11.8	456
600 min Winter	8.035	0.0	12.6	494
720 min Winter	7.061	0.0	13.3	566
960 min Winter	5.757	0.0	14.3	718
1440 min Winter	4.315	0.0	15.8	1028
2160 min Winter	3.233	0.0	18.5	1472
2880 min Winter	2.632	0.0	20.1	1880

Cascade Summary of Results for 14. Block A6 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	16.398	0.044	0.1	7.0	O K
5760 min Winter	16.392	0.038	0.1	6.0	O K
7200 min Winter	16.387	0.033	0.1	5.3	O K
8640 min Winter	16.383	0.029	0.1	4.6	O K
10080 min Winter	16.379	0.025	0.1	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	22.5	2684
5760 min Winter	1.598	0.0	24.5	3456
7200 min Winter	1.360	0.0	26.0	4248
8640 min Winter	1.192	0.0	27.4	4936
10080 min Winter	1.066	0.0	28.6	5648

Cascade Rainfall Details for 14. Block A6 (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.016

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.016

Cascade Model Details for 14. Block A6 (Blue).SRCX

Storage is Online Cover Level (m) 18.600

Tank or Pond Structure

Invert Level (m) 16.354

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	160.0	0.097	160.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 16.354

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.048	0.1500	0.065	0.1800	0.071	0.1900
0.029	0.1100	0.040	0.1400	0.057	0.1600	0.069	0.1800		

Cascade Summary of Results for 13. Block A7 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	15. Pond 2 - Catchment 3.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	16.578	0.021	0.1	4.5	O K
30 min Summer	16.586	0.029	0.1	6.2	O K
60 min Summer	16.595	0.038	0.1	7.9	O K
120 min Summer	16.603	0.046	0.1	9.7	O K
180 min Summer	16.608	0.051	0.2	10.8	O K
240 min Summer	16.611	0.054	0.2	11.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	3.9	23
30 min Summer	60.337	0.0	5.3	38
60 min Summer	39.120	0.0	8.0	68
120 min Summer	24.669	0.0	10.0	126
180 min Summer	18.673	0.0	11.4	186
240 min Summer	15.302	0.0	12.4	246

Cascade Summary of Results for 13. Block A7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	16.616	0.059	0.2	12.4	O K
480 min Summer	16.618	0.061	0.2	12.8	O K
600 min Summer	16.619	0.062	0.2	13.1	O K
720 min Summer	16.620	0.063	0.2	13.3	O K
960 min Summer	16.622	0.065	0.2	13.6	O K
1440 min Summer	16.623	0.066	0.2	13.9	O K
2160 min Summer	16.623	0.066	0.2	13.9	O K
2880 min Summer	16.621	0.064	0.2	13.5	O K
4320 min Summer	16.617	0.060	0.2	12.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	13.9	364
480 min Summer	9.408	0.0	15.0	484
600 min Summer	8.035	0.0	15.9	540
720 min Summer	7.061	0.0	16.7	602
960 min Summer	5.757	0.0	17.9	726
1440 min Summer	4.315	0.0	19.3	998
2160 min Summer	3.233	0.0	24.3	1412
2880 min Summer	2.632	0.0	26.3	1820
4320 min Summer	1.966	0.0	29.0	2640

Cascade Summary of Results for 13. Block A7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	16.613	0.056	0.2	11.7	O K
7200 min Summer	16.609	0.052	0.2	10.9	O K
8640 min Summer	16.605	0.048	0.1	10.1	O K
10080 min Summer	16.601	0.044	0.1	9.4	O K
15 min Winter	16.578	0.021	0.1	4.5	O K
30 min Winter	16.586	0.029	0.1	6.2	O K
60 min Winter	16.595	0.038	0.1	7.9	O K
120 min Winter	16.603	0.046	0.1	9.8	O K
180 min Winter	16.608	0.051	0.2	10.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	32.1	3408
7200 min Summer	1.360	0.0	34.2	4184
8640 min Summer	1.192	0.0	35.9	4936
10080 min Summer	1.066	0.0	37.4	5656
15 min Winter	87.356	0.0	3.9	23
30 min Winter	60.337	0.0	5.3	37
60 min Winter	39.120	0.0	8.0	66
120 min Winter	24.669	0.0	10.0	124
180 min Winter	18.673	0.0	11.4	182

Cascade Summary of Results for 13. Block A7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	16.612	0.055	0.2	11.5	O K
360 min Winter	16.616	0.059	0.2	12.4	O K
480 min Winter	16.618	0.061	0.2	12.9	O K
600 min Winter	16.620	0.063	0.2	13.2	O K
720 min Winter	16.620	0.063	0.2	13.3	O K
960 min Winter	16.621	0.064	0.2	13.6	O K
1440 min Winter	16.622	0.065	0.2	13.7	O K
2160 min Winter	16.620	0.063	0.2	13.3	O K
2880 min Winter	16.617	0.060	0.2	12.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	12.4	240
360 min Winter	11.522	0.0	13.9	354
480 min Winter	9.408	0.0	15.0	464
600 min Winter	8.035	0.0	15.9	570
720 min Winter	7.061	0.0	16.7	666
960 min Winter	5.757	0.0	17.9	754
1440 min Winter	4.315	0.0	19.3	1060
2160 min Winter	3.233	0.0	24.3	1516
2880 min Winter	2.632	0.0	26.3	1940

Cascade Summary of Results for 13. Block A7 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	16.611	0.054	0.2	11.3	O K
5760 min Winter	16.605	0.048	0.1	10.1	O K
7200 min Winter	16.599	0.042	0.1	8.9	O K
8640 min Winter	16.595	0.038	0.1	8.0	O K
10080 min Winter	16.591	0.034	0.1	7.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	29.0	2772
5760 min Winter	1.598	0.0	32.1	3584
7200 min Winter	1.360	0.0	34.2	4328
8640 min Winter	1.192	0.0	35.9	5104
10080 min Winter	1.066	0.0	37.4	5952

Cascade Rainfall Details for 13. Block A7 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.021

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.021

Cascade Model Details for 13. Block A7 (Green).SRCX

Storage is Online Cover Level (m) 18.600

Tank or Pond Structure

Invert Level (m) 16.557

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	211.0	0.114	211.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 16.557

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.049	0.1500	0.067	0.1800	0.078	0.2000
0.029	0.1200	0.041	0.1400	0.058	0.1700	0.072	0.1900		

STORMTECH Stormwater Management System Design Tool

ver: Jun14

PROJECT REF:	190226 - Attenuation Tank - Catchment 4
LOCATION:	Sandford
DATE:	03.12.25
CREATED BY:	ED

Instructions:
- Fill in blue highlighted cells
- Set width to maximum allowance
- Adjust site parameters and system dimension until volume achieved
- For Rectangular systems only, for irregular shape dig contact Microstrain

SYSTEM PARAMETERS

Required Total Storage	**250**	m^3
Stormtech chamber model	**MC3500**	
Number of Isolator Rows for TSS Removal	1	

SITE PARAMETERS

Maximum Width at Excavation Base	20	m	
Stone Porosity	40%		
Excavation Batter Angle (degrees)	60	°	*Minimum Requirement*
Stone Below Chambers	0.3	m	*0.23*
Stone Above Chambers	0.3	m	*0.30*
Additional Storage. E.g manholes, pipe	0	m^3	

CALCULATED CHAMBER SYSTEM DIMENSIONS

	Calculated	Adopted	
Number of Rows	9		ea
Number of units per Row	5		ea
Number of MC3500 Chambers	45		ea
Number of MC3500 Endcaps	18		ea
System Installed Storage Depth (effective storage depth)	1.745		m
Tank overall installed Width at base	20.04	20.15	m
Tank overall installed Length at Base	12.64	12.75	m
Total Effective System Storage	**292.3**	**295.1**	m^3

STORMTECH SYSTEM DETAIL

StormTech Chamber Model	MC3500	
Unit Width	1.955	m
Unit Length	2.18	m
Unit Height	1.145	m
Min Cover Over System	0.3	m
Max Cover Over Chamber	2.4	m
Internal Storage Vol. (Chamber only)	3.11	m^3

STONE AND EXCAVATION DETAIL

Volume of Dig for System	510	
Area of Dig at Base of System	257	m^2
Area of Dig at Top of System	327	m^2
Void Ratio	58%	
Stone Requirement - tonne	590	tonne

StormTech®
Detention • Retention • Recharge
Subsurface Stormwater Management™

Cascade Summary of Results for 20. Att Tank - Catchment 4.SRCX

Upstream Structures	Outflow To	Overflow To
15. Pond 2 - Catchment 3.SRCX	(None)	(None)
12. Att Tank - Catchment 2.SRCX		
1. Block C1 (Green).SRCX		
2. Block C2 (Green).SRCX		
3. Block C3 (Green).SRCX		
4. Block C4 (Green).SRCX		
5. Block C5 (Green).SRCX		
6. Podium C (Blue).SRCX		
7. Block C7 (Green).SRCX		
8. Block B3 (Blue).SRCX		
9. Block B4 (Green).SRCX		
10. Block A2 (Green).SRCX		
11. Podium A (Blue).SRCX		
13. Block A7 (Green).SRCX		
14. Block A6 (Blue).SRCX		
16. Block A1 (Blue).SRCX		
17. Block A3 (Green).SRCX		
19. Block A4 (Green).SRCX		
9. Att Tank - Catchment 1.SRCX		
3. Pond 1.SRCX		
1. Block D1 (Blue roof).SRCX		
2. Block D2 (Green Roof).SRCX		
4. Podium B (Blue).SRCX		
5. Block B1 (Green).SRCX		
6. Block B2 (Green).SRCX		
7. Block F1 (Blue).SRCX		
8. Block F2 (Green).SRCX		

Cascade Summary of Results for 20. Att Tank - Catchment 4.SRCX

Half Drain Time : 224 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	15.970	0.354	0.0	8.9	8.9	54.6	O K
30 min Summer	16.095	0.479	0.0	9.1	9.1	73.9	O K
60 min Summer	16.205	0.589	0.0	9.1	9.1	90.8	O K
120 min Summer	16.443	0.827	0.0	9.1	9.1	127.5	O K
180 min Summer	16.785	1.169	0.0	9.1	9.1	180.2	O K
240 min Summer	17.027	1.411	0.0	9.1	9.1	217.6	O K
360 min Summer	17.272	1.656	0.0	9.1	9.1	255.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	371.8	312
30 min Summer	60.337	0.0	512.8	497
60 min Summer	39.120	0.0	740.5	724
120 min Summer	24.669	0.0	929.9	974
180 min Summer	18.673	0.0	1052.2	1152
240 min Summer	15.302	0.0	1146.1	1254
360 min Summer	11.522	0.0	1287.0	1424

Cascade Summary of Results for 20. Att Tank - Catchment 4.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Summer	17.881	2.265	0.0	10.3	10.3	269.6	O K
600 min Summer	18.131	2.515	0.0	10.8	10.8	269.9	O K
720 min Summer	18.151	2.535	0.0	10.8	10.8	269.9	O K
960 min Summer	18.175	2.559	0.0	10.9	10.9	269.9	O K
1440 min Summer	18.348	2.732	0.0	11.2	11.2	270.1	Flood Risk
2160 min Summer	18.572	2.956	0.0	11.7	11.7	270.3	Flood Risk
2880 min Summer	18.520	2.904	0.0	11.6	11.6	270.3	Flood Risk
4320 min Summer	18.378	2.762	0.0	11.3	11.3	270.1	Flood Risk
5760 min Summer	18.359	2.743	0.0	11.3	11.3	270.1	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Summer	9.408	0.0	1391.2	1490
600 min Summer	8.035	0.0	1427.7	1504
720 min Summer	7.061	0.0	1432.6	1604
960 min Summer	5.757	0.0	1442.1	1826
1440 min Summer	4.315	0.0	1458.7	1566
2160 min Summer	3.233	0.0	2254.4	1920
2880 min Summer	2.632	0.0	2432.1	2292
4320 min Summer	1.966	0.0	2605.2	3060
5760 min Summer	1.598	0.0	3020.9	4632

Cascade Summary of Results for 20. Att Tank - Catchment 4.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
7200 min Summer	18.374	2.758	0.0	11.3	11.3	270.1	Flood Risk
8640 min Summer	18.565	2.949	0.0	11.7	11.7	270.3	Flood Risk
10080 min Summer	18.523	2.907	0.0	11.6	11.6	270.3	Flood Risk
15 min Winter	15.970	0.354	0.0	8.9	8.9	54.6	O K
30 min Winter	16.095	0.479	0.0	9.1	9.1	73.9	O K
60 min Winter	16.205	0.589	0.0	9.1	9.1	90.8	O K
120 min Winter	16.442	0.826	0.0	9.1	9.1	127.4	O K
180 min Winter	16.785	1.169	0.0	9.1	9.1	180.2	O K
240 min Winter	17.028	1.412	0.0	9.1	9.1	217.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
7200 min Summer	1.360	0.0	3207.5	5184
8640 min Summer	1.192	0.0	3365.0	5192
10080 min Summer	1.066	0.0	3492.5	5944
15 min Winter	87.356	0.0	371.8	312
30 min Winter	60.337	0.0	512.8	497
60 min Winter	39.120	0.0	740.5	724
120 min Winter	24.669	0.0	930.1	974
180 min Winter	18.673	0.0	1052.1	1154
240 min Winter	15.302	0.0	1146.0	1256

Cascade Summary of Results for 20. Att Tank - Catchment 4.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
360 min Winter	17.274	1.658	0.0	9.1	9.1	255.6	O K
480 min Winter	17.895	2.279	0.0	10.3	10.3	269.7	O K
600 min Winter	18.134	2.518	0.0	10.8	10.8	269.9	O K
720 min Winter	18.152	2.536	0.0	10.9	10.9	269.9	O K
960 min Winter	18.177	2.561	0.0	10.9	10.9	269.9	O K
1440 min Winter	18.333	2.717	0.0	11.2	11.2	270.1	Flood Risk
2160 min Winter	18.564	2.948	0.0	11.7	11.7	270.3	Flood Risk
2880 min Winter	18.449	2.833	0.0	11.4	11.4	270.2	Flood Risk
4320 min Winter	18.391	2.775	0.0	11.3	11.3	270.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Winter	11.522	0.0	1287.0	1426
480 min Winter	9.408	0.0	1391.2	1488
600 min Winter	8.035	0.0	1428.3	1494
720 min Winter	7.061	0.0	1433.2	1600
960 min Winter	5.757	0.0	1443.5	1802
1440 min Winter	4.315	0.0	1462.2	1564
2160 min Winter	3.233	0.0	2254.4	1928
2880 min Winter	2.632	0.0	2432.5	2304
4320 min Winter	1.966	0.0	2628.7	3896

Cascade Summary of Results for 20. Att Tank - Catchment 4.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
5760 min Winter	18.628	3.012	0.0	11.8	11.8	270.4	Flood Risk
7200 min Winter	18.418	2.802	0.0	11.4	11.4	270.2	Flood Risk
8640 min Winter	17.762	2.146	0.0	10.0	10.0	269.5	O K
10080 min Winter	17.220	1.604	0.0	9.1	9.1	247.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Winter	1.598	0.0	3021.6	3744
7200 min Winter	1.360	0.0	3207.5	4520
8640 min Winter	1.192	0.0	3365.9	5552
10080 min Winter	1.066	0.0	3494.2	6712

Cascade Rainfall Details for 20. Att Tank - Catchment 4.SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.069

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.034	4	8	0.035

Cascade Model Details for 20. Att Tank - Catchment 4.SRCX

Storage is Online Cover Level (m) 18.632

Cellular Storage Structure

Invert Level (m) 15.616 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.60
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	257.0	257.0	1.745	257.0	257.0	1.746	0.0	257.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0128-9100-1745-9100	Sump Available	Yes
Design Head (m)	1.745	Diameter (mm)	128
Design Flow (l/s)	9.1	Invert Level (m)	15.616
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.745	9.1	Kick-Flo®	1.056	7.2
Flush-Flo™	0.509	9.1	Mean Flow over Head Range	-	8.0

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

Hydro-Brake® Optimum Outflow Control

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.6	0.600	9.0	1.600	8.7	2.600	11.0	5.000	15.0	7.500	18.2
0.200	7.9	0.800	8.7	1.800	9.2	3.000	11.8	5.500	15.7	8.000	18.8
0.300	8.7	1.000	7.7	2.000	9.7	3.500	12.6	6.000	16.3	8.500	19.3
0.400	9.0	1.200	7.6	2.200	10.1	4.000	13.5	6.500	17.0	9.000	19.9
0.500	9.1	1.400	8.2	2.400	10.6	4.500	14.2	7.000	17.6	9.500	20.4

Cascade Summary of Results for 16. Block A1 (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	20. Att Tank - Catchment 4.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	18.582	0.033	0.5	11.5	O K
30 min Summer	18.594	0.045	0.6	15.7	O K
60 min Summer	18.606	0.057	0.6	19.8	O K
120 min Summer	18.617	0.068	0.7	23.7	O K
180 min Summer	18.623	0.074	0.7	25.6	O K
240 min Summer	18.626	0.077	0.7	26.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	11.5	23
30 min Summer	60.337	0.0	15.8	37
60 min Summer	39.120	0.0	21.0	66
120 min Summer	24.669	0.0	26.5	126
180 min Summer	18.673	0.0	30.1	184
240 min Summer	15.302	0.0	32.9	244

Cascade Summary of Results for 16. Block A1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	18.629	0.080	0.8	27.8	O K
480 min Summer	18.631	0.082	0.8	28.5	O K
600 min Summer	18.632	0.083	0.8	28.9	O K
720 min Summer	18.633	0.084	0.8	29.1	O K
960 min Summer	18.632	0.083	0.8	29.0	O K
1440 min Summer	18.630	0.081	0.8	28.2	O K
2160 min Summer	18.625	0.076	0.7	26.4	O K
2880 min Summer	18.619	0.070	0.7	24.4	O K
4320 min Summer	18.609	0.060	0.7	21.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	37.2	298
480 min Summer	9.408	0.0	40.5	362
600 min Summer	8.035	0.0	43.2	428
720 min Summer	7.061	0.0	45.6	496
960 min Summer	5.757	0.0	49.5	636
1440 min Summer	4.315	0.0	55.4	912
2160 min Summer	3.233	0.0	62.7	1304
2880 min Summer	2.632	0.0	68.0	1704
4320 min Summer	1.966	0.0	76.3	2464

Cascade Summary of Results for 16. Block A1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	18.602	0.053	0.6	18.3	O K
7200 min Summer	18.595	0.046	0.6	16.1	O K
8640 min Summer	18.590	0.041	0.5	14.4	O K
10080 min Summer	18.586	0.037	0.5	13.0	O K
15 min Winter	18.582	0.033	0.5	11.5	O K
30 min Winter	18.594	0.045	0.6	15.7	O K
60 min Winter	18.606	0.057	0.6	19.8	O K
120 min Winter	18.617	0.068	0.7	23.7	O K
180 min Winter	18.623	0.074	0.7	25.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	82.7	3176
7200 min Summer	1.360	0.0	87.9	3896
8640 min Summer	1.192	0.0	92.5	4664
10080 min Summer	1.066	0.0	96.5	5344
15 min Winter	87.356	0.0	11.5	22
30 min Winter	60.337	0.0	15.8	37
60 min Winter	39.120	0.0	21.0	66
120 min Winter	24.669	0.0	26.5	124
180 min Winter	18.673	0.0	30.1	180

Cascade Summary of Results for 16. Block A1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	18.626	0.077	0.8	26.8	O K
360 min Winter	18.629	0.080	0.8	27.8	O K
480 min Winter	18.630	0.081	0.8	28.3	O K
600 min Winter	18.631	0.082	0.8	28.5	O K
720 min Winter	18.631	0.082	0.8	28.5	O K
960 min Winter	18.630	0.081	0.8	28.0	O K
1440 min Winter	18.625	0.076	0.7	26.4	O K
2160 min Winter	18.616	0.067	0.7	23.5	O K
2880 min Winter	18.609	0.060	0.7	20.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	32.9	234
360 min Winter	11.522	0.0	37.2	328
480 min Winter	9.408	0.0	40.5	376
600 min Winter	8.035	0.0	43.2	454
720 min Winter	7.061	0.0	45.6	532
960 min Winter	5.757	0.0	49.5	680
1440 min Winter	4.315	0.0	55.4	972
2160 min Winter	3.233	0.0	62.7	1388
2880 min Winter	2.632	0.0	68.0	1788

Cascade Summary of Results for 16. Block A1 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	18.597	0.048	0.6	16.5	O K
5760 min Winter	18.588	0.039	0.5	13.6	O K
7200 min Winter	18.582	0.033	0.5	11.5	O K
8640 min Winter	18.578	0.029	0.4	10.1	O K
10080 min Winter	18.575	0.026	0.4	9.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	76.3	2552
5760 min Winter	1.598	0.0	82.7	3280
7200 min Winter	1.360	0.0	87.9	3968
8640 min Winter	1.192	0.0	92.5	4664
10080 min Winter	1.066	0.0	96.5	5440

Cascade Rainfall Details for 16. Block A1 (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.054

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.054

Cascade Model Details for 16. Block A1 (Blue).SRCX

Storage is Online Cover Level (m) 20.800

Tank or Pond Structure

Invert Level (m) 18.549

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	348.0	0.097	348.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 18.549

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.031	0.4500	0.050	0.5900	0.072	0.7200	0.094	0.0830
0.043	0.5500	0.060	0.6600	0.084	0.7900	0.096	0.8400

Cascade Summary of Results for 17. Block A3 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	20. Att Tank - Catchment 4.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	17.336	0.022	0.1	2.6	O K
30 min Summer	17.344	0.030	0.1	3.5	O K
60 min Summer	17.352	0.038	0.1	4.4	O K
120 min Summer	17.360	0.046	0.1	5.3	O K
180 min Summer	17.364	0.050	0.2	5.7	O K
240 min Summer	17.366	0.052	0.2	6.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	2.5	23
30 min Summer	60.337	0.0	3.5	37
60 min Summer	39.120	0.0	4.6	66
120 min Summer	24.669	0.0	5.9	126
180 min Summer	18.673	0.0	6.7	184
240 min Summer	15.302	0.0	7.3	244

Cascade Summary of Results for 17. Block A3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	17.368	0.054	0.2	6.3	O K
480 min Summer	17.370	0.056	0.2	6.4	O K
600 min Summer	17.371	0.057	0.2	6.5	O K
720 min Summer	17.371	0.057	0.2	6.6	O K
960 min Summer	17.371	0.057	0.2	6.6	O K
1440 min Summer	17.370	0.056	0.2	6.4	O K
2160 min Summer	17.366	0.052	0.2	6.0	O K
2880 min Summer	17.363	0.049	0.2	5.6	O K
4320 min Summer	17.356	0.042	0.1	4.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	8.2	308
480 min Summer	9.408	0.0	9.0	372
600 min Summer	8.035	0.0	9.6	436
720 min Summer	7.061	0.0	10.1	504
960 min Summer	5.757	0.0	11.0	642
1440 min Summer	4.315	0.0	12.3	914
2160 min Summer	3.233	0.0	13.9	1324
2880 min Summer	2.632	0.0	15.1	1708
4320 min Summer	1.966	0.0	16.9	2468

Cascade Summary of Results for 17. Block A3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	17.351	0.037	0.1	4.3	O K
7200 min Summer	17.347	0.033	0.1	3.8	O K
8640 min Summer	17.343	0.029	0.1	3.4	O K
10080 min Summer	17.340	0.026	0.1	3.0	O K
15 min Winter	17.336	0.022	0.1	2.6	O K
30 min Winter	17.344	0.030	0.1	3.5	O K
60 min Winter	17.352	0.038	0.1	4.4	O K
120 min Winter	17.360	0.046	0.1	5.3	O K
180 min Winter	17.364	0.050	0.2	5.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	18.4	3224
7200 min Summer	1.360	0.0	19.5	3960
8640 min Summer	1.192	0.0	20.5	4672
10080 min Summer	1.066	0.0	21.4	5440
15 min Winter	87.356	0.0	2.5	22
30 min Winter	60.337	0.0	3.5	37
60 min Winter	39.120	0.0	4.6	66
120 min Winter	24.669	0.0	5.9	124
180 min Winter	18.673	0.0	6.7	180

Cascade Summary of Results for 17. Block A3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	17.366	0.052	0.2	6.0	O K
360 min Winter	17.369	0.055	0.2	6.3	O K
480 min Winter	17.370	0.056	0.2	6.4	O K
600 min Winter	17.370	0.056	0.2	6.4	O K
720 min Winter	17.370	0.056	0.2	6.5	O K
960 min Winter	17.369	0.055	0.2	6.4	O K
1440 min Winter	17.366	0.052	0.2	6.0	O K
2160 min Winter	17.361	0.047	0.1	5.4	O K
2880 min Winter	17.356	0.042	0.1	4.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	7.3	236
360 min Winter	11.522	0.0	8.2	338
480 min Winter	9.408	0.0	9.0	382
600 min Winter	8.035	0.0	9.6	458
720 min Winter	7.061	0.0	10.1	538
960 min Winter	5.757	0.0	11.0	688
1440 min Winter	4.315	0.0	12.3	984
2160 min Winter	3.233	0.0	13.9	1392
2880 min Winter	2.632	0.0	15.1	1792

Cascade Summary of Results for 17. Block A3 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	17.348	0.034	0.1	3.9	O K
5760 min Winter	17.342	0.028	0.1	3.2	O K
7200 min Winter	17.337	0.023	0.1	2.6	O K
8640 min Winter	17.334	0.020	0.1	2.3	O K
10080 min Winter	17.332	0.018	0.1	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	16.9	2560
5760 min Winter	1.598	0.0	18.4	3344
7200 min Winter	1.360	0.0	19.5	3968
8640 min Winter	1.192	0.0	20.5	4664
10080 min Winter	1.066	0.0	21.4	5440

Cascade Rainfall Details for 17. Block A3 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.012

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.012

Cascade Model Details for 17. Block A3 (Green).SRCX

Storage is Online Cover Level (m) 19.700

Tank or Pond Structure

Invert Level (m) 17.314

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	115.0	0.114	115.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 17.314

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.021	0.1000	0.033	0.1200	0.047	0.1500	0.061	0.1700
0.029	0.1100	0.040	0.1400	0.055	0.1600	0.063	0.1800

Cascade Summary of Results for 19. Block A4 (Green).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	20. Att Tank - Catchment 4.SRCX	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	16.066	0.022	0.1	2.8	O K
30 min Summer	16.074	0.030	0.1	3.8	O K
60 min Summer	16.082	0.038	0.1	4.8	O K
120 min Summer	16.090	0.046	0.1	5.8	O K
180 min Summer	16.094	0.050	0.2	6.3	O K
240 min Summer	16.096	0.052	0.2	6.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	2.7	23
30 min Summer	60.337	0.0	3.8	37
60 min Summer	39.120	0.0	5.0	66
120 min Summer	24.669	0.0	6.4	126
180 min Summer	18.673	0.0	7.2	186
240 min Summer	15.302	0.0	7.9	244

Cascade Summary of Results for 19. Block A4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	16.099	0.055	0.2	6.9	O K
480 min Summer	16.100	0.056	0.2	7.1	O K
600 min Summer	16.101	0.057	0.2	7.2	O K
720 min Summer	16.102	0.058	0.2	7.3	O K
960 min Summer	16.102	0.058	0.2	7.4	O K
1440 min Summer	16.101	0.057	0.2	7.2	O K
2160 min Summer	16.098	0.054	0.2	6.9	O K
2880 min Summer	16.095	0.051	0.2	6.4	O K
4320 min Summer	16.088	0.044	0.1	5.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	8.9	322
480 min Summer	9.408	0.0	9.7	384
600 min Summer	8.035	0.0	10.4	448
720 min Summer	7.061	0.0	10.9	512
960 min Summer	5.757	0.0	11.9	652
1440 min Summer	4.315	0.0	13.2	928
2160 min Summer	3.233	0.0	15.1	1340
2880 min Summer	2.632	0.0	16.4	1732
4320 min Summer	1.966	0.0	18.3	2508

Cascade Summary of Results for 19. Block A4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	16.083	0.039	0.1	5.0	O K
7200 min Summer	16.079	0.035	0.1	4.5	O K
8640 min Summer	16.076	0.032	0.1	4.0	O K
10080 min Summer	16.073	0.029	0.1	3.6	O K
15 min Winter	16.066	0.022	0.1	2.8	O K
30 min Winter	16.074	0.030	0.1	3.8	O K
60 min Winter	16.082	0.038	0.1	4.8	O K
120 min Winter	16.090	0.046	0.1	5.8	O K
180 min Winter	16.094	0.050	0.2	6.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	19.9	3232
7200 min Summer	1.360	0.0	21.2	3968
8640 min Summer	1.192	0.0	22.2	4752
10080 min Summer	1.066	0.0	23.2	5448
15 min Winter	87.356	0.0	2.7	22
30 min Winter	60.337	0.0	3.8	37
60 min Winter	39.120	0.0	5.0	66
120 min Winter	24.669	0.0	6.4	124
180 min Winter	18.673	0.0	7.2	180

Cascade Summary of Results for 19. Block A4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	16.096	0.052	0.2	6.6	O K
360 min Winter	16.099	0.055	0.2	7.0	O K
480 min Winter	16.100	0.056	0.2	7.1	O K
600 min Winter	16.101	0.057	0.2	7.2	O K
720 min Winter	16.101	0.057	0.2	7.2	O K
960 min Winter	16.101	0.057	0.2	7.2	O K
1440 min Winter	16.098	0.054	0.2	6.9	O K
2160 min Winter	16.093	0.049	0.2	6.2	O K
2880 min Winter	16.088	0.044	0.1	5.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	7.9	236
360 min Winter	11.522	0.0	8.9	344
480 min Winter	9.408	0.0	9.7	392
600 min Winter	8.035	0.0	10.4	468
720 min Winter	7.061	0.0	10.9	546
960 min Winter	5.757	0.0	11.9	698
1440 min Winter	4.315	0.0	13.2	998
2160 min Winter	3.233	0.0	15.1	1412
2880 min Winter	2.632	0.0	16.4	1820

Cascade Summary of Results for 19. Block A4 (Green).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	16.080	0.036	0.1	4.6	O K
5760 min Winter	16.075	0.031	0.1	3.9	O K
7200 min Winter	16.069	0.025	0.1	3.2	O K
8640 min Winter	16.065	0.021	0.1	2.7	O K
10080 min Winter	16.063	0.019	0.1	2.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	18.3	2600
5760 min Winter	1.598	0.0	19.9	3392
7200 min Winter	1.360	0.0	21.1	4104
8640 min Winter	1.192	0.0	22.2	4672
10080 min Winter	1.066	0.0	23.2	5440

Cascade Rainfall Details for 19. Block A4 (Green).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.013

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.013

Cascade Model Details for 19. Block A4 (Green).SRCX

Storage is Online Cover Level (m) 18.600

Tank or Pond Structure

Invert Level (m) 16.044

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	127.0	0.114	127.0	0.115	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 16.044

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.021	0.1000	0.033	0.1200	0.048	0.1500	0.065	0.1800
0.029	0.1100	0.040	0.1400	0.056	0.1600	0.630	0.1700

Cascade Summary of Results for 18. Block A5 (Blue).SRCX

Upstream Structures	Outflow To	Overflow To
(None)	(None)	(None)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	16.054	0.034	0.3	7.9	O K
30 min Summer	16.066	0.046	0.4	10.7	O K
60 min Summer	16.078	0.058	0.5	13.5	O K
120 min Summer	16.089	0.069	0.5	16.2	O K
180 min Summer	16.095	0.075	0.5	17.4	O K
240 min Summer	16.098	0.078	0.5	18.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	87.356	0.0	7.9	23
30 min Summer	60.337	0.0	10.9	37
60 min Summer	39.120	0.0	14.4	66
120 min Summer	24.669	0.0	18.1	126
180 min Summer	18.673	0.0	20.6	184
240 min Summer	15.302	0.0	22.5	238

Cascade Summary of Results for 18. Block A5 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
360 min Summer	16.101	0.081	0.5	18.9	O K
480 min Summer	16.103	0.083	0.5	19.3	O K
600 min Summer	16.104	0.084	0.5	19.6	O K
720 min Summer	16.104	0.084	0.6	19.7	O K
960 min Summer	16.104	0.084	0.6	19.6	O K
1440 min Summer	16.101	0.081	0.5	19.0	O K
2160 min Summer	16.096	0.076	0.5	17.6	O K
2880 min Summer	16.090	0.070	0.5	16.3	O K
4320 min Summer	16.080	0.060	0.5	13.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
360 min Summer	11.522	0.0	25.5	294
480 min Summer	9.408	0.0	27.7	358
600 min Summer	8.035	0.0	29.6	426
720 min Summer	7.061	0.0	31.2	494
960 min Summer	5.757	0.0	34.0	630
1440 min Summer	4.315	0.0	38.1	910
2160 min Summer	3.233	0.0	43.0	1304
2880 min Summer	2.632	0.0	46.6	1704
4320 min Summer	1.966	0.0	52.3	2464

Cascade Summary of Results for 18. Block A5 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
5760 min Summer	16.072	0.052	0.4	12.0	O K
7200 min Summer	16.066	0.046	0.4	10.6	O K
8640 min Summer	16.061	0.041	0.4	9.5	O K
10080 min Summer	16.057	0.037	0.3	8.5	O K
15 min Winter	16.054	0.034	0.3	7.9	O K
30 min Winter	16.066	0.046	0.4	10.7	O K
60 min Winter	16.078	0.058	0.5	13.5	O K
120 min Winter	16.090	0.070	0.5	16.2	O K
180 min Winter	16.095	0.075	0.5	17.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
5760 min Summer	1.598	0.0	56.6	3176
7200 min Summer	1.360	0.0	60.3	3896
8640 min Summer	1.192	0.0	63.4	4592
10080 min Summer	1.066	0.0	66.1	5344
15 min Winter	87.356	0.0	7.9	22
30 min Winter	60.337	0.0	10.9	37
60 min Winter	39.120	0.0	14.4	66
120 min Winter	24.669	0.0	18.1	122
180 min Winter	18.673	0.0	20.6	180

Cascade Summary of Results for 18. Block A5 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
240 min Winter	16.098	0.078	0.5	18.2	O K
360 min Winter	16.101	0.081	0.5	18.8	O K
480 min Winter	16.102	0.082	0.5	19.2	O K
600 min Winter	16.103	0.083	0.5	19.3	O K
720 min Winter	16.103	0.083	0.5	19.3	O K
960 min Winter	16.101	0.081	0.5	18.9	O K
1440 min Winter	16.096	0.076	0.5	17.6	O K
2160 min Winter	16.087	0.067	0.5	15.6	O K
2880 min Winter	16.079	0.059	0.5	13.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	15.302	0.0	22.5	234
360 min Winter	11.522	0.0	25.5	302
480 min Winter	9.408	0.0	27.7	374
600 min Winter	8.035	0.0	29.6	450
720 min Winter	7.061	0.0	31.2	528
960 min Winter	5.757	0.0	34.0	678
1440 min Winter	4.315	0.0	38.1	970
2160 min Winter	3.233	0.0	43.0	1384
2880 min Winter	2.632	0.0	46.6	1788

Cascade Summary of Results for 18. Block A5 (Blue).SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
4320 min Winter	16.067	0.047	0.4	10.9	O K
5760 min Winter	16.058	0.038	0.4	8.9	O K
7200 min Winter	16.052	0.032	0.3	7.4	O K
8640 min Winter	16.048	0.028	0.3	6.6	O K
10080 min Winter	16.046	0.026	0.3	6.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Winter	1.966	0.0	52.3	2516
5760 min Winter	1.598	0.0	56.6	3272
7200 min Winter	1.360	0.0	60.3	3960
8640 min Winter	1.192	0.0	63.4	4664
10080 min Winter	1.066	0.0	66.1	5344

Cascade Rainfall Details for 18. Block A5 (Blue).SRCX

Rainfall Model	FSR	Ratio R	0.278	Cv (Winter)	1.000
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	Scotland and Ireland	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	16.600	Cv (Summer)	1.000	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.037

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.000	4	8	0.037

Cascade Model Details for 18. Block A5 (Blue).SRCX

Storage is Online Cover Level (m) 18.600

Tank or Pond Structure

Invert Level (m) 16.020

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	233.0	0.097	233.0	0.098	0.0

Depth/Flow Relationship Outflow Control

Invert Level (m) 16.020

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.031	0.3200	0.050	0.4200	0.072	0.5100	0.093	0.5800
0.043	0.3800	0.061	0.4600	0.084	0.5500	0.096	0.5900

Appendix C : Surface Water Drainage Calculations

PROJECT			JOB REF.
SANDFORD ROAD			190226
SUBJECT			**Calc. Sheet No.**
Surface Water Calculations - Permissible Site Discharge			1
Drawing ref.	**Calculations by**	**Checked by**	**Date**
190226-Site Services Layout	SM	ED	04.12.25

PERMISSIBLE SURFACE WATER DISCHARGE CALCULATIONS

Site Area

What is the overall site area? **2.39** Hectares (ha) Site is Less than 50 Hectares

Pre-Development Catchment Soil Characteristics

Are there different soil types present on the pre-developed site? No

Catchment (This refers to the entire site area)	1	
Area	2.39	Hectares (ha)
Drainage Group	1	Class
Depth to Impermeable Layers	2	Class
Permeability Group above Impermeable Layers	3	Class
Slope (°)	2	Class
SOIL Type	3	From FSR Table
[1]SOIL Index	0.40	

SOIL	SOIL Value	SPR
1	0.15	0.10
2	0.30	0.30
3	0.40	0.37
4	0.45	0.47
5	0.50	0.53

Site SOIL Index Value **0.40**

Site SPR Value **0.37**

Post-Development Catchment Characteristics

Is the development divided into sub-catchments? No

What is the overall site area for catchment? 2.39 Hectares (ha)

Hardstand	Area (m^2)	Runoff Coeff.	Effective Area (m^2)
Roof Areas	10790	0.93	10075
Roads/Footpaths (Draining to Network)	6110	0.95	5760
Roads/Footpaths (Draining to SUDS)	1530	0.80	1230
Permeable Paving	700	0.50	340
Landscape	4740	0.40	1880
Total	23870	0.81	19285

Include Public Open Space in Effective Cat: No — Assumed open space area does not drain to surface water network

Effective Catchment Area **19285.0** m^2

Effective Catchment Runoff Coefficient **0.70**

Long-Term Storage

Is long-term Storage provided? No

Permissible Site Discharge

What is the Standard Average Annual Rainfall (SAAR)? 770.0 mm — From Met Eireann, Co-ordinates 317000 231000

Is the overall site area less than 50 hectares? Yes

[5]$QBAR_{Rural}$ calculated for 50 ha and linearly interpolated for area of site 9.1 Litres/sec

[7]Site Discharge = **9.1** Litres/sec

Notes and Formulae

1. SOIL index value calculated from Flood Studies Report - The Classification of Soils from Winter Rainfall Acceptance Rate (Table 4.5).
2. SPR value calculated from GDSDS - Table 6.7.
3. Rainfall depth for 100 year return period, 6 hour duration with additional 10% for climate change.
4. Long-term storage Vol_{xs} (m^3) = Rainfall.Area.10.[(PIMP/100)(0.8.α)+(1-PIMP/100)(β.SPR)-SPR]. (GDSDS Section 6.7.3).
   Where long-term storage cannot be provided on-site due to ground conditions, Total Permissible Outflow is to be kept to $QBAR_{(Rural)}$.
5. Total Permissible Outflow - $QBAR_{(Rural)}$ calculated in accordance with GDSDS - Regional Drainage Policies
   (Volume 2 - Chapter 6), i.e. $QBAR(m3/s)=0.00108x(Area)^{0.89}(SAAR)^{1.17}(SOIL)^{2.17}$ - For catchments greater than 50 hectares in area. Flow rates are linearly interpolated for areas samller than 50hectares.
6. Where Total Permissible Outflow is less than 2.0l/s and not achievable, use 2.0 l/s or closest value possible.
7. QBAR multiplied by growth factors of 0.85 for 1 year, 2.1 for 30 year and 2.6 for 100 year return period events, from GDSDS Figure C2.

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW_1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	16.600	Volumetric Runoff Coeff.	1.000	Min Design Depth for Optimisation (m)	1.200
Ratio R	0.278	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	100	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	500
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.200		

Designed with Level Soffits

Network Design Table for SW_1

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P1.000	1.202	0.020	60.1	0.014	4.00	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)
P1.000	67.55	4.01	20.491	0.014	0.0	0.0	0.0	1.69	67.2	3.4

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P1.001	5.762	0.096	60.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P2.000	1.221	0.020	61.1	0.034	4.00	0.0	0.600	o	225	Pipe/Conduit	
P2.001	6.947	0.116	59.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.002	21.577	0.127	169.9	0.009	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.003	21.801	0.128	170.3	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.004	14.402	0.085	169.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.005	5.779	0.001	5779.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.006	18.900	0.458	41.3	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.007	24.832	0.270	92.0	0.035	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)
P1.001	67.24	4.07	20.471	0.014	0.0	0.0	0.0	1.69	67.2	3.4
P2.000	67.55	4.01	20.511	0.034	0.0	0.0	0.0	1.68	66.7	8.3
P2.001	67.17	4.08	20.491	0.034	0.0	0.0	0.0	1.69	67.3	8.3
P1.002	65.27	4.44	20.375	0.057	0.0	0.0	0.0	1.00	39.8	13.3
P1.003	63.47	4.80	20.248	0.064	0.0	0.0	0.0	1.00	39.7	14.6
P1.004	62.35	5.04	20.120	0.064	0.0	0.0	0.0	1.00	39.8	14.6
P1.005	59.79	5.63	20.035	0.064	0.0	0.0	0.0	0.16	6.5«	14.6
P1.006	59.17	5.79	20.034	0.068	0.0	0.0	0.0	2.04	81.2	14.6
P1.007	57.98	6.09	19.576	0.103	0.0	0.0	0.0	1.36	54.2	21.5

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P1.008	8.243	0.081	101.8	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
P3.000	14.082	0.120	117.4	0.023	4.00	0.0	0.600	o	225	Pipe/Conduit	
P3.001	4.220	0.099	42.6	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
P3.002	10.820	0.154	70.3	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
P3.003	47.738	0.513	93.0	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
P4.000	0.732	0.007	104.6	0.000	4.00	0.0	0.600	o	300	Pipe/Conduit	
P4.001	19.926	0.199	100.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P5.000	1.339	0.006	223.2	0.015	4.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
P1.008	57.58	6.20	19.306	0.114	0.0	0.0	0.0	1.30	51.5	23.7
P3.000	66.55	4.19	19.695	0.023	0.0	0.0	0.0	1.21	48.0	5.4
P3.001	66.36	4.23	19.575	0.041	0.0	0.0	0.0	2.01	79.9	9.9
P3.002	65.76	4.35	19.476	0.051	0.0	0.0	0.0	1.56	62.1	12.1
P3.003	62.87	4.93	19.322	0.085	0.0	0.0	0.0	1.36	53.9	19.4
P4.000	67.57	4.01	18.950	0.000	0.0	0.0	0.0	1.54	108.7	0.0
P4.001	66.42	4.22	18.943	0.000	0.0	0.0	0.0	1.57	111.1	0.0
P5.000	67.50	4.02	18.782	0.015	0.0	0.0	0.0	1.05	74.1	3.7

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P5.001	7.667	0.032	239.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.009	20.873	0.113	184.7	0.025	0.00	0.0	0.600	o	300	Pipe/Conduit	
P6.000	31.056	0.545	57.0	0.056	4.00	0.0	0.600	o	225	Pipe/Conduit	
P7.000	1.869	0.012	155.8	0.013	4.00	0.0	0.600	o	225	Pipe/Conduit	
P7.001	6.226	0.042	148.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.010	22.007	0.082	268.4	0.032	0.00	0.0	0.600	o	375	Pipe/Conduit	
P1.011	16.646	0.055	302.7	0.040	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)
P5.001	66.81	4.15	18.776	0.015	0.0	0.0	0.0	1.01	71.5	3.7
P1.009	56.48	6.50	18.744	0.239	0.0	0.0	0.0	1.15	81.5	48.8
P6.000	66.00	4.30	19.475	0.056	0.0	0.0	0.0	1.74	69.0	13.4
P7.000	67.45	4.03	18.760	0.013	0.0	0.0	0.0	1.05	41.6	3.2
P7.001	66.92	4.13	18.748	0.013	0.0	0.0	0.0	1.07	42.6	3.2
P1.010	55.33	6.83	18.556	0.340	0.0	0.0	0.0	1.10	121.6	67.9
P1.011	54.44	7.10	18.474	0.380	0.0	0.0	0.0	1.04	114.4	74.7

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P1.012	15.681	0.054	290.4	0.062	0.00	0.0	0.600	o	375	Pipe/Conduit	
P8.000	1.481	0.025	59.2	0.037	4.00	0.0	0.600	o	225	Pipe/Conduit	
P8.001	4.273	0.071	60.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P8.002	22.212	0.370	60.0	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
P8.003	20.196	0.249	81.1	0.014	0.00	0.0	0.600	o	225	Pipe/Conduit	
P8.004	24.084	0.262	91.9	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
P9.000	3.053	0.051	59.9	0.043	4.00	0.0	0.600	o	225	Pipe/Conduit	
P9.001	4.987	0.083	60.1	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)
P1.012	53.65	7.35	18.419	0.442	0.0	0.0	0.0	1.06	116.9	85.7
P8.000	67.54	4.01	20.571	0.037	0.0	0.0	0.0	1.70	67.7	9.0
P8.001	67.30	4.06	20.546	0.037	0.0	0.0	0.0	1.69	67.2	9.0
P8.002	66.12	4.28	20.475	0.048	0.0	0.0	0.0	1.69	67.2	11.4
P8.003	64.92	4.51	20.105	0.061	0.0	0.0	0.0	1.45	57.8	14.3
P8.004	63.48	4.80	19.735	0.069	0.0	0.0	0.0	1.36	54.2	15.9
P9.000	67.45	4.03	19.607	0.043	0.0	0.0	0.0	1.69	67.3	10.5
P9.001	67.18	4.08	19.556	0.043	0.0	0.0	0.0	1.69	67.2	10.5

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P8.005	49.237	0.801	61.5	0.009	0.00	0.0	0.600	o	225	Pipe/Conduit	
P10.000	27.514	0.379	72.6	0.020	4.00	0.0	0.600	o	225	Pipe/Conduit	
P8.006	32.718	0.157	208.4	0.024	0.00	0.0	0.600	o	375	Pipe/Conduit	
P1.013	11.784	0.038	310.1	0.024	0.00	0.0	0.600	o	375	Pipe/Conduit	
P1.014	21.058	0.070	300.8	0.029	0.00	0.0	0.600	o	375	Pipe/Conduit	
P11.000	2.492	0.043	58.0	0.054	4.00	0.0	0.600	o	225	Pipe/Conduit	
P11.001	8.322	0.142	58.6	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)
P8.005	61.24	5.29	19.473	0.121	0.0	0.0	0.0	1.67	66.4	26.7
P10.000	66.00	4.30	19.475	0.020	0.0	0.0	0.0	1.54	61.1	4.8
P8.006	59.41	5.73	18.522	0.165	0.0	0.0	0.0	1.25	138.2	35.4
P1.013	53.06	7.54	18.365	0.631	0.0	0.0	0.0	1.02	113.0«	120.9
P1.014	52.05	7.88	18.327	0.660	0.0	0.0	0.0	1.04	114.8«	124.0
P11.000	67.48	4.02	18.592	0.054	0.0	0.0	0.0	1.72	68.4	13.2
P11.001	67.04	4.11	18.549	0.054	0.0	0.0	0.0	1.71	68.1	13.2

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P1.015	52.586	0.939	56.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P1.016	16.834	0.288	58.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P12.000	2.362	0.039	60.6	0.012	4.00	0.0	0.600	o	225	Pipe/Conduit	
P12.001	8.029	0.134	59.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P1.017	17.696	0.324	54.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P13.000	1.741	0.029	60.0	0.042	4.00	0.0	0.600	o	225	Pipe/Conduit	
P13.001	6.897	0.115	60.0	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)
P1.015	51.03	8.24	18.257	0.714	0.0	0.0	0.0	2.43	267.9	131.5
P1.016	50.71	8.36	17.318	0.714	0.0	0.0	0.0	2.37	262.2	131.5
P12.000	67.49	4.02	17.353	0.012	0.0	0.0	0.0	1.68	66.9	2.9
P12.001	67.05	4.10	17.314	0.012	0.0	0.0	0.0	1.69	67.3	2.9
P1.017	50.38	8.48	17.030	0.726	0.0	0.0	0.0	2.45	271.1	132.0
P13.000	67.52	4.02	19.719	0.042	0.0	0.0	0.0	1.69	67.2	10.2
P13.001	67.15	4.09	19.690	0.042	0.0	0.0	0.0	1.69	67.3	10.2

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P13.002	45.715	0.569	80.3	0.091	0.00	0.0	0.600	o	225	Pipe/Conduit	
P14.000	1.763	0.029	60.8	0.043	4.00	0.0	0.600	o	225	Pipe/Conduit	
P14.001	5.353	0.089	60.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P13.003	35.871	0.864	41.5	0.058	0.00	0.0	0.600	o	225	Pipe/Conduit	
P15.000	1.547	0.026	59.5	0.025	4.00	0.0	0.600	o	225	Pipe/Conduit	
P15.001	7.006	0.118	59.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P16.000	1.963	0.033	59.5	0.010	4.00	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)
P13.002	64.43	4.61	19.575	0.133	0.0	0.0	0.0	1.46	58.1	30.9
P14.000	67.52	4.02	19.124	0.043	0.0	0.0	0.0	1.68	66.8	10.5
P14.001	67.23	4.07	19.095	0.043	0.0	0.0	0.0	1.69	67.2	10.5
P13.003	63.01	4.90	19.006	0.234	0.0	0.0	0.0	2.04	81.0	53.3
P15.000	67.53	4.02	18.284	0.025	0.0	0.0	0.0	1.70	67.5	6.1
P15.001	67.15	4.08	18.258	0.025	0.0	0.0	0.0	1.70	67.6	6.1
P16.000	67.51	4.02	18.284	0.010	0.0	0.0	0.0	1.70	67.6	2.4

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P16.001	6.564	0.111	59.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P13.004	40.766	0.748	54.5	0.044	0.00	0.0	0.600	o	225	Pipe/Conduit	
P17.000	1.675	0.025	67.0	0.022	4.00	0.0	0.600	o	225	Pipe/Conduit	
P17.001	3.235	0.054	59.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P18.000	1.661	0.028	59.3	0.029	4.00	0.0	0.600	o	225	Pipe/Conduit	
P18.001	3.933	0.068	57.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P13.005	36.003	0.606	59.4	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
P16.001	67.16	4.08	18.251	0.010	0.0	0.0	0.0	1.70	67.8	2.4
P13.004	61.28	5.28	18.140	0.313	0.0	0.0	0.0	1.78	70.6	69.2
P17.000	67.52	4.02	17.473	0.022	0.0	0.0	0.0	1.60	63.6	5.4
P17.001	67.34	4.05	17.448	0.022	0.0	0.0	0.0	1.69	67.3	5.4
P18.000	67.53	4.02	17.488	0.029	0.0	0.0	0.0	1.70	67.6	7.1
P18.001	67.32	4.05	17.460	0.029	0.0	0.0	0.0	1.72	68.5	7.1
P13.005	60.03	5.58	17.317	0.382	0.0	0.0	0.0	2.04	144.5	82.7

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P19.000	0.956	0.016	59.8	0.008	4.00	0.0	0.600	o	300	Pipe/Conduit	
P19.001	3.279	0.055	59.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P13.006	20.066	0.147	136.5	0.033	0.00	0.0	0.600	o	300	Pipe/Conduit	
P20.000	2.496	0.042	59.4	0.046	4.00	0.0	0.600	o	225	Pipe/Conduit	
P20.001	3.774	0.063	59.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P20.002	33.271	0.119	279.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P21.000	2.104	0.008	263.0	0.038	4.00	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)
P19.000	67.57	4.01	16.782	0.008	0.0	0.0	0.0	2.04	144.0	2.0
P19.001	67.43	4.03	16.766	0.008	0.0	0.0	0.0	2.04	144.2	2.0
P13.006	59.02	5.83	16.711	0.423	0.0	0.0	0.0	1.34	95.0	90.1
P20.000	67.48	4.02	17.198	0.046	0.0	0.0	0.0	1.70	67.6	11.2
P20.001	67.31	4.06	17.081	0.046	0.0	0.0	0.0	2.04	143.9	11.2
P20.002	64.61	4.57	16.944	0.046	0.0	0.0	0.0	1.08	119.1	11.2
P21.000	67.44	4.03	17.001	0.038	0.0	0.0	0.0	1.11	122.9	9.3

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P21.001	4.919	0.168	29.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P20.003	40.609	0.145	280.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P20.004	11.875	0.066	179.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P22.000	1.388	0.024	57.8	0.088	4.00	0.0	0.600	o	225	Pipe/Conduit	
P22.001	8.208	0.140	58.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P22.002	13.785	0.202	68.2	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
P23.000	7.302	0.073	100.0	0.201	4.00	0.0	0.600	o	450	Pipe/Conduit	
P23.001	3.583	0.036	99.5	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)
P21.001	67.31	4.06	16.993	0.038	0.0	0.0	0.0	3.36	371.0	9.3
P20.003	61.66	5.20	16.825	0.084	0.0	0.0	0.0	1.08	119.0	18.7
P20.004	61.01	5.34	16.680	0.084	0.0	0.0	0.0	1.35	148.8	18.7
P22.000	67.54	4.01	17.039	0.088	0.0	0.0	0.0	1.72	68.5	21.5
P22.001	67.18	4.08	16.940	0.088	0.0	0.0	0.0	2.06	145.4	21.5
P22.002	66.52	4.20	16.800	0.098	0.0	0.0	0.0	1.91	134.7	23.6
P23.000	67.29	4.06	16.665	0.201	0.0	0.0	0.0	2.03	323.3	48.8
P23.001	67.10	4.09	16.592	0.201	0.0	0.0	0.0	1.82	200.6	48.8

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P23.002	3.288	0.033	100.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P22.003	16.913	0.080	211.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
P13.007	22.451	0.070	320.7	0.029	0.00	0.0	0.600	o	375	Pipe/Conduit	
P24.000	1.938	0.019	102.0	0.021	4.00	0.0	0.600	o	225	Pipe/Conduit	
P24.001	3.374	0.034	99.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P13.008	31.246	0.089	351.1	0.052	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)
P23.002	66.94	4.12	16.556	0.201	0.0	0.0	0.0	1.81	200.1	48.8
P22.003	65.33	4.43	16.523	0.299	0.0	0.0	0.0	1.24	137.2	70.6
P13.007	57.58	6.20	16.443	0.835	0.0	0.0	0.0	1.01	111.1«	173.7
P24.000	67.48	4.02	16.576	0.021	0.0	0.0	0.0	1.29	51.5	5.1
P24.001	67.24	4.07	16.557	0.021	0.0	0.0	0.0	1.31	52.2	5.1
P13.008	55.85	6.68	16.298	0.908	0.0	0.0	0.0	1.08	171.6«	183.1

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P25.000	23.211	0.152	153.0	0.027	4.00	0.0	0.600	o	225	Pipe/Conduit	
P13.009	9.558	0.034	281.1	0.007	0.00	0.0	0.600	o	450	Pipe/Conduit	
P13.010	27.632	0.099	279.1	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
P26.000	1.857	0.031	59.9	0.016	4.00	0.0	0.600	o	225	Pipe/Conduit	
P26.001	3.203	0.053	60.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P13.011	11.403	0.036	316.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
P13.012	25.558	0.102	250.6	0.008	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)
P25.000	65.64	4.37	16.955	0.027	0.0	0.0	0.0	1.05	41.9	6.5
P13.009	55.40	6.81	16.209	0.942	0.0	0.0	0.0	1.21	192.1	188.5
P13.010	54.14	7.19	16.175	0.979	0.0	0.0	0.0	1.21	192.7	191.5
P26.000	67.52	4.02	16.385	0.016	0.0	0.0	0.0	1.69	67.3	3.9
P26.001	67.34	4.05	16.354	0.016	0.0	0.0	0.0	1.69	67.0	3.9
P13.011	53.61	7.36	16.076	0.995	0.0	0.0	0.0	1.14	180.8«	192.7
P13.012	52.60	7.69	16.040	1.003	0.0	0.0	0.0	1.28	203.5	192.7

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P27.000	1.779	0.036	49.4	0.037	4.00	0.0	0.600	o	450	Pipe/Conduit	
P27.001	4.085	0.082	49.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
P13.013	45.024	0.183	246.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
P28.000	1.540	0.026	59.2	0.013	4.00	0.0	0.600	o	225	Pipe/Conduit	
P28.001	3.858	0.064	60.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
P13.014	12.031	0.036	334.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
P1.018	14.167	0.104	136.2	0.010	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)
P27.000	67.56	4.01	16.056	0.037	0.0	0.0	0.0	2.90	460.8	9.0
P27.001	67.43	4.03	16.020	0.037	0.0	0.0	0.0	2.89	459.0	9.0
P13.013	50.94	8.27	15.938	1.040	0.0	0.0	0.0	1.29	205.4	192.7
P28.000	67.53	4.02	16.070	0.013	0.0	0.0	0.0	1.70	67.7	3.2
P28.001	67.32	4.05	16.044	0.013	0.0	0.0	0.0	1.69	67.1	3.2
P13.014	50.44	8.45	15.755	1.053	0.0	0.0	0.0	1.11	176.0«	192.7
P1.018	50.02	8.61	15.720	1.789	0.0	0.0	0.0	1.74	276.8«	323.1

Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
P1.019	6.652	0.027	246.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.020	25.408	0.135	188.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.021	29.654	0.131	226.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.022	29.869	0.121	246.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.023	20.136	0.082	245.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.024	24.969	0.101	247.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.025	34.840	0.141	247.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.026	36.693	0.147	249.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.027	38.349	0.153	250.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
P1.028	85.781	0.340	252.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
P1.019	49.73	8.72	15.616	1.789	0.0	0.0	0.0	1.00	70.5«	323.1
P1.020	48.80	9.09	15.589	1.789	0.0	0.0	0.0	1.14	80.8«	323.1
P1.021	47.66	9.57	15.454	1.789	0.0	0.0	0.0	1.04	73.6«	323.1
P1.022	46.53	10.07	15.323	1.789	0.0	0.0	0.0	1.00	70.4«	323.1
P1.023	45.81	10.40	15.202	1.789	0.0	0.0	0.0	1.00	70.6«	323.1
P1.024	44.95	10.82	15.120	1.789	0.0	0.0	0.0	1.00	70.4«	323.1
P1.025	43.81	11.41	14.150	1.789	0.0	0.0	0.0	1.00	70.4«	323.1
P1.026	42.68	12.02	14.009	1.789	0.0	0.0	0.0	0.99	70.0«	323.1
P1.027	41.58	12.67	13.862	1.789	0.0	0.0	0.0	0.99	69.9«	323.1
P1.028	39.34	14.12	13.709	1.789	0.0	0.0	0.0	0.99	69.6«	323.1

Manhole Schedules for SW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
Roof D2	21.411	0.920	Open Manhole	1200	P1.000	20.491	225				
Roof D2	21.411	0.940	Open Manhole	1200	P1.001	20.471	225	P1.000	20.471	225	
Roof D1	21.411	0.900	Open Manhole	1200	P2.000	20.511	225				
Roof D1	21.411	0.920	Open Manhole	1200	P2.001	20.491	225	P2.000	20.491	225	
S27	21.295	0.920	Open Manhole	1200	P1.002	20.375	225	P1.001	20.375	225	
								P2.001	20.375	225	
S26	21.642	1.394	Open Manhole	1200	P1.003	20.248	225	P1.002	20.248	225	
S25	21.331	1.211	Open Manhole	1200	P1.004	20.120	225	P1.003	20.120	225	
S24	21.102	1.067	Open Manhole	1200	P1.005	20.035	225	P1.004	20.035	225	
S23	21.050	1.016	Open Manhole	1200	P1.006	20.034	225	P1.005	20.034	225	
S22	21.100	1.524	Open Manhole	1200	P1.007	19.576	225	P1.006	19.576	225	
S21	20.783	1.477	Open Manhole	1200	P1.008	19.306	225	P1.007	19.306	225	
S20-4	21.800	2.105	Open Manhole	1200	P3.000	19.695	225				
S20-3	20.919	1.344	Open Manhole	1200	P3.001	19.575	225	P3.000	19.575	225	
S20-2	20.958	1.482	Open Manhole	1200	P3.002	19.476	225	P3.001	19.476	225	
S20-1	21.000	1.678	Open Manhole	1200	P3.003	19.322	225	P3.002	19.322	225	
Podium B	21.000	2.050	Open Manhole	1200	P4.000	18.950	300				
Podium B	21.000	2.057	Open Manhole	1200	P4.001	18.943	300	P4.000	18.943	300	
Roof B1	20.900	2.118	Open Manhole	1200	P5.000	18.782	300				
Roof B1	20.900	2.124	Open Manhole	1200	P5.001	18.776	300	P5.000	18.776	300	
S20	20.890	2.146	Open Manhole	1200	P1.009	18.744	300	P1.008	19.225	225	406

Manhole Schedules for SW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								P3.003	18.809	225	
								P4.001	18.744	300	
								P5.001	18.744	300	
S19-1	20.900	1.425	Open Manhole	1200	P6.000	19.475	225				
Roof B2	20.900	2.140	Open Manhole	1200	P7.000	18.760	225				
Roof B2	20.900	2.152	Open Manhole	1200	P7.001	18.748	225	P7.000	18.748	225	
S19	20.856	2.300	Open Manhole	1350	P1.010	18.556	375	P1.009	18.631	300	
								P6.000	18.930	225	224
								P7.001	18.706	225	
S18	20.780	2.306	Open Manhole	1350	P1.011	18.474	375	P1.010	18.474	375	
S17	20.950	2.531	Open Manhole	1350	P1.012	18.419	375	P1.011	18.419	375	
Roof F2	21.800	1.229	Open Manhole	1200	P8.000	20.571	225				
Roof F2	21.800	1.254	Open Manhole	1200	P8.001	20.546	225	P8.000	20.546	225	
S16-5	21.800	1.325	Open Manhole	1200	P8.002	20.475	225	P8.001	20.475	225	
S16-4	21.900	1.795	Open Manhole	1200	P8.003	20.105	225	P8.002	20.105	225	
S16-3	22.500	2.765	Open Manhole	1200	P8.004	19.735	225	P8.003	19.856	225	121
Roof F1	21.900	2.293	Open Manhole	1200	P9.000	19.607	225				
Roof F1	21.900	2.344	Open Manhole	1200	P9.001	19.556	225	P9.000	19.556	225	
S16-2	22.950	3.477	Open Manhole	1200	P8.005	19.473	225	P8.004	19.473	225	
								P9.001	19.473	225	
S16-1-1	21.300	1.825	Open Manhole	1200	P10.000	19.475	225				

Manhole Schedules for SW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S16-1	21.441	2.919	Open Manhole	1350	P8.006	18.522	375	P8.005	18.672	225	
								P10.000	19.096	225	424
S16	21.100	2.735	Open Manhole	1350	P1.013	18.365	375	P1.012	18.365	375	
								P8.006	18.365	375	
S15	20.946	2.619	Open Manhole	1350	P1.014	18.327	375	P1.013	18.327	375	
Roof A1	20.800	2.208	Open Manhole	1200	P11.000	18.592	225				
Roof A1	20.800	2.251	Open Manhole	1200	P11.001	18.549	225	P11.000	18.549	225	
S14	20.600	2.343	Open Manhole	1350	P1.015	18.257	375	P1.014	18.257	375	
								P11.001	18.407	225	
S13	19.400	2.082	Open Manhole	1350	P1.016	17.318	375	P1.015	17.318	375	
Roof A3	19.700	2.347	Open Manhole	1200	P12.000	17.353	225				
Roof A3	19.700	2.386	Open Manhole	1200	P12.001	17.314	225	P12.000	17.314	225	
S12	19.054	2.024	Open Manhole	1350	P1.017	17.030	375	P1.016	17.030	375	
								P12.001	17.180	225	
Roof C1	21.200	1.481	Open Manhole	1200	P13.000	19.719	225				
Roof C1	21.200	1.510	Open Manhole	1200	P13.001	19.690	225	P13.000	19.690	225	
S11-13	21.020	1.445	Open Manhole	1200	P13.002	19.575	225	P13.001	19.575	225	
Roof C2	21.200	2.076	Open Manhole	1200	P14.000	19.124	225				
Roof C2	21.200	2.105	Open Manhole	1200	P14.001	19.095	225	P14.000	19.095	225	
S11-12	20.650	1.644	Open Manhole	1200	P13.003	19.006	225	P13.002	19.006	225	
								P14.001	19.006	225	

Manhole Schedules for SW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
Roof C3	21.200	2.916	Open Manhole	1200	P15.000	18.284	225				
Roof C3	21.200	2.942	Open Manhole	1200	P15.001	18.258	225	P15.000	18.258	225	
Roof C4	21.200	2.916	Open Manhole	1200	P16.000	18.284	225				
Roof C4	21.200	2.949	Open Manhole	1200	P16.001	18.251	225	P16.000	18.251	225	
S11-11	19.950	1.810	Open Manhole	1200	P13.004	18.140	225	P13.003	18.142	225	2
								P15.001	18.140	225	
								P16.001	18.140	225	
Podium C	21.200	3.727	Open Manhole	1200	P17.000	17.473	225				
Podium C	21.200	3.752	Open Manhole	1200	P17.001	17.448	225	P17.000	17.448	225	
Roof C5	21.200	3.712	Open Manhole	1200	P18.000	17.488	225				
Roof C5	21.200	3.740	Open Manhole	1200	P18.001	17.460	225	P18.000	17.460	225	
S11-10	19.175	1.858	Open Manhole	1200	P13.005	17.317	300	P13.004	17.392	225	
								P17.001	17.394	225	2
								P18.001	17.392	225	
Roof C7	21.200	4.418	Open Manhole	1200	P19.000	16.782	300				
Roof C7	21.200	4.434	Open Manhole	1200	P19.001	16.766	300	P19.000	16.766	300	
S11-9	18.885	2.174	Open Manhole	1200	P13.006	16.711	300	P13.005	16.711	300	
								P19.001	16.711	300	
Roof B3	20.530	3.332	Open Manhole	1200	P20.000	17.198	225				
Roof B3	20.530	3.449	Open Manhole	1200	P20.001	17.081	300	P20.000	17.156	225	
67	20.530	3.586	Open Manhole	1350	P20.002	16.944	375	P20.001	17.018	300	

Manhole Schedules for SW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
Roof B4	19.875	2.874	Open Manhole	1350	P21.000	17.001	375				
Roof B4	19.875	2.882	Open Manhole	1350	P21.001	16.993	375	P21.000	16.993	375	
68	19.875	3.050	Open Manhole	1350	P20.003	16.825	375	P20.002	16.825	375	
								P21.001	16.825	375	
S11-8-A	18.880	2.200	Open Manhole	1350	P20.004	16.680	375	P20.003	16.680	375	
Roof A2	18.600	1.561	Open Manhole	1200	P22.000	17.039	225				
Roof A2	18.600	1.660	Open Manhole	1200	P22.001	16.940	300	P22.000	17.015	225	
S11-8-2	18.800	2.000	Open Manhole	1200	P22.002	16.800	300	P22.001	16.800	300	
Podium A	18.800	2.135	Open Manhole	1350	P23.000	16.665	450				
Podium A	18.800	2.208	Open Manhole	1350	P23.001	16.592	375	P23.000	16.592	450	
S11-8-1-1	18.800	2.244	Open Manhole	1350	P23.002	16.556	375	P23.001	16.556	375	
S11-8-1	18.800	2.277	Open Manhole	1350	P22.003	16.523	375	P22.002	16.598	300	
								P23.002	16.523	375	
S11-8	18.800	2.357	Open Manhole	1350	P13.007	16.443	375	P13.006	16.564	300	46
								P20.004	16.614	375	171
								P22.003	16.443	375	
Roof A7	18.600	2.024	Open Manhole	1200	P24.000	16.576	225				
Roof A7	18.600	2.043	Open Manhole	1200	P24.001	16.557	225	P24.000	16.557	225	
S11-7	18.800	2.502	Open Manhole	1350	P13.008	16.298	450	P13.007	16.373	375	
								P24.001	16.523	225	
S11-6-1	18.380	1.425	Open Manhole	1200	P25.000	16.955	225				

Manhole Schedules for SW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S11-6	18.550	2.341	Open Manhole	1350	P13.009	16.209	450	P13.008	16.209	450	
								P25.000	16.803	225	369
S11-5	18.476	2.301	Open Manhole	1350	P13.010	16.175	450	P13.009	16.175	450	
Roof A6	18.600	2.215	Open Manhole	1200	P26.000	16.385	225				
Roof A6	18.600	2.246	Open Manhole	1200	P26.001	16.354	225	P26.000	16.354	225	
S11-4	18.080	2.004	Open Manhole	1350	P13.011	16.076	450	P13.010	16.076	450	
								P26.001	16.301	225	
S11-3	18.094	2.054	Open Manhole	1350	P13.012	16.040	450	P13.011	16.040	450	
Roof A5	18.600	2.544	Open Manhole	1350	P27.000	16.056	450				
Roof A5	18.600	2.580	Open Manhole	1350	P27.001	16.020	450	P27.000	16.020	450	
S11-2	17.994	2.056	Open Manhole	1350	P13.013	15.938	450	P13.012	15.938	450	
								P27.001	15.938	450	
Roof A4	18.600	2.530	Open Manhole	1200	P28.000	16.070	225				
Roof A4	18.600	2.556	Open Manhole	1200	P28.001	16.044	225	P28.000	16.044	225	
S11-1	18.600	2.845	Open Manhole	1350	P13.014	15.755	450	P13.013	15.755	450	
								P28.001	15.980	225	
S11	18.600	2.881	Open Manhole	1350	P1.018	15.720	450	P1.017	16.706	375	911
								P13.014	15.719	450	
S10	18.632	3.016	Open Manhole	1350	P1.019	15.616	300	P1.018	15.616	450	
S9	18.709	3.120	Open Manhole	1200	P1.020	15.589	300	P1.019	15.589	300	
S8	19.024	3.570	Open Manhole	1200	P1.021	15.454	300	P1.020	15.454	300	

Manhole Schedules for SW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S7	18.716	3.393	Open Manhole	1200	P1.022	15.323	300	P1.021	15.323	300	
S6	18.520	3.318	Open Manhole	1200	P1.023	15.202	300	P1.022	15.202	300	
S5	18.314	3.194	Open Manhole	1200	P1.024	15.120	300	P1.023	15.120	300	
S4	18.333	4.183	Open Manhole	1200	P1.025	14.150	300	P1.024	15.019	300	869
S3	17.613	3.604	Open Manhole	1200	P1.026	14.009	300	P1.025	14.009	300	
S2	16.667	2.805	Open Manhole	1200	P1.027	13.862	300	P1.026	13.862	300	
S1	15.660	1.951	Open Manhole	1200	P1.028	13.709	300	P1.027	13.709	300	
S0	15.660	2.291	Open Manhole	300		OUTFALL		P1.028	13.369	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Roof D2	716869.764	731176.533	716869.764	731176.533	Required	
Roof D2	716869.349	731175.405	716869.349	731175.405	Required	
Roof D1	716873.439	731174.987	716873.439	731174.987	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Roof D1	716872.855	731173.914	716872.855	731173.914	Required	
S27	716867.028	731170.131	716867.028	731170.131	Required	
S26	716846.931	731177.984	716846.931	731177.984	Required	
S25	716850.689	731199.459	716850.689	731199.459	Required	
S24	716853.613	731213.561	716853.613	731213.561	Required	
S23	716858.721	731216.264	716858.721	731216.264	Required	
S22	716873.297	731204.234	716873.297	731204.234	Required	
S21	716895.979	731194.128	716895.979	731194.128	Required	
S20-4	716887.902	731119.969	716887.902	731119.969	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S20-3	716893.020	731133.087	716893.020	731133.087	Required	
S20-2	716889.088	731134.617	716889.088	731134.617	Required	
S20-1	716885.202	731144.716	716885.202	731144.716	Required	
Podium B	716909.283	731208.703	716909.283	731208.703	Required	
Podium B	716908.911	731208.073	716908.911	731208.073	Required	
Roof B1	716909.635	731194.499	716909.635	731194.499	Required	
Roof B1	716909.038	731193.301	716909.038	731193.301	Required	
S20	716902.572	731189.182	716902.572	731189.182	Required	
S19-1	716910.147	731152.806	716910.147	731152.806	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Roof B2	716925.602	731188.758	716925.602	731188.758	Required	
Roof B2	716924.697	731187.123	716924.697	731187.123	Required	
S19	716921.987	731181.517	716921.987	731181.517	Required	
S18	716942.641	731173.919	716942.641	731173.919	Required	
S17	716947.016	731157.858	716947.016	731157.858	Required	
Roof F2	716896.162	731112.315	716896.162	731112.315	Required	
Roof F2	716895.587	731110.950	716895.587	731110.950	Required	
S16-5	716894.477	731106.824	716894.477	731106.824	Required	
S16-4	716915.241	731098.937	716915.241	731098.937	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S16-3	716907.676	731080.212	716907.676	731080.212	Required	
Roof F1	716925.660	731078.131	716925.660	731078.131	Required	
Roof F1	716926.880	731075.332	716926.880	731075.332	Required	
S16-2	716930.157	731071.573	716930.157	731071.573	Required	
S16-1-1	716922.061	731128.072	716922.061	731128.072	Required	
S16-1	716947.522	731117.646	716947.522	731117.646	Required	
S16	716959.336	731148.157	716959.336	731148.157	Required	
S15	716970.690	731151.309	716970.690	731151.309	Required	
Roof A1	716976.303	731169.940	716976.303	731169.940	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Roof A1	716978.632	731169.053	716978.632	731169.053	Required	
S14	716986.188	731165.566	716986.188	731165.566	Required	
S13	717003.892	731215.082	717003.892	731215.082	Required	
Roof A3	717011.201	731230.393	717011.201	731230.393	Required	
Roof A3	717012.843	731228.695	717012.843	731228.695	Required	
S12	717018.660	731223.161	717018.660	731223.161	Required	
Roof C1	716884.400	731219.343	716884.400	731219.343	Required	
Roof C1	716882.842	731220.118	716882.842	731220.118	Required	
S11-13	716876.241	731222.119	716876.241	731222.119	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Roof C2	716894.102	731264.658	716894.102	731264.658	Required	
Roof C2	716892.413	731265.160	716892.413	731265.160	Required	
S11-12	716887.229	731266.495	716887.229	731266.495	Required	
Roof C3	716905.231	731293.863	716905.231	731293.863	Required	
Roof C3	716903.824	731294.505	716903.824	731294.505	Required	
Roof C4	716906.339	731294.986	716906.339	731294.986	Required	
Roof C4	716904.523	731295.729	716904.523	731295.729	Required	
S11-11	716899.663	731300.142	716899.663	731300.142	Required	
Podium C	716935.582	731280.677	716935.582	731280.677	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Podium C	716936.315	731282.184	716936.315	731282.184	Required	
Roof C5	716933.009	731283.233	716933.009	731283.233	Required	
Roof C5	716933.665	731284.759	716933.665	731284.759	Required	
S11-10	716937.578	731285.162	716937.578	731285.162	Required	
Roof C7	716969.375	731268.066	716969.375	731268.066	Required	
Roof C7	716969.846	731268.898	716969.846	731268.898	Required	
S11-9	716971.065	731271.942	716971.065	731271.942	Required	
Roof B3	716949.150	731196.592	716949.150	731196.592	Required	
Roof B3	716951.502	731195.757	716951.502	731195.757	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
67	716954.886	731194.086	716954.886	731194.086	Required	
Roof B4	716962.278	731228.083	716962.278	731228.083	Required	
Roof B4	716964.175	731227.172	716964.175	731227.172	Required	
68	716968.321	731224.525	716968.321	731224.525	Required	
S11-8-A	716984.264	731261.873	716984.264	731261.873	Required	
Roof A2	717021.317	731263.328	717021.317	731263.328	Required	
Roof A2	717020.370	731264.343	717020.370	731264.343	Required	
S11-8-2	717013.322	731268.550	717013.322	731268.550	Required	
Podium A	716992.236	731250.198	716992.236	731250.198	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Podium A	716997.866	731254.847	716997.866	731254.847	Required	
S11-8-1-1	717000.532	731257.241	717000.532	731257.241	Required	
S11-8-1	717002.951	731259.469	717002.951	731259.469	Required	
S11-8	716991.128	731271.563	716991.128	731271.563	Required	
Roof A7	717008.889	731284.470	717008.889	731284.470	Required	
Roof A7	717007.693	731285.994	717007.693	731285.994	Required	
S11-7	717005.654	731288.682	717005.654	731288.682	Required	
S11-6-1	717024.359	731339.707	717024.359	731339.707	Required	
S11-6	717014.778	731318.566	717014.778	731318.566	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S11-5	717023.146	731313.948	717023.146	731313.948	Required	
Roof A6	717038.349	731290.589	717038.349	731290.589	Required	
Roof A6	717039.769	731291.786	717039.769	731291.786	Required	
S11-4	717042.169	731293.908	717042.169	731293.908	Required	
S11-3	717053.471	731295.422	717053.471	731295.422	Required	
Roof A5	717064.799	731278.307	717064.799	731278.307	Required	
Roof A5	717065.932	731276.935	717065.932	731276.935	Required	
S11-2	717069.858	731275.808	717069.858	731275.808	Required	
Roof A4	717032.505	731250.592	717032.505	731250.592	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Roof A4	717033.473	731249.394	717033.473	731249.394	Required	
S11-1	717035.822	731246.334	717035.822	731246.334	Required	
S11	717031.827	731234.985	717031.827	731234.985	Required	
S10	717041.658	731224.784	717041.658	731224.784	Required	
S9	717047.913	731222.520	717047.913	731222.520	Required	
S8	717065.774	731204.449	717065.774	731204.449	Required	
S7	717086.156	731225.987	717086.156	731225.987	Required	
S6	717105.698	731248.576	717105.698	731248.576	Required	
S5	717122.403	731259.818	717122.403	731259.818	Required	

Manhole Schedules for SW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S4	717140.475	731242.588	717140.475	731242.588	Required	
S3	717175.251	731244.689	717175.251	731244.689	Required	
S2	717211.918	731243.323	717211.918	731243.323	Required	
S1	717250.267	731243.218	717250.267	731243.218	Required	
S0	717336.047	731242.963			No Entry	

PIPELINE SCHEDULES for SW_1

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)
P1.000	o	225	Roof D2	21.411	20.491	0.695	Open Manhole	1200
P1.001	o	225	Roof D2	21.411	20.471	0.715	Open Manhole	1200
P2.000	o	225	Roof D1	21.411	20.511	0.675	Open Manhole	1200
P2.001	o	225	Roof D1	21.411	20.491	0.695	Open Manhole	1200
P1.002	o	225	S27	21.295	20.375	0.695	Open Manhole	1200
P1.003	o	225	S26	21.642	20.248	1.169	Open Manhole	1200
P1.004	o	225	S25	21.331	20.120	0.986	Open Manhole	1200
P1.005	o	225	S24	21.102	20.035	0.842	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)
P1.000	1.202	60.1	Roof D2	21.411	20.471	0.715	Open Manhole	1200
P1.001	5.762	60.0	S27	21.295	20.375	0.695	Open Manhole	1200
P2.000	1.221	61.1	Roof D1	21.411	20.491	0.695	Open Manhole	1200
P2.001	6.947	59.9	S27	21.295	20.375	0.695	Open Manhole	1200
P1.002	21.577	169.9	S26	21.642	20.248	1.169	Open Manhole	1200
P1.003	21.801	170.3	S25	21.331	20.120	0.986	Open Manhole	1200
P1.004	14.402	169.4	S24	21.102	20.035	0.842	Open Manhole	1200
P1.005	5.779	5779.0	S23	21.050	20.034	0.791	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P1.006	o	225	S23	21.050	20.034	0.791	Open Manhole	1200
P1.007	o	225	S22	21.100	19.576	1.299	Open Manhole	1200
P1.008	o	225	S21	20.783	19.306	1.252	Open Manhole	1200
P3.000	o	225	S20-4	21.800	19.695	1.880	Open Manhole	1200
P3.001	o	225	S20-3	20.919	19.575	1.119	Open Manhole	1200
P3.002	o	225	S20-2	20.958	19.476	1.257	Open Manhole	1200
P3.003	o	225	S20-1	21.000	19.322	1.453	Open Manhole	1200
P4.000	o	300	Podium B	21.000	18.950	1.750	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)
P1.006	18.900	41.3	S22	21.100	19.576	1.299	Open Manhole	1200
P1.007	24.832	92.0	S21	20.783	19.306	1.252	Open Manhole	1200
P1.008	8.243	101.8	S20	20.890	19.225	1.440	Open Manhole	1200
P3.000	14.082	117.4	S20-3	20.919	19.575	1.119	Open Manhole	1200
P3.001	4.220	42.6	S20-2	20.958	19.476	1.257	Open Manhole	1200
P3.002	10.820	70.3	S20-1	21.000	19.322	1.453	Open Manhole	1200
P3.003	47.738	93.0	S20	20.890	18.809	1.856	Open Manhole	1200
P4.000	0.732	104.6	Podium B	21.000	18.943	1.757	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P4.001	o	300	Podium B	21.000	18.943	1.757	Open Manhole	1200
P5.000	o	300	Roof B1	20.900	18.782	1.818	Open Manhole	1200
P5.001	o	300	Roof B1	20.900	18.776	1.824	Open Manhole	1200
P1.009	o	300	S20	20.890	18.744	1.846	Open Manhole	1200
P6.000	o	225	S19-1	20.900	19.475	1.200	Open Manhole	1200
P7.000	o	225	Roof B2	20.900	18.760	1.915	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)
P4.001	19.926	100.1	S20	20.890	18.744	1.846	Open Manhole	1200
P5.000	1.339	223.2	Roof B1	20.900	18.776	1.824	Open Manhole	1200
P5.001	7.667	239.6	S20	20.890	18.744	1.846	Open Manhole	1200
P1.009	20.873	184.7	S19	20.856	18.631	1.925	Open Manhole	1350
P6.000	31.056	57.0	S19	20.856	18.930	1.701	Open Manhole	1350
P7.000	1.869	155.8	Roof B2	20.900	18.748	1.927	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P7.001	o	225	Roof B2	20.900	18.748	1.927	Open Manhole	1200
P1.010	o	375	S19	20.856	18.556	1.925	Open Manhole	1350
P1.011	o	375	S18	20.780	18.474	1.931	Open Manhole	1350
P1.012	o	375	S17	20.950	18.419	2.156	Open Manhole	1350
P8.000	o	225	Roof F2	21.800	20.571	1.004	Open Manhole	1200
P8.001	o	225	Roof F2	21.800	20.546	1.029	Open Manhole	1200
P8.002	o	225	S16-5	21.800	20.475	1.100	Open Manhole	1200
P8.003	o	225	S16-4	21.900	20.105	1.570	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)
P7.001	6.226	148.2	S19	20.856	18.706	1.925	Open Manhole	1350
P1.010	22.007	268.4	S18	20.780	18.474	1.931	Open Manhole	1350
P1.011	16.646	302.7	S17	20.950	18.419	2.156	Open Manhole	1350
P1.012	15.681	290.4	S16	21.100	18.365	2.360	Open Manhole	1350
P8.000	1.481	59.2	Roof F2	21.800	20.546	1.029	Open Manhole	1200
P8.001	4.273	60.2	S16-5	21.800	20.475	1.100	Open Manhole	1200
P8.002	22.212	60.0	S16-4	21.900	20.105	1.570	Open Manhole	1200
P8.003	20.196	81.1	S16-3	22.500	19.856	2.419	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P8.004	o	225	S16-3	22.500	19.735	2.540	Open Manhole	1200
P9.000	o	225	Roof F1	21.900	19.607	2.068	Open Manhole	1200
P9.001	o	225	Roof F1	21.900	19.556	2.119	Open Manhole	1200
P8.005	o	225	S16-2	22.950	19.473	3.252	Open Manhole	1200
P10.000	o	225	S16-1-1	21.300	19.475	1.600	Open Manhole	1200
P8.006	o	375	S16-1	21.441	18.522	2.544	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)
P8.004	24.084	91.9	S16-2	22.950	19.473	3.252	Open Manhole	1200
P9.000	3.053	59.9	Roof F1	21.900	19.556	2.119	Open Manhole	1200
P9.001	4.987	60.1	S16-2	22.950	19.473	3.252	Open Manhole	1200
P8.005	49.237	61.5	S16-1	21.441	18.672	2.544	Open Manhole	1350
P10.000	27.514	72.6	S16-1	21.441	19.096	2.120	Open Manhole	1350
P8.006	32.718	208.4	S16	21.100	18.365	2.360	Open Manhole	1350

PIPELINE SCHEDULES for SW_1

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)
P1.013	o	375	S16	21.100	18.365	2.360	Open Manhole	1350
P1.014	o	375	S15	20.946	18.327	2.244	Open Manhole	1350
P11.000	o	225	Roof A1	20.800	18.592	1.983	Open Manhole	1200
P11.001	o	225	Roof A1	20.800	18.549	2.026	Open Manhole	1200
P1.015	o	375	S14	20.600	18.257	1.968	Open Manhole	1350
P1.016	o	375	S13	19.400	17.318	1.707	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)
P1.013	11.784	310.1	S15	20.946	18.327	2.244	Open Manhole	1350
P1.014	21.058	300.8	S14	20.600	18.257	1.968	Open Manhole	1350
P11.000	2.492	58.0	Roof A1	20.800	18.549	2.026	Open Manhole	1200
P11.001	8.322	58.6	S14	20.600	18.407	1.968	Open Manhole	1350
P1.015	52.586	56.0	S13	19.400	17.318	1.707	Open Manhole	1350
P1.016	16.834	58.5	S12	19.054	17.030	1.649	Open Manhole	1350

PIPELINE SCHEDULES for SW_1

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)
P12.000	o	225	Roof A3	19.700	17.353	2.122	Open Manhole	1200
P12.001	o	225	Roof A3	19.700	17.314	2.161	Open Manhole	1200
P1.017	o	375	S12	19.054	17.030	1.649	Open Manhole	1350
P13.000	o	225	Roof C1	21.200	19.719	1.256	Open Manhole	1200
P13.001	o	225	Roof C1	21.200	19.690	1.285	Open Manhole	1200
P13.002	o	225	S11-13	21.020	19.575	1.220	Open Manhole	1200
P14.000	o	225	Roof C2	21.200	19.124	1.851	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)
P12.000	2.362	60.6	Roof A3	19.700	17.314	2.161	Open Manhole	1200
P12.001	8.029	59.9	S12	19.054	17.180	1.649	Open Manhole	1350
P1.017	17.696	54.7	S11	18.600	16.706	1.519	Open Manhole	1350
P13.000	1.741	60.0	Roof C1	21.200	19.690	1.285	Open Manhole	1200
P13.001	6.897	60.0	S11-13	21.020	19.575	1.220	Open Manhole	1200
P13.002	45.715	80.3	S11-12	20.650	19.006	1.419	Open Manhole	1200
P14.000	1.763	60.8	Roof C2	21.200	19.095	1.880	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P14.001	o	225	Roof C2	21.200	19.095	1.880	Open Manhole	1200
P13.003	o	225	S11-12	20.650	19.006	1.419	Open Manhole	1200
P15.000	o	225	Roof C3	21.200	18.284	2.691	Open Manhole	1200
P15.001	o	225	Roof C3	21.200	18.258	2.717	Open Manhole	1200
P16.000	o	225	Roof C4	21.200	18.284	2.691	Open Manhole	1200
P16.001	o	225	Roof C4	21.200	18.251	2.724	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)
P14.001	5.353	60.1	S11-12	20.650	19.006	1.419	Open Manhole	1200
P13.003	35.871	41.5	S11-11	19.950	18.142	1.583	Open Manhole	1200
P15.000	1.547	59.5	Roof C3	21.200	18.258	2.717	Open Manhole	1200
P15.001	7.006	59.4	S11-11	19.950	18.140	1.585	Open Manhole	1200
P16.000	1.963	59.5	Roof C4	21.200	18.251	2.724	Open Manhole	1200
P16.001	6.564	59.1	S11-11	19.950	18.140	1.585	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P13.004	o	225	S11-11	19.950	18.140	1.585	Open Manhole	1200
P17.000	o	225	Podium C	21.200	17.473	3.502	Open Manhole	1200
P17.001	o	225	Podium C	21.200	17.448	3.527	Open Manhole	1200
P18.000	o	225	Roof C5	21.200	17.488	3.487	Open Manhole	1200
P18.001	o	225	Roof C5	21.200	17.460	3.515	Open Manhole	1200
P13.005	o	300	S11-10	19.175	17.317	1.558	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)
P13.004	40.766	54.5	S11-10	19.175	17.392	1.558	Open Manhole	1200
P17.000	1.675	67.0	Podium C	21.200	17.448	3.527	Open Manhole	1200
P17.001	3.235	59.9	S11-10	19.175	17.394	1.556	Open Manhole	1200
P18.000	1.661	59.3	Roof C5	21.200	17.460	3.515	Open Manhole	1200
P18.001	3.933	57.8	S11-10	19.175	17.392	1.558	Open Manhole	1200
P13.005	36.003	59.4	S11-9	18.885	16.711	1.874	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P19.000	o	300	Roof C7	21.200	16.782	4.118	Open Manhole	1200
P19.001	o	300	Roof C7	21.200	16.766	4.134	Open Manhole	1200
P13.006	o	300	S11-9	18.885	16.711	1.874	Open Manhole	1200
P20.000	o	225	Roof B3	20.530	17.198	3.107	Open Manhole	1200
P20.001	o	300	Roof B3	20.530	17.081	3.149	Open Manhole	1200
P20.002	o	375	67	20.530	16.944	3.211	Open Manhole	1350
P21.000	o	375	Roof B4	19.875	17.001	2.499	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)
P19.000	0.956	59.8	Roof C7	21.200	16.766	4.134	Open Manhole	1200
P19.001	3.279	59.6	S11-9	18.885	16.711	1.874	Open Manhole	1200
P13.006	20.066	136.5	S11-8	18.800	16.564	1.936	Open Manhole	1350
P20.000	2.496	59.4	Roof B3	20.530	17.156	3.149	Open Manhole	1200
P20.001	3.774	59.9	67	20.530	17.018	3.212	Open Manhole	1350
P20.002	33.271	279.6	68	19.875	16.825	2.675	Open Manhole	1350
P21.000	2.104	263.0	Roof B4	19.875	16.993	2.507	Open Manhole	1350

PIPELINE SCHEDULES for SW_1

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)
P21.001	o	375	Roof B4	19.875	16.993	2.507	Open Manhole	1350
P20.003	o	375	68	19.875	16.825	2.675	Open Manhole	1350
P20.004	o	375	S11-8-A	18.880	16.680	1.825	Open Manhole	1350
P22.000	o	225	Roof A2	18.600	17.039	1.336	Open Manhole	1200
P22.001	o	300	Roof A2	18.600	16.940	1.360	Open Manhole	1200
P22.002	o	300	S11-8-2	18.800	16.800	1.700	Open Manhole	1200
P23.000	o	450	Podium A	18.800	16.665	1.685	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)
P21.001	4.919	29.3	68	19.875	16.825	2.675	Open Manhole	1350
P20.003	40.609	280.0	S11-8-A	18.880	16.680	1.825	Open Manhole	1350
P20.004	11.875	179.9	S11-8	18.800	16.614	1.811	Open Manhole	1350
P22.000	1.388	57.8	Roof A2	18.600	17.015	1.360	Open Manhole	1200
P22.001	8.208	58.6	S11-8-2	18.800	16.800	1.700	Open Manhole	1200
P22.002	13.785	68.2	S11-8-1	18.800	16.598	1.902	Open Manhole	1350
P23.000	7.302	100.0	Podium A	18.800	16.592	1.758	Open Manhole	1350

PIPELINE SCHEDULES for SW_1

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)
P23.001	o	375	Podium A	18.800	16.592	1.833	Open Manhole	1350
P23.002	o	375	S11-8-1-1	18.800	16.556	1.869	Open Manhole	1350
P22.003	o	375	S11-8-1	18.800	16.523	1.902	Open Manhole	1350
P13.007	o	375	S11-8	18.800	16.443	1.982	Open Manhole	1350
P24.000	o	225	Roof A7	18.600	16.576	1.799	Open Manhole	1200
P24.001	o	225	Roof A7	18.600	16.557	1.818	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)
P23.001	3.583	99.5	S11-8-1-1	18.800	16.556	1.869	Open Manhole	1350
P23.002	3.288	100.0	S11-8-1	18.800	16.523	1.902	Open Manhole	1350
P22.003	16.913	211.4	S11-8	18.800	16.443	1.982	Open Manhole	1350
P13.007	22.451	320.7	S11-7	18.800	16.373	2.052	Open Manhole	1350
P24.000	1.938	102.0	Roof A7	18.600	16.557	1.818	Open Manhole	1200
P24.001	3.374	99.2	S11-7	18.800	16.523	2.052	Open Manhole	1350

PIPELINE SCHEDULES for SW_1

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)
P13.008	o	450	S11-7	18.800	16.298	2.052	Open Manhole	1350
P25.000	o	225	S11-6-1	18.380	16.955	1.200	Open Manhole	1200
P13.009	o	450	S11-6	18.550	16.209	1.891	Open Manhole	1350
P13.010	o	450	S11-5	18.476	16.175	1.851	Open Manhole	1350
P26.000	o	225	Roof A6	18.600	16.385	1.990	Open Manhole	1200
P26.001	o	225	Roof A6	18.600	16.354	2.021	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)
P13.008	31.246	351.1	S11-6	18.550	16.209	1.891	Open Manhole	1350
P25.000	23.211	153.0	S11-6	18.550	16.803	1.522	Open Manhole	1350
P13.009	9.558	281.1	S11-5	18.476	16.175	1.851	Open Manhole	1350
P13.010	27.632	279.1	S11-4	18.080	16.076	1.554	Open Manhole	1350
P26.000	1.857	59.9	Roof A6	18.600	16.354	2.021	Open Manhole	1200
P26.001	3.203	60.4	S11-4	18.080	16.301	1.554	Open Manhole	1350

PIPELINE SCHEDULES for SW_1

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)
P13.011	o	450	S11-4	18.080	16.076	1.554	Open Manhole	1350
P13.012	o	450	S11-3	18.094	16.040	1.604	Open Manhole	1350
P27.000	o	450	Roof A5	18.600	16.056	2.094	Open Manhole	1350
P27.001	o	450	Roof A5	18.600	16.020	2.130	Open Manhole	1350
P13.013	o	450	S11-2	17.994	15.938	1.606	Open Manhole	1350
P28.000	o	225	Roof A4	18.600	16.070	2.305	Open Manhole	1200
P28.001	o	225	Roof A4	18.600	16.044	2.331	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)
P13.011	11.403	316.8	S11-3	18.094	16.040	1.604	Open Manhole	1350
P13.012	25.558	250.6	S11-2	17.994	15.938	1.606	Open Manhole	1350
P27.000	1.779	49.4	Roof A5	18.600	16.020	2.130	Open Manhole	1350
P27.001	4.085	49.8	S11-2	17.994	15.938	1.606	Open Manhole	1350
P13.013	45.024	246.0	S11-1	18.600	15.755	2.395	Open Manhole	1350
P28.000	1.540	59.2	Roof A4	18.600	16.044	2.331	Open Manhole	1200
P28.001	3.858	60.3	S11-1	18.600	15.980	2.395	Open Manhole	1350

PIPELINE SCHEDULES for SW_1

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)
P13.014	o	450	S11-1	18.600	15.755	2.395	Open Manhole	1350
P1.018	o	450	S11	18.600	15.720	2.430	Open Manhole	1350
P1.019	o	300	S10	18.632	15.616	2.716	Open Manhole	1350
P1.020	o	300	S9	18.709	15.589	2.820	Open Manhole	1200
P1.021	o	300	S8	19.024	15.454	3.270	Open Manhole	1200
P1.022	o	300	S7	18.716	15.323	3.093	Open Manhole	1200
P1.023	o	300	S6	18.520	15.202	3.018	Open Manhole	1200
P1.024	o	300	S5	18.314	15.120	2.894	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)
P13.014	12.031	334.2	S11	18.600	15.719	2.431	Open Manhole	1350
P1.018	14.167	136.2	S10	18.632	15.616	2.566	Open Manhole	1350
P1.019	6.652	246.4	S9	18.709	15.589	2.820	Open Manhole	1200
P1.020	25.408	188.2	S8	19.024	15.454	3.270	Open Manhole	1200
P1.021	29.654	226.4	S7	18.716	15.323	3.093	Open Manhole	1200
P1.022	29.869	246.9	S6	18.520	15.202	3.018	Open Manhole	1200
P1.023	20.136	245.6	S5	18.314	15.120	2.894	Open Manhole	1200
P1.024	24.969	247.2	S4	18.333	15.019	3.014	Open Manhole	1200

PIPELINE SCHEDULES for SW_1

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)
P1.025	o	300	S4	18.333	14.150	3.883	Open Manhole	1200
P1.026	o	300	S3	17.613	14.009	3.304	Open Manhole	1200
P1.027	o	300	S2	16.667	13.862	2.505	Open Manhole	1200
P1.028	o	300	S1	15.660	13.709	1.651	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)
P1.025	34.840	247.1	S3	17.613	14.009	3.304	Open Manhole	1200
P1.026	36.693	249.6	S2	16.667	13.862	2.505	Open Manhole	1200
P1.027	38.349	250.6	S1	15.660	13.709	1.651	Open Manhole	1200
P1.028	85.781	252.3	S0	15.660	13.369	1.991	Open Manhole	300

Free Flowing Outfall Details for SW_1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
P1.028	S0	15.660	13.369	13.368	300	0

Online Controls for SW_1

Depth/Flow Relationship Manhole: Roof D2, DS/PN: P1.001, Volume (m³): 1.1

Invert Level (m) 20.471

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1300	0.049	0.1500	0.065	0.1800	0.068	0.1800
0.030	0.1200	0.041	0.1400	0.057	0.1700	0.067	0.1800		

Depth/Flow Relationship Manhole: Roof D1, DS/PN: P2.001, Volume (m³): 1.0

Invert Level (m) 20.491

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.028	0.2100	0.045	0.2700	0.065	0.3400	0.088	0.3900	0.094	0.4100
0.039	0.2500	0.054	0.3000	0.077	0.3700	0.093	0.4000		

Orifice Manhole: S23, DS/PN: P1.006, Volume (m³): 1.3

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 20.034

Depth/Flow Relationship Manhole: Podium B, DS/PN: P4.001, Volume (m³): 2.3

Invert Level (m) 18.943

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.8700	0.029	1.0400	0.034	1.1300	0.041	1.2600	0.049	1.3900

Depth/Flow Relationship Manhole: Podium B, DS/PN: P4.001, Volume (m³): 2.3

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.059	1.5300	0.069	1.6700	0.074	1.7400	0.081	1.8200		

Depth/Flow Relationship Manhole: Roof B1, DS/PN: P5.001, Volume (m³): 2.4

Invert Level (m) 18.776

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1300	0.048	0.1500	0.065	0.1800	0.070	0.1800
0.029	0.1200	0.040	0.1400	0.057	0.1700	0.068	0.1800		

Depth/Flow Relationship Manhole: Roof B2, DS/PN: P7.001, Volume (m³): 2.5

Invert Level (m) 18.748

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.048	0.1500	0.063	0.1800
0.029	0.1200	0.040	0.1400	0.056	0.1700	0.066	0.1800

Depth/Flow Relationship Manhole: Roof F2, DS/PN: P8.001, Volume (m³): 1.4

Invert Level (m) 20.546

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1500	0.034	0.2000	0.050	0.2400	0.070	0.2900	0.082	0.3100
0.030	0.1800	0.042	0.2200	0.060	0.2600	0.075	0.3000		

Depth/Flow Relationship Manhole: Roof F1, DS/PN: P9.001, Volume (m³): 2.7

Invert Level (m) 19.556

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.029	0.2800	0.046	0.3700	0.067	0.4500	0.090	0.5300
0.040	0.3400	0.056	0.4100	0.079	0.4900	0.095	0.5400

Hydro-Brake® Optimum Manhole: S16, DS/PN: P1.013, Volume (m³): 9.0

Unit Reference	MD-SHE-0107-6400-1795-6400	Sump Available	Yes
Design Head (m)	1.795	Diameter (mm)	107
Design Flow (l/s)	6.4	Invert Level (m)	18.365
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.795	6.4	Kick-Flo®	0.953	4.8
Flush-Flo™	0.467	6.0	Mean Flow over Head Range	-	5.4

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	0.600	5.9	1.600	6.1	2.600	7.6	5.000	10.4	7.500	12.6
0.200	5.3	0.800	5.5	1.800	6.4	3.000	8.1	5.500	10.8	8.000	13.0
0.300	5.8	1.000	4.9	2.000	6.7	3.500	8.7	6.000	11.3	8.500	13.3
0.400	6.0	1.200	5.3	2.200	7.0	4.000	9.3	6.500	11.7	9.000	13.7
0.500	6.0	1.400	5.7	2.400	7.3	4.500	9.9	7.000	12.2	9.500	14.1

Depth/Flow Relationship Manhole: Roof A1, DS/PN: P11.001, Volume (m³): 2.6

Invert Level (m) 18.549

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.031	0.4500	0.050	0.5900	0.072	0.7200	0.094	0.8300
0.043	0.5500	0.060	0.6600	0.084	0.7900	0.096	0.8400

Depth/Flow Relationship Manhole: Roof A3, DS/PN: P12.001, Volume (m³): 2.7

Invert Level (m) 17.314

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.021	0.1000	0.033	0.1200	0.047	0.1500	0.061	0.1700
0.029	0.1100	0.040	0.1400	0.055	0.1600	0.063	0.1800

Depth/Flow Relationship Manhole: Roof C1, DS/PN: P13.001, Volume (m³): 1.7

Invert Level (m) 19.690

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1500	0.035	0.2000	0.051	0.2500	0.071	0.3000	0.085	0.3200
0.030	0.1800	0.042	0.2200	0.061	0.2700	0.077	0.3100		

Depth/Flow Relationship Manhole: Roof C2, DS/PN: P14.001, Volume (m³): 2.4

Invert Level (m) 19.095

Depth/Flow Relationship Manhole: Roof C2, DS/PN: P14.001, Volume (m³): 2.4

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1500	0.034	0.2000	0.049	0.2400	0.070	0.2900	0.084	0.3200
0.029	0.1800	0.041	0.2200	0.059	0.2700	0.076	0.3000	0.085	0.3200

Depth/Flow Relationship Manhole: Roof C3, DS/PN: P15.001, Volume (m³): 3.3

Invert Level (m) 18.258

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.035	0.1300	0.051	0.1600	0.071	0.1900	0.084	0.2000
0.030	0.1200	0.042	0.1400	0.061	0.1700	0.077	0.2000		

Depth/Flow Relationship Manhole: Roof C4, DS/PN: P16.001, Volume (m³): 3.4

Invert Level (m) 18.251

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.047	0.1500	0.060	0.1700
0.029	0.1200	0.040	0.1400	0.055	0.1600	0.061	0.1700

Depth/Flow Relationship Manhole: Podium C, DS/PN: P17.001, Volume (m³): 4.3

Invert Level (m) 17.448

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.049	0.1500	0.068	0.1800	0.079	0.2000
0.029	0.1100	0.041	0.1400	0.058	0.1700	0.073	0.1900		

Depth/Flow Relationship Manhole: Roof C5, DS/PN: P18.001, Volume (m³): 4.2

Invert Level (m) 17.460

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1200	0.034	0.1600	0.049	0.1900	0.068	0.2300	0.080	0.2500
0.029	0.1400	0.041	0.1700	0.058	0.2100	0.074	0.2400		

Depth/Flow Relationship Manhole: Roof C7, DS/PN: P19.001, Volume (m³): 5.0

Invert Level (m) 16.766

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.033	0.1200	0.047	0.1500	0.056	0.1700
0.029	0.1200	0.040	0.1400	0.053	0.1600		

Depth/Flow Relationship Manhole: Roof B3, DS/PN: P20.001, Volume (m³): 4.0

Invert Level (m) 17.156

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.028	0.2800	0.045	0.3600	0.065	0.4400	0.088	0.5200	0.095	0.5400
0.038	0.3300	0.054	0.4000	0.077	0.4800	0.093	0.5300		

Depth/Flow Relationship Manhole: Roof B4, DS/PN: P21.001, Volume (m³): 4.2

Invert Level (m) 16.993

Depth/Flow Relationship Manhole: Roof B4, DS/PN: P21.001, Volume (m³): 4.2

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1300	0.049	0.1500	0.071	0.1900	0.089	0.2100
0.029	0.1200	0.041	0.1400	0.060	0.1700	0.078	0.2000	0.950	0.2200

Depth/Flow Relationship Manhole: Roof A2, DS/PN: P22.001, Volume (m³): 1.9

Invert Level (m) 17.015

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.3000	0.035	0.3900	0.050	0.4800	0.071	0.5800	0.086	0.6400
0.030	0.3600	0.042	0.4400	0.060	0.5300	0.077	0.6100	0.087	0.6500

Depth/Flow Relationship Manhole: Podium A, DS/PN: P23.001, Volume (m³): 4.1

Invert Level (m) 16.592

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.7700	0.034	1.0100	0.050	1.2400	0.069	1.4900	0.082	1.6300
0.030	0.9300	0.041	1.1200	0.059	1.3700	0.075	1.5600		

Non Return Valve Manhole: S11-8-1, DS/PN: P22.003, Volume (m³): 4.4

Hydro-Brake® Optimum Manhole: S11-8, DS/PN: P13.007, Volume (m³): 7.6

Unit Reference MD-SHE-0089-4500-1795-4500 Design Flow (l/s) 4.5
Design Head (m) 1.795 Flush-Flo™ Calculated

Hydro-Brake® Optimum Manhole: S11-8, DS/PN: P13.007, Volume (m³): 7.6

Objective	Minimise upstream storage	Invert Level (m)	16.443
Application	Surface	Minimum Outlet Pipe Diameter (mm)	150
Sump Available	Yes	Suggested Manhole Diameter (mm)	1200
Diameter (mm)	89		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.795	4.5	Kick-Flo®	0.796	3.1
Flush-Flo™	0.391	3.9	Mean Flow over Head Range	-	3.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.7	0.600	3.7	1.600	4.3	2.600	5.3	5.000	7.3	7.500	8.8
0.200	3.6	0.800	3.1	1.800	4.5	3.000	5.7	5.500	7.6	8.000	9.1
0.300	3.8	1.000	3.4	2.000	4.7	3.500	6.1	6.000	7.9	8.500	9.3
0.400	3.9	1.200	3.7	2.200	4.9	4.000	6.5	6.500	8.2	9.000	9.6
0.500	3.8	1.400	4.0	2.400	5.1	4.500	6.9	7.000	8.5	9.500	9.8

Depth/Flow Relationship Manhole: Roof A7, DS/PN: P24.001, Volume (m³): 2.3

Invert Level (m) 16.557

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.049	0.1500	0.067	0.1800	0.078	0.2000
0.029	0.1200	0.041	0.1400	0.058	0.1700	0.072	0.1900		

Depth/Flow Relationship Manhole: Roof A6, DS/PN: P26.001, Volume (m³): 2.6

Invert Level (m) 16.354

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.022	0.1000	0.034	0.1200	0.048	0.1500	0.065	0.1800	0.071	0.1900
0.029	0.1100	0.040	0.1400	0.057	0.1600	0.069	0.1800		

Hydro-Brake® Optimum Manhole: S11-4, DS/PN: P13.011, Volume (m³): 7.1

Unit Reference	MD-SHE-0091-4500-1655-4500	Sump Available	Yes
Design Head (m)	1.655	Diameter (mm)	91
Design Flow (l/s)	4.5	Invert Level (m)	16.076
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.655	4.5	Kick-Flo®	0.809	3.2
Flush-Flo™	0.397	4.0	Mean Flow over Head Range	-	3.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.600	3.9	1.600	4.4	2.600	5.5	5.000	7.5	7.500	9.1
0.200	3.7	0.800	3.3	1.800	4.7	3.000	5.9	5.500	7.9	8.000	9.4
0.300	4.0	1.000	3.6	2.000	4.9	3.500	6.4	6.000	8.2	8.500	9.7
0.400	4.0	1.200	3.9	2.200	5.1	4.000	6.8	6.500	8.5	9.000	10.0
0.500	4.0	1.400	4.2	2.400	5.3	4.500	7.2	7.000	8.9	9.500	10.2

Depth/Flow Relationship Manhole: Roof A5, DS/PN: P27.001, Volume (m³): 3.8

Invert Level (m) 16.020

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.031	0.3200	0.050	0.4200	0.072	0.5100	0.093	0.5800
0.043	0.3800	0.061	0.4600	0.084	0.5500	0.096	0.5900

Depth/Flow Relationship Manhole: Roof A4, DS/PN: P28.001, Volume (m³): 2.9

Invert Level (m) 16.044

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.021	0.1000	0.033	0.1200	0.048	0.1500	0.063	0.1700
0.029	0.1100	0.040	0.1400	0.056	0.1600	0.065	0.1800

Hydro-Brake® Optimum Manhole: S10, DS/PN: P1.019, Volume (m³): 6.4

Unit Reference	MD-SHE-0128-9100-1745-9100	Sump Available	Yes
Design Head (m)	1.745	Diameter (mm)	128
Design Flow (l/s)	9.1	Invert Level (m)	15.616
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.745	9.1	Kick-Flo®	1.056	7.2
Flush-Flo™	0.509	9.1	Mean Flow over Head Range	-	8.0

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

Hydro-Brake® Optimum Manhole: S10, DS/PN: P1.019, Volume (m³): 6.4

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.6	0.600	9.0	1.600	8.7	2.600	11.0	5.000	15.0	7.500	18.2
0.200	7.9	0.800	8.7	1.800	9.2	3.000	11.8	5.500	15.7	8.000	18.8
0.300	8.7	1.000	7.7	2.000	9.7	3.500	12.6	6.000	16.3	8.500	19.3
0.400	9.0	1.200	7.6	2.200	10.1	4.000	13.5	6.500	17.0	9.000	19.9
0.500	9.1	1.400	8.2	2.400	10.6	4.500	14.2	7.000	17.6	9.500	20.4

Storage Structures for SW_1

Tank or Pond Manhole: Roof D2, DS/PN: P1.001

Invert Level (m) 20.471

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	134.0	0.114	134.0	0.115	0.0

Tank or Pond Manhole: Roof D1, DS/PN: P2.001

Invert Level (m) 20.491

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	242.0	0.097	242.0	0.098	0.0

Tank or Pond Manhole: S23, DS/PN: P1.006

Invert Level (m) 20.034

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	35.0	0.816	137.0	0.817	137.0

Tank or Pond Manhole: Podium B, DS/PN: P4.001

Invert Level (m) 18.943

Tank or Pond Manhole: Podium B, DS/PN: P4.001

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2208.0	0.097	2208.0	0.098	0.0

Tank or Pond Manhole: Roof B1, DS/PN: P5.001

Invert Level (m) 18.776

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	152.0	0.114	152.0	0.115	0.0

Tank or Pond Manhole: Roof B2, DS/PN: P7.001

Invert Level (m) 18.748

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	131.0	0.114	131.0	0.115	0.0

Tank or Pond Manhole: Roof F2, DS/PN: P8.001

Invert Level (m) 20.546

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	370.0	0.114	370.0	0.115	0.0

Tank or Pond Manhole: Roof F1, DS/PN: P9.001

Invert Level (m) 19.556

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	301.0	0.097	301.0	0.098	0.0

Cellular Storage Manhole: S16, DS/PN: P1.013

Invert Level (m) 18.365 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.60
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	225.5	225.5	1.795	225.5	225.5	1.796	0.0	225.5

Tank or Pond Manhole: Roof A1, DS/PN: P11.001

Invert Level (m) 18.549

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	348.0	0.097	348.0	0.098	0.0

Tank or Pond Manhole: Roof A3, DS/PN: P12.001

Invert Level (m) 17.314

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	115.0	0.114	115.0	0.115	0.0

Tank or Pond Manhole: Roof C1, DS/PN: P13.001

Invert Level (m) 19.690

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	404.0	0.114	404.0	0.115	0.0

Tank or Pond Manhole: Roof C2, DS/PN: P14.001

Invert Level (m) 19.095

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	428.0	0.114	428.0	0.115	0.0

Tank or Pond Manhole: Roof C3, DS/PN: P15.001

Invert Level (m) 18.258

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	234.0	0.114	234.0	0.115	0.0

Tank or Pond Manhole: Roof C4, DS/PN: P16.001

Invert Level (m) 18.251

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	98.0	0.114	98.0	0.115	0.0

Tank or Pond Manhole: Podium C, DS/PN: P17.001

Invert Level (m) 17.448

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	223.0	0.097	223.0	0.098	0.0

Tank or Pond Manhole: Roof C5, DS/PN: P18.001

Invert Level (m) 17.460

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	293.0	0.114	293.0	0.115	0.0

Tank or Pond Manhole: Roof C7, DS/PN: P19.001

Invert Level (m) 16.766

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	79.0	0.114	79.0	0.115	0.0

Tank or Pond Manhole: Roof B3, DS/PN: P20.001

Invert Level (m) 17.156

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	330.0	0.097	330.0	0.098	0.0

Tank or Pond Manhole: Roof B4, DS/PN: P21.001

Invert Level (m) 16.993

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	379.0	0.114	379.0	0.115	0.0

Tank or Pond Manhole: Roof A2, DS/PN: P22.001

Invert Level (m) 17.015

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	864.0	0.114	864.0	0.115	0.0

Tank or Pond Manhole: Podium A, DS/PN: P23.001

Invert Level (m) 16.592

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2008.0	0.097	2008.0	0.098	0.0

Cellular Storage Manhole: S11-8, DS/PN: P13.007

Invert Level (m) 16.443 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.60
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	187.0	187.0	1.795	187.0	187.0	1.796	0.0	187.0

Tank or Pond Manhole: Roof A7, DS/PN: P24.001

Invert Level (m) 16.557

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	211.0	0.114	211.0	0.115	0.0

Tank or Pond Manhole: Roof A6, DS/PN: P26.001

Invert Level (m) 16.354

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	160.0	0.097	160.0	0.098	0.0

Tank or Pond Manhole: S11-4, DS/PN: P13.011

Invert Level (m) 16.076

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	67.1	0.550	157.3	1.300	275.8

Tank or Pond Manhole: Roof A5, DS/PN: P27.001

Invert Level (m) 16.020

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	233.0	0.097	233.0	0.098	0.0

Tank or Pond Manhole: Roof A4, DS/PN: P28.001

Invert Level (m) 16.044

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	127.0	0.114	127.0	0.115	0.0

Cellular Storage Manhole: S10, DS/PN: P1.019

Invert Level (m) 15.616 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.60
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	257.0	257.0	1.745	257.0	257.0	1.746	0.0	257.0

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 30 Number of Storage Structures 29 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.600 Cv (Summer) 1.000
Region Scotland and Ireland Ratio R 0.278 Cv (Winter) 1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 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	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
P1.000	Roof D2	15 Summer	100	+20%					20.569	-0.147	0.000	0.26			7.9
P1.001	Roof D2	5760 Winter	100	+20%					20.563	-0.133	0.000	0.00			0.1
P2.000	Roof D1	15 Summer	100	+20%					20.642	-0.094	0.000	0.64			19.1
P2.001	Roof D1	5760 Summer	100	+20%					20.579	-0.137	0.000	0.01			0.3
P1.002	S27	7200 Summer	100	+20%					20.549	-0.051	0.000	0.01			0.5

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Status	Level Exceeded
P1.000	Roof D2	OK	
P1.001	Roof D2	OK	
P2.000	Roof D1	OK	
P2.001	Roof D1	OK	
P1.002	S27	OK	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
P1.003	S26	7200 Summer	100	+20%	30/960 Summer				20.549	0.076	0.000	0.01		
P1.004	S25	7200 Summer	100	+20%	1/1440 Summer				20.549	0.204	0.000	0.01		
P1.005	S24	7200 Summer	100	+20%	1/480 Summer				20.549	0.289	0.000	0.02		
P1.006	S23	7200 Summer	100	+20%	1/480 Summer				20.548	0.289	0.000	0.00		
P1.007	S22	15 Summer	100	+20%					19.674	-0.127	0.000	0.40		
P1.008	S21	480 Summer	100	+20%	100/120 Summer				19.653	0.122	0.000	0.12		
P3.000	S20-4	15 Summer	100	+20%					19.779	-0.141	0.000	0.30		
P3.001	S20-3	15 Summer	100	+20%					19.691	-0.109	0.000	0.52		
P3.002	S20-2	480 Summer	100	+20%					19.658	-0.043	0.000	0.10		
P3.003	S20-1	480 Summer	100	+20%	100/180 Summer				19.657	0.110	0.000	0.16		
P4.000	Podium B	1440 Summer	100	+20%					18.971	-0.279	0.000	0.00		
P4.001	Podium B	1440 Summer	100	+20%					18.971	-0.272	0.000	0.01		
P5.000	Roof B1	1440 Summer	100	+20%	100/960 Summer				19.236	0.154	0.000	0.01		
P5.001	Roof B1	1440 Summer	100	+20%	100/960 Summer				19.236	0.160	0.000	0.00		
P1.009	S20	480 Summer	100	+20%	30/60 Summer				19.652	0.608	0.000	0.17		
P6.000	S19-1	480 Summer	100	+20%					19.654	-0.046	0.000	0.09		
P7.000	Roof B2	960 Winter	100	+20%	100/720 Summer				19.215	0.230	0.000	0.02		
P7.001	Roof B2	960 Winter	100	+20%	100/720 Summer				19.215	0.242	0.000	0.00		
P1.010	S19	480 Summer	100	+20%	30/15 Summer				19.651	0.720	0.000	0.19		
P1.011	S18	480 Summer	100	+20%	30/15 Summer				19.650	0.801	0.000	0.25		
P1.012	S17	480 Summer	100	+20%	30/15 Summer				19.648	0.854	0.000	0.30		
P8.000	Roof F2	15 Summer	100	+20%					20.709	-0.087	0.000	0.69		
P8.001	Roof F2	2160 Summer	100	+20%					20.617	-0.154	0.000	0.01		
P8.002	S16-5	15 Summer	100	+20%					20.522	-0.178	0.000	0.10		
P8.003	S16-4	15 Summer	100	+20%					20.183	-0.147	0.000	0.26		
P8.004	S16-3	15 Summer	100	+20%					19.829	-0.131	0.000	0.36		
P9.000	Roof F1	15 Summer	100	+20%					19.754	-0.078	0.000	0.76		
P9.001	Roof F1	600 Summer	100	+20%					19.649	-0.132	0.000	0.01		

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P1.003	S26	0.5	SURCHARGED	
P1.004	S25	0.5	SURCHARGED	
P1.005	S24	0.5	SURCHARGED	
P1.006	S23	0.1	SURCHARGED	
P1.007	S22	19.8	OK	
P1.008	S21	4.7	SURCHARGED	
P3.000	S20-4	12.6	OK	
P3.001	S20-3	23.2	OK	
P3.002	S20-2	5.0	OK	
P3.003	S20-1	8.4	SURCHARGED	
P4.000	Podium B	0.0	OK	
P4.001	Podium B	1.0	OK	
P5.000	Roof B1	0.7	SURCHARGED	
P5.001	Roof B1	0.1	SURCHARGED	
P1.009	S20	12.1	SURCHARGED	
P6.000	S19-1	5.5	OK	
P7.000	Roof B2	0.5	SURCHARGED	
P7.001	Roof B2	0.1	SURCHARGED	
P1.010	S19	19.6	SURCHARGED	
P1.011	S18	23.1	SURCHARGED	
P1.012	S17	28.7	SURCHARGED	
P8.000	Roof F2	20.8	OK	
P8.001	Roof F2	0.2	OK	
P8.002	S16-5	6.0	OK	
P8.003	S16-4	13.6	OK	
P8.004	S16-3	18.0	OK	
P9.000	Roof F1	24.1	OK	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P9.001	Roof F1	0.5	OK	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
P8.005	S16-2	480 Summer	100	+20%					19.650	-0.048	0.000	0.07		
P10.000	S16-1-1	480 Summer	100	+20%					19.648	-0.052	0.000	0.04		
P8.006	S16-1	480 Summer	100	+20%	30/30 Summer				19.648	0.751	0.000	0.06		
P1.013	S16	480 Summer	100	+20%	1/180 Summer				19.646	0.906	0.000	0.07		368
P1.014	S15	30 Summer	100	+20%					18.442	-0.260	0.000	0.20		
P11.000	Roof A1	15 Summer	100	+20%					18.806	-0.011	0.000	1.00		
P11.001	Roof A1	720 Summer	100	+20%					18.632	-0.142	0.000	0.01		
P1.015	S14	30 Summer	100	+20%					18.328	-0.304	0.000	0.08		
P1.016	S13	30 Summer	100	+20%					17.395	-0.298	0.000	0.09		
P12.000	Roof A3	15 Summer	100	+20%					17.425	-0.153	0.000	0.23		
P12.001	Roof A3	960 Summer	100	+20%					17.371	-0.168	0.000	0.00		
P1.017	S12	30 Summer	100	+20%					17.106	-0.299	0.000	0.09		
P13.000	Roof C1	15 Summer	100	+20%					19.870	-0.074	0.000	0.79		
P13.001	Roof C1	2160 Summer	100	+20%					19.764	-0.151	0.000	0.01		
P13.002	S11-13	15 Summer	100	+20%					19.800	0.000	0.000	0.87		
P14.000	Roof C2	15 Summer	100	+20%					19.278	-0.071	0.000	0.81		
P14.001	Roof C2	2160 Summer	100	+20%					19.170	-0.150	0.000	0.01		
P13.003	S11-12	15 Summer	100	+20%	100/15 Summer				19.485	0.254	0.000	0.88		
P15.000	Roof C3	15 Summer	100	+20%					18.392	-0.117	0.000	0.47		
P15.001	Roof C3	2160 Summer	100	+20%					18.333	-0.150	0.000	0.00		
P16.000	Roof C4	15 Summer	100	+20%					18.350	-0.159	0.000	0.19		
P16.001	Roof C4	720 Summer	100	+20%					18.308	-0.168	0.000	0.00		
P13.004	S11-11	15 Summer	100	+20%	30/15 Summer				18.817	0.452	0.000	1.26		
P17.000	Podium C	15 Summer	100	+20%					17.573	-0.125	0.000	0.41		
P17.001	Podium C	960 Summer	100	+20%					17.521	-0.152	0.000	0.00		
P18.000	Roof C5	15 Summer	100	+20%					17.606	-0.107	0.000	0.54		
P18.001	Roof C5	960 Summer	100	+20%					17.532	-0.153	0.000	0.01		
P13.005	S11-10	15 Summer	100	+20%					17.502	-0.115	0.000	0.68		

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P8.005	S16-2	4.6	OK	
P10.000	S16-1-1	2.0	OK	
P8.006	S16-1	7.9	SURCHARGED	
P1.013	S16	6.0	SURCHARGED	
P1.014	S15	19.7	OK	
P11.000	Roof A1	29.9	OK	
P11.001	Roof A1	0.8	OK	
P1.015	S14	19.8	OK	
P1.016	S13	19.9	OK	
P12.000	Roof A3	6.7	OK	
P12.001	Roof A3	0.2	OK	
P1.017	S12	20.1	OK	
P13.000	Roof C1	23.6	OK	
P13.001	Roof C1	0.3	OK	
P13.002	S11-13	48.3	OK	
P14.000	Roof C2	24.1	OK	
P14.001	Roof C2	0.3	OK	
P13.003	S11-12	66.9	SURCHARGED	
P15.000	Roof C3	14.0	OK	
P15.001	Roof C3	0.2	OK	
P16.000	Roof C4	5.6	OK	
P16.001	Roof C4	0.1	OK	
P13.004	S11-11	84.4	SURCHARGED	
P17.000	Podium C	12.3	OK	
P17.001	Podium C	0.1	OK	
P18.000	Roof C5	16.3	OK	
P18.001	Roof C5	0.2	OK	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P13.005	S11-10	91.2	OK	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
P19.000	Roof C7	960 Summer	100	+20%	100/360 Summer				17.430	0.348	0.000	0.01		
P19.001	Roof C7	960 Summer	100	+20%	30/1440 Summer				17.430	0.364	0.000	0.00		
P13.006	S11-9	600 Summer	100	+20%	30/15 Summer				17.487	0.476	0.000	0.25		
P20.000	Roof B3	960 Summer	100	+20%	100/360 Summer				17.619	0.196	0.000	0.09		
P20.001	Roof B3	960 Summer	100	+20%	100/360 Summer				17.619	0.238	0.000	0.01		
P20.002	67	600 Summer	100	+20%	100/180 Summer				17.484	0.165	0.000	0.01		
P21.000	Roof B4	2160 Summer	100	+20%					17.358	-0.018	0.000	0.02		
P21.001	Roof B4	2160 Summer	100	+20%					17.358	-0.010	0.000	0.00		
P20.003	68	600 Summer	100	+20%	30/480 Summer				17.484	0.284	0.000	0.01		
P20.004	S11-8-A	600 Summer	100	+20%	30/120 Summer				17.484	0.429	0.000	0.01		
P22.000	Roof A2	15 Summer	100	+20%	30/15 Summer				17.353	0.089	0.000	1.65		
P22.001	Roof A2	2880 Summer	100	+20%					17.222	-0.018	0.000	0.01		
P22.002	S11-8-2	1440 Summer	100	+20%	100/960 Summer				17.373	0.273	0.000	0.01		
P23.000	Podium A	8640 Summer	100	+20%	100/960 Summer				17.810	0.695	0.000	0.02		
P23.001	Podium A	8640 Summer	100	+20%	30/2160 Summer				17.810	0.843	0.000	0.02		
P23.002	S11-8-1-1	1440 Summer	100	+20%	30/2160 Summer				17.376	0.445	0.000	0.01		
P22.003	S11-8-1	1440 Summer	100	+20%	30/2160 Summer				17.382	0.484	0.000	0.01		
P13.007	S11-8	600 Summer	100	+20%	30/30 Summer				17.484	0.666	0.000	0.04		580
P24.000	Roof A7	2880 Winter	100	+20%	100/1440 Summer				17.038	0.237	0.000	0.01		
P24.001	Roof A7	2880 Winter	100	+20%	100/1440 Summer				17.038	0.256	0.000	0.01		
P13.008	S11-7	2880 Winter	100	+20%	100/960 Winter				16.985	0.237	0.000	0.03		
P25.000	S11-6-1	15 Summer	100	+20%					17.053	-0.127	0.000	0.40		
P13.009	S11-6	2880 Winter	100	+20%	30/960 Winter				16.984	0.325	0.000	0.04		
P13.010	S11-5	2880 Winter	100	+20%	30/600 Summer				16.983	0.358	0.000	0.04		
P26.000	Roof A6	2880 Winter	100	+20%	30/960 Summer				17.023	0.413	0.000	0.01		
P26.001	Roof A6	2880 Winter	100	+20%	30/720 Summer				17.023	0.444	0.000	0.00		
P13.011	S11-4	2880 Winter	100	+20%	30/240 Summer				16.981	0.455	0.000	0.03		
P13.012	S11-3	2160 Winter	100	+20%	100/960 Summer				16.834	0.344	0.000	0.02		

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P19.000	Roof C7	0.5	SURCHARGED	
P19.001	Roof C7	0.1	SURCHARGED	
P13.006	S11-9	20.5	SURCHARGED	
P20.000	Roof B3	2.8	SURCHARGED	
P20.001	Roof B3	0.5	SURCHARGED	
P20.002	67	0.5	SURCHARGED	
P21.000	Roof B4	1.3	OK	
P21.001	Roof B4	0.2	OK	
P20.003	68	0.8	SURCHARGED	
P20.004	S11-8-A	1.0	SURCHARGED	
P22.000	Roof A2	49.4	SURCHARGED	
P22.001	Roof A2	0.6	OK	
P22.002	S11-8-2	0.9	SURCHARGED	
P23.000	Podium A	2.6	SURCHARGED	
P23.001	Podium A	1.6	SURCHARGED	
P23.002	S11-8-1-1	1.0	SURCHARGED	
P22.003	S11-8-1	1.3	SURCHARGED	
P13.007	S11-8	3.8	SURCHARGED	
P24.000	Roof A7	0.4	SURCHARGED	
P24.001	Roof A7	0.2	SURCHARGED	
P13.008	S11-7	4.7	SURCHARGED	
P25.000	S11-6-1	15.3	OK	
P13.009	S11-6	5.3	SURCHARGED	
P13.010	S11-5	5.9	SURCHARGED	
P26.000	Roof A6	0.3	SURCHARGED	
P26.001	Roof A6	0.1	SURCHARGED	
P13.011	S11-4	4.0	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P13.012	S11-3	4.2	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
P27.000	Roof A5	2160 Winter	100	+20%	100/1440 Summer				16.857	0.351	0.000	0.00		
P27.001	Roof A5	2160 Winter	100	+20%	30/2160 Summer				16.857	0.387	0.000	0.00		
P13.013	S11-2	2160 Winter	100	+20%	30/1440 Summer				16.833	0.445	0.000	0.02		
P28.000	Roof A4	2160 Winter	100	+20%	30/1440 Summer				16.854	0.559	0.000	0.01		
P28.001	Roof A4	2160 Winter	100	+20%	30/1440 Summer				16.854	0.585	0.000	0.00		
P13.014	S11-1	2160 Winter	100	+20%	30/480 Summer				16.831	0.626	0.000	0.04		
P1.018	S11	2160 Winter	100	+20%	30/360 Summer				16.830	0.660	0.000	0.06		
P1.019	S10	2160 Winter	100	+20%	1/180 Summer				16.828	0.912	0.000	0.18		696
P1.020	S9	7200 Winter	100	+20%					15.659	-0.230	0.000	0.13		
P1.021	S8	720 Summer	30	+20%					15.527	-0.227	0.000	0.14		
P1.022	S7	2880 Summer	30	+20%					15.398	-0.225	0.000	0.14		
P1.023	S6	360 Summer	100	+20%					15.278	-0.224	0.000	0.15		
P1.024	S5	480 Winter	30	+20%					15.195	-0.225	0.000	0.14		
P1.025	S4	720 Winter	30	+20%					14.224	-0.226	0.000	0.14		
P1.026	S3	5760 Winter	100	+20%					14.083	-0.226	0.000	0.14		
P1.027	S2	480 Winter	100	+20%					13.936	-0.226	0.000	0.14		
P1.028	S1	480 Summer	30	+20%					13.782	-0.227	0.000	0.14		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P27.000	Roof A5	0.8	SURCHARGED	
P27.001	Roof A5	0.5	SURCHARGED	
P13.013	S11-2	4.5	SURCHARGED	
P28.000	Roof A4	0.3	SURCHARGED	
P28.001	Roof A4	0.2	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
P13.014	S11-1	4.9	SURCHARGED	
P1.018	S11	11.5	SURCHARGED	
P1.019	S10	9.1	SURCHARGED	
P1.020	S9	9.1	OK	
P1.021	S8	9.1	OK	
P1.022	S7	9.1	OK	
P1.023	S6	9.1	OK	
P1.024	S5	9.1	OK	
P1.025	S4	9.1	OK	
P1.026	S3	9.1	OK	
P1.027	S2	9.1	OK	
P1.028	S1	9.1	OK	

Appendix D : Correspondence with Uisce Eireann

CONFIRMATION OF FEASIBILITY

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Oifig Sheachadta na
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Uisce Éireann
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www.water.ie

22 September 2025

Our Ref: CDS25004073 Pre-Connection Enquiry
Miltown Park, Sandford Road, Ranelagh, Dublin 6

Dear Applicant/Agent,

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

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 577 unit(s) at Miltown Park, Sandford Road, Ranelagh, Dublin 6, (the **Development)**.

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

- **Water Connection**
  - Feasible without infrastructure upgrade by Uisce Éireann
  - Approximately 30m of 200mm ID diameter connection main, including a meter equipped with online telemetry to connect the existing Uisce Éireann network in Belmont DMA to the site boundary (see Figure below).
  - An on-site booster pump station may be required, subject to the elevation of the proposed apartment blocks.
- **Wastewater Connection**
  - Feasible without infrastructure upgrade by Uisce Éireann

- At the Connection Application stage, the developer must confirm that the proposed hard standing area has been appropriately accounted for within the site layout and provide stormwater connection details.

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

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

Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

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

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

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

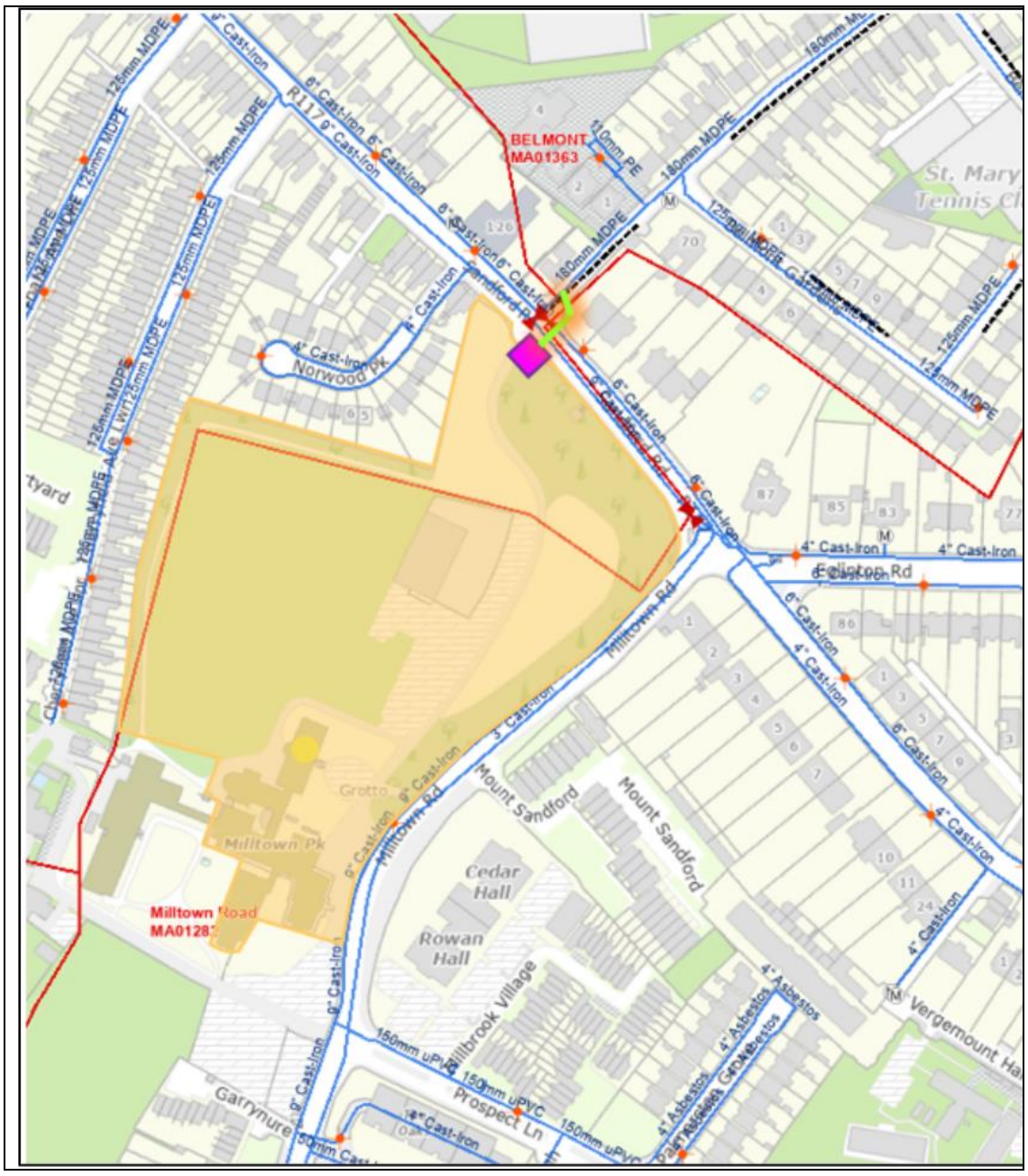
Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

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

Section B – Details of Uisce Éireann's Network(s)

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



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

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

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

Emma Daly
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Dublin 7
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Uisce Éireann
PO Box 448
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Cork City

www.water.ie

10 November 2025

Re: Design Submission for Miltown Park, Sandford Road, Ranelagh, Dublin 6 (the "Development")
(the "Design Submission") / Connection Reference No: CDS25004073

Dear Emma Daly,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Antonio Garzón Mielgo
Email: antonio.garzonmielgo@water.ie

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

- 190226-X-05-Z00-DTM-DR-DBFL-CE-1301 Site Services Layout Rev 3
- 190226-X-05-Z00-DTM-DR-DBFL-CE-3311 Foul Water Longsections Sheet 1 Rev 1
- 190226-X-05-Z00-DTM-DR-DBFL-CE-3312 Foul Water Longsections Sheet 2 Rev 1
- 190226-X-93-Z00-DTM-DR-DBFL-CE-1311 Site Watermain Layout Rev 4

Additional Comments

The design submission will be subject to further technical review at connection application stage.

Uisce Éireann cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

While Uisce Éireann notes that the water and wastewater services infrastructure will remain private and not be vested, we have the following comments: It is recommended that the foul sewer shall have 3 m clearance from proposed or existing structures.

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

ON ORIGINAL

0 5 10 20 30 40 50mm

NOTES

N W E S

S6 CL 18.304 IL 15.120

MATCH LINE

300Ø 1:250

300Ø 1:247

S4 CL 18.328 IL 14.150

S3 CL 17.608 IL 14.009

300Ø 1:250

S2 CL 17.148 IL 13.862

300Ø 1:251

S1 CL 16.665 IL 13.709

300Ø 1:252

S0 CL 15.655 IL 13.369

HEAD OF EXISTING SURFACE WATER DRAIN IN EGLINTON ROAD (IL 16.12)

EXISTING 225 MM DRAIN REPLACED WITH 300 DIAMETER DRAIN RUNNING AT LOWER LEVER / FLATTER GRADIENT

EXISTING 300 DIAMETER SURFACE WATER LINE

SADDLE ON TO EXISTING 600MM COMBINED SEWER

DISCHARGE MANHOLE

EXISTING 600Ø COMBINED SEWER

FA-0 CL 17.996 IL 16.039

FA-1 CL 18.048 IL 16.069

S6-1 CL 18.237 IL 17.086

CATCHMENT 2 ATTENUATION TANK (STORMTECH MC3500) TO STORE FLOWS FROM UP TO 1 IN 100 YR REYURN PERIOD EVENT PLUS 20% CLIMATE CHANGE. TOTAL STORAGE VOLUME PROVIDED 132.8 NO. OF ROWS 4 NO. OF UNITS / ROW 5 IL 16.443 TWL18.118

FLOW CONTROL MANHOLE (HYDROBRAKE OPTIMUM OR SIMILAR) RESTRICTING FLOWS TO IL 16.443 MaxQ 4.7l/s DESIGN HEAD = 1.675m

GRATED MANHOLE

STORAGE POND STORAGE VOLUME 65m³ SIDE SLOPES 1:3, TOP OF BANK 18.40 TOP WATER LEVEL 17.72 INVERT LEVEL 17.07

FLOW CONTROL MANHOLE HYDROBRAKE OPTIMUM OR SIMILAR IL 16.077 MAXQ 4.6 L/S DESIGN HEAD 1.675M

FFL 20.20 FFL 20.52 FFL 21.00 FFL 21.15 FFL 21.25 FFL 21.20 FFL 21.20 FFL 21.20 FFL 20.90 FFL 20.90 FFL 21.80 FFL 19.10 FFL 18.60 FFL 19.70 FFL 20.10 FFL 20.40 FFL 20.80 FFL 18.60

BLOCK C BLOCK B BLOCK D TABOR HOUSE CHAPEL BLOCK F BLOCK A1 BLOCK A2

225 DIA. OUTLET FROM BIO-RETENTION AREA

225 DIA. OUTLET FROM SLUNG SURFACE WATER DRAINAGE DISCHARGING VIA BIO-RETENTION AREA

225 DIA. SURFACE WATER

NOTCH WEIR Q=0.1L/SEC

STORAGE POND STORAGE VOLUME 8.4m³ SIDE SLOPES 1:4, TOP OF BANK 20.70 TOP WATER LEVEL 20.40 INVERT LEVEL 20.099

SOFFIT TO SOFFIT

ACO CHANNEL DRAINING VIA TREE PIT/SUDS

ACO CHANNEL

225mmØ SURFACE WATER CONNECTION TO SLUNG DRAINAGE

CONNECTIONS TO SLUNG DRAINAGE

KLARGESTER FULL RETENTION SEPARATOR MODEL NSFA010

EXISTING 375Ø COMBINED SEWER

FLOW CONTROL MANHOLE HYDROBRAKE OPTIMUM OR SIMILAR IL 18.365 MAXQ 2.6 L/S DESIGN HEAD 1.675m

FLOW CONTROL MANHOLE HYDROBRAKE OPTIMUM OR SIMILAR IL 15.616 MAXQ 6.0 l/s DESIGN HEAD 1.675m

CATCHMENT 4 ATTENUATION TANK (STORMTECH MC3500) TO STORE FLOWS FROM UP TO 1 IN 100 YR REYURN PERIOD EVENT PLUS 20% CLIMATE CHANGE. TOTAL STORAGE VOLUME PROVIDED 160.7m³ NO. OF ROWS 6 NO. OF UNITS / ROW 4 IL 15.616 TWL17.291

CATCHMENT 1 ATTENUATION TANK (STORMTECH MC3500) TO STORE FLOWS FROM UP TO 1 IN 100 YR REYURN PERIOD EVENT PLUS 20% CLIMATE CHANGE. TOTAL STORAGE VOLUME PROVIDED 283.4m³ NO. OF ROWS 9 NO. OF UNITS / ROW 5 IL 18.365 TWL20.04

LEGEND

- SITE BOUNDARY
- PROPOSED SURFACE WATER SEWER
- SURFACE WATER CATCHPIT CHAMBER WITH GRATED COVER
- PROPOSED 150mm FILTER DRAIN
- PROPOSED INLET KEB
- ROAD GULLY AND 150Ø COLLECTOR PIPE
- GULLY WITH 150mm LEAD PIPE (DRAINING VIA TREEPIT)
- PROPOSED TREE PIT
- PROPOSED ACO CHANNEL
- PROPOSED SURFACE WATER COLLECTOR
- PROPOSED ACCESS JUNCTION
- EXISTING SURFACE WATER SEWER
- EXISTING SURFACE WATER SEWER FROM IRISH WATER RECORDS
- PROPOSED BIORETENTION AREA
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL COLLECTOR
- EXISTING FOUL WATER SEWER
- EXISTING LEVEL
- PROPOSED LEVEL
- FINISHED FLOOR LEVEL
- PERMEABLE PARKING
- PROPOSED ATTENUATION BASIN

LIST OF IRISH WATER WASTEWATER STANDARD DETAILS BROUGHT INTO THE CONTRACT

STD-WW-02	TYPICAL LAYOUT FOR SEWER WITHIN NEW DEVELOPMENT
STD-WW-03	DRAIN AND SERVICE CONNECTION PIPEWORK
STD-WW-04	TYPICAL SEWER/SERVICE PIPE CONNECTION
STD-WW-05	TYPICAL SERVICE LAYOUT INDICATING SEPARATION DISTANCES
STD-WW-06	RESTRICTIONS ON TREES/SHRUBS PLANTING ADJACENT TO SEWERS
STD-WW-07	TRENCH BACKFILL & BEDDING
STD-WW-08	CONCRETE BED, HAUNCH & SURROUND TO WASTEWATER PIPES
STD-WW-09	BLOCKWORK MANHOLE (<450mmØ)
STD-WW-10	PRE-CAST CONCRETE MANHOLE
STD-WW-11	IN-SITU CONCRETE MANHOLE
STD-WW-12	BACKDROP MANHOLES
STD-WW-13	PRIVATE SIDE INSPECTION CHAMBER
STD-WW-14	THRUST BLOCKS FOR RISING MAINS
STD-WW-15	SCOUR VALVE CHAMBER (FOUL RISING MAIN <200mmØ)
STD-WW-16	SLUICE VALVE DETAILS FOR RISING MAINS DUCTILE IRON (D.I) PIPE (<200mmØ)(SHEET 1 OF 2)
STD-WW-17	SLUICE VALVE DETAILS FOR RISING MAIN POLYETHYLENE (P.E) PIPE (<200mmØ)(SHEET 2 OF 2)
STD-WW-18	AIR VALVE CHAMBER (FOUL RISING MAIN <200mmØ)
STD-WW-19	DUCT CHAMBER
STD-WW-20	EMERGENCY OVERFLOW STRUCTURE
STD-WW-21	TYPICAL DITCH/STREAM CROSSING FOR GRAVITY MAIN (SHEET 1 OF 2)
STD-WW-22	TYPICAL DITCH/STREAM CROSSING FOR RISING MAIN (SHEET 2 OF 2)
STD-WW-23	TYPICAL BRIDGE CROSSING FOR RISING MAIN (SHEET 1 OF 2)
STD-WW-24	TYPICAL BRIDGE CROSSING FOR RISING MAIN (SHEET 2 OF 2)
STD-WW-25	SECURITY GATE & FENCING
STD-WW-26	INDICATIVE PUMPING STATION LAYOUT
STD-WW-27	FLOW METER CHAMBER (FOUL RISING MAIN <200mmØ)
STD-WW-28	INDICATIVE SUBMERSIBLE PUMPING STATION
STD-WW-28A	INDICATIVE PRE-CAST CONCRETE SUBMERSIBLE PUMPING STATION
STD-WW-29	RISING MAIN DISCHARGE MANHOLE
STD-WW-30	KIOSK TYPE 1 PUMPING STATION & WET KIOSK (SHEET 1 OF 2)
STD-WW-31	KIOSK TYPE 2 + 3 PUMPING STATION & WET KIOSK (SHEET 2 OF 2)
STD-WW-32	HARDSTANDING AREA PUMPING STATION (PERMEABLE & IMPERMEABLE)
STD-WW-33	LAMP BOLLARD & LAMP STANDARD
STD-WW-34	VENT STACK

GENERAL NOTES:

1. ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CIVIL ENGINEERING SPECIFICATION AND STANDARD CONSTRUCTION DETAILS.
2. ALL DIMENSIONS IN METRES UNLESS SPECIFIED OTHERWISE.
3. ALL CO-ORDINATES ARE TO IRISH TRANSVERSE MERCATOR.
4. ALL LEVELS ARE TO ORDNANCE DATUM (MALIN HEAD).
5. ALL TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT SHALL COMPLY FULLY WITH THE CIVIL ENGINEERING SPECIFICATION AND STANDARD CONSTRUCTION DETAILS
6. THE CONTRACTOR MUST LIAISE DIRECTLY WITH LOCAL AUTHORITY DEPARTMENTS AS DIRECTED IN THE CIVIL ENGINEERING SPECIFICATION AND STANDARD CONSTRUCTION DETAILS.
7. ALL VEHICULAR & PEDESTRIAN, CYCLE & PRIVATE ACCESS ROUTES WITHIN AND SURROUNDING THE WORKS EXTENTS MUST BE MAINTAINED THROUGHOUT THE WORKS IN ACCORDANCE WITH THE CONTRACTORS APPROVED TEMPORARY TRAFFIC MANAGEMENT PLAN & CONSTRUCTION MANAGEMENT PLAN.

DRAWING SPECIFIC NOTES

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES.
2. CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF EXISTING DRAINAGE LEVELS & THE LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE
3. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NRA SPECIFICATION FOR ROAD WORKS UNLESS NOTED OTHERWISE
4. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
5. ALL SURFACE WATER DRAINAGE WORKS TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY'S CODE OF PRACTICE FOR DRAINAGE AND THE GDSDS
6. ALL FOUL DRAINAGE WORKS TO BE IN ACCORDANCE WITH IRISH WATERS' CODE OF PRACTICE FOR WASTEWATER SUPPLY AND WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
7. FOUL SEWERS TO BE CONCRETE PIPES (SPIGOT AND SOCKET JOINTS AND RUBBER RING FITTINGS COMPLYING WITH IS EN 1916) OR THERMOPLASTIC STRUCTURED WALL PIPES (COMPLYING WITH THE PROVISION OF IS EN 13476 AND WIS 4-35-01 2000) AND COMPLY WITH THE REQUIREMENTS OF THE IRISH WATER CODE OF PRACTICE
8. ALL SURFACE WATER SEWERS TO BE CLASS H CONCRETE TO EN1916 & IS 6 2004.
9. SURFACE WATER COLLECTOR DRAINS 150mm DIA.
10. FOUL HOUSE CONNECTIONS TO BE 100mm DIA.
11. CONTRACTOR SHALL INSPECT THE ROUTE & CONFIRM LOCATIONS OF ALL TREES, FEATURES, ENTRANCES & ASPECTS IMPACTING CONSTRUCTION OF THE WORKS
12. NOTE THAT THE CONTRACTOR AND/OR ARCHITECT ARE RESPONSIBLE FOR CONNECTIONS INTO THE BUILDING
13. THIS DRAWING IS BASED ON TOPO SURVEY BY DAVIDSON HICKEY IN OCT 2019 AND APEX SURVEYS IN JAN 2020

rev	date	description	by	chkd.
3	07-11-25	SODA APPLICATION	HvH	SM
2	03-07-25	GENERAL UPDATED	GDN	EJD
1	01-07-25	UPDATED LAYOUT	GDN	EJD
0	26-06-25	LRD APPLICATION	PGC	ED

STATUS CODES

purpose	acceptance
P3 - PLANNING PERMISSION	S - ISSUED

DBFL CONSULTING ENGINEERS

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DUBLIN | CORK | GALWAY | WATERFORD

project ref.

SANDFORD ROAD, MILLTOWN

drawing title

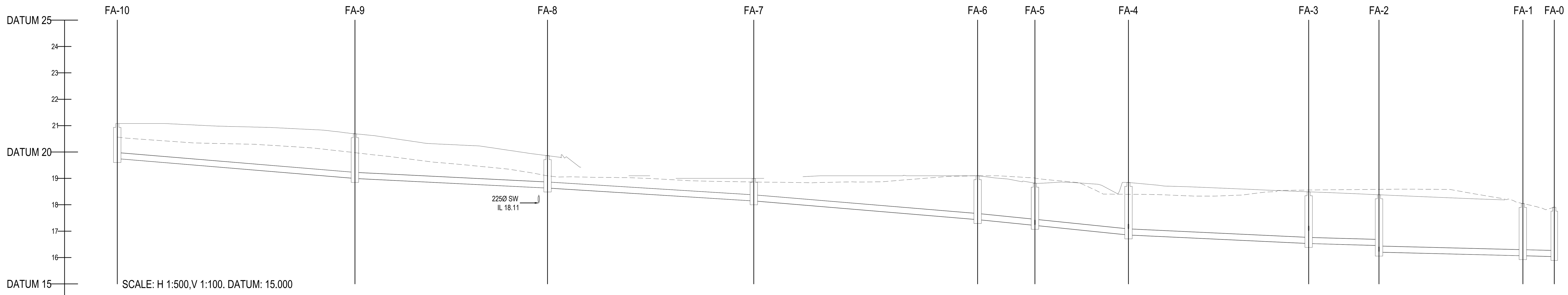
SITE SERVICES LAYOUT

client

SANDFORD LIVING LIMITED

designed by	author	scale	sheet size
BK	OWF	1:500	A1P

drawing no. 190226-X-05-Z00-DTM-DR-DBFL-CE-1301 revision 3



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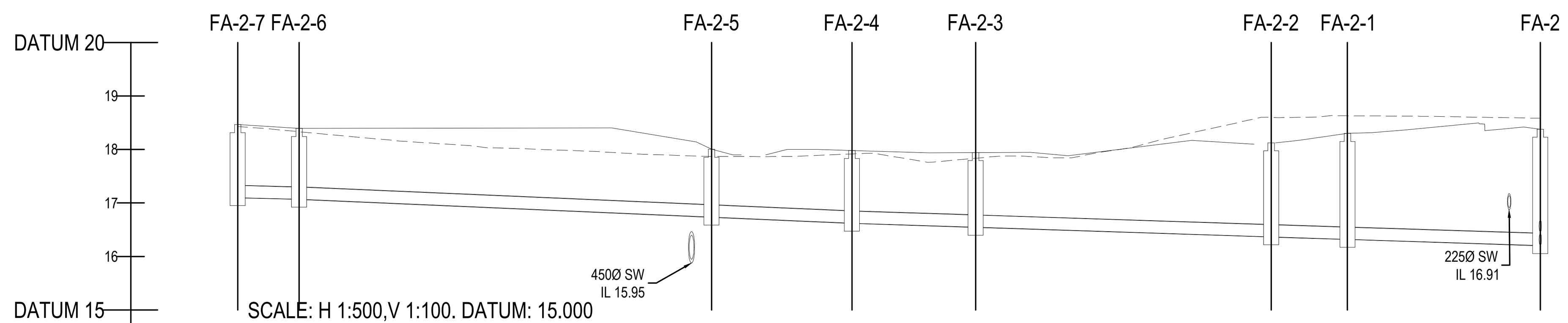
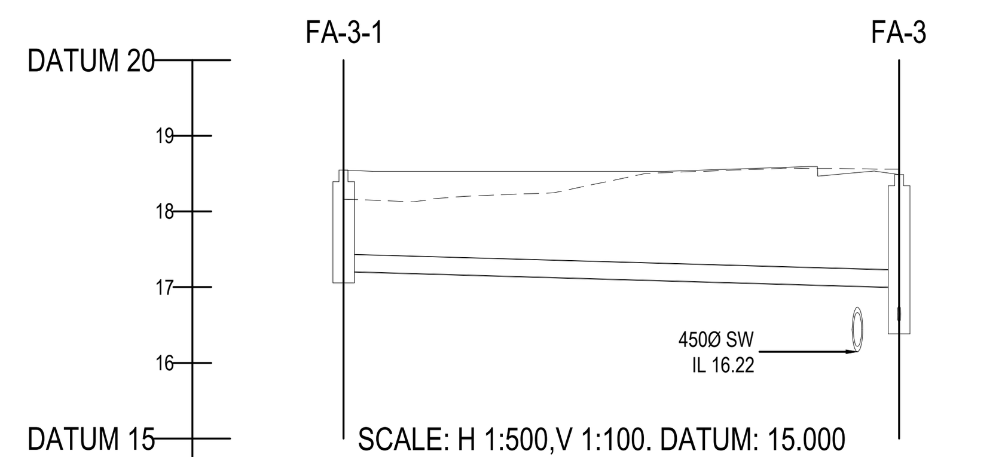
	FA-10	FA-9	FA-8	FA-7	FA-6	FA-5	FA-4	FA-3	FA-2	FA-1	FA-0
COVER LEVEL	21.081	20.691	19.860	19.000	19.100	18.818	18.846	18.489	18.378	18.048	17.906
INVERT LEVEL	19.750	19.000 19.000	18.635 18.635	18.147 18.147	17.440 17.440	17.220 17.220	16.856 16.856	16.534 16.534	16.456 16.205	16.069 16.069	16.039
DEPTH (m)	1.331	1.691	1.225	0.853	1.660	1.598	1.990	1.955	2.173	1.979	1.867
DISTANCE (m)	45.01	36.49	39.07	42.39	10.86	17.72	34.13	13.32	27.26	5.96	
PIPE SLOPE	1:60	1:100	1:80	1:60	1:49	1:49	1:106	1:171	1:200	1:199	
PIPE SIZE	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	



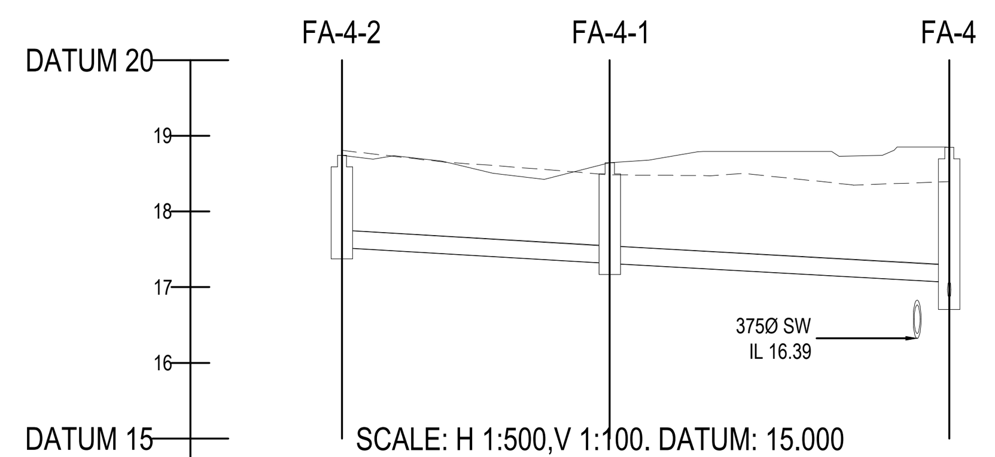
SCALE: H 1:500,V 1:100. DATUM: 15.000

	FA-2-7	FA-2-6	FA-2-5	FA-2-4	FA-2-3	FA-2-2	FA-2-1	FA-2
COVER LEVEL	18.465	18.392	18.004	17.981	17.942	18.123	18.301	18.378
INVERT LEVEL	17.100	17.071 17.071	16.736 16.736	16.622 16.622	16.547 16.547	16.367 16.367	16.321 16.321	16.205
DEPTH (m)	1.365	1.321	1.268	1.359	1.395	1.756	1.980	2.173
DISTANCE (m)	5.73	38.55	13.12	11.56	27.62	7.13	18.02	
PIPE SLOPE	1:198	1:115	1:115	1:154	1:153	1:155	1:155	
PIPE SIZE	225mm	225mm	225mm	225mm	225mm	225mm	225mm	



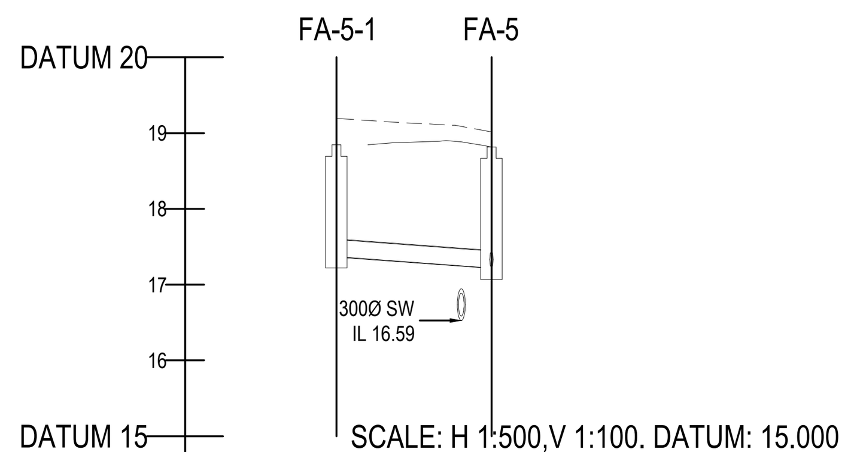
SCALE: H 1:500,V 1:100. DATUM: 15.000

	FA-3-1	FA-3
COVER LEVEL	18.546	18.489
INVERT LEVEL	17.207	16.997
DEPTH (m)	1.339	1.955
DISTANCE (m)	36.72	
PIPE SLOPE	1:175	
PIPE SIZE	225mm	



SCALE: H 1:500,V 1:100. DATUM: 15.000

	FA-4-2	FA-4-1	FA-4
COVER LEVEL	18.740	18.646	18.846
INVERT LEVEL	17.524	17.316 17.316	17.067
DEPTH (m)	1.216	1.330	1.990
DISTANCE (m)	17.69	22.42	
PIPE SLOPE	1:85	1:90	
PIPE SIZE	225mm	225mm	



SCALE: H 1:500,V 1:100. DATUM: 15.000

	FA-5-1	FA-5
COVER LEVEL	18.844	18.818
INVERT LEVEL	17.370	17.220
DEPTH (m)	1.474	1.598
DISTANCE (m)	10.24	
PIPE SLOPE	1:68	
PIPE SIZE	225mm	

ON ORIGINAL
0 5 10 20 30 40 50mm

NOTES:

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2. ALL LEVELS ARE IN METRES AND ARE RELATED TO ORDNANCE DATUM
3. CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF PAVEMENT LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE
4. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NRA SPECIFICATION FOR ROAD WORKS UNLESS NOTED OTHERWISE
5. THIS DRAWING IS FOR PLANNING PURPOSES ONLY
6. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
7. WHERE COVER TO PIPE IS LESS THAN 1200mm (ROAD/PATH/VERGE) OR 900mm (OPEN SPACE) SURROUND PIPE IN MINIMUM 150mm CONCRETE

KEY

- - - - - - - - EXISTING GROUND PROFILE
———— PROPOSED GROUND PROFILE

rev	date	description	by	chkd.
1	07-11-25	SODA APPLICATION	HvH	SM
0	26-06-25	LRD APPLICATION	PGC	ED

STATUS CODES

purpose	acceptance
P3 - PLANNING PERMISSION	S - ISSUED

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DUBLIN | CORK | GALWAY | WATERFORD

project ref.

SANDFORD ROAD, MILLTOWN

drawing title

FOUL WATER LONGSECTIONS SHEET 1

client

SANDFORD LIVING LIMITED

designed by	author	scale	sheet size
EDA	RMC	AS SHOWN	A1

drawing no.	revision
190226-X-92-Z00-DTM-DR-DBFL-CE-3311	1

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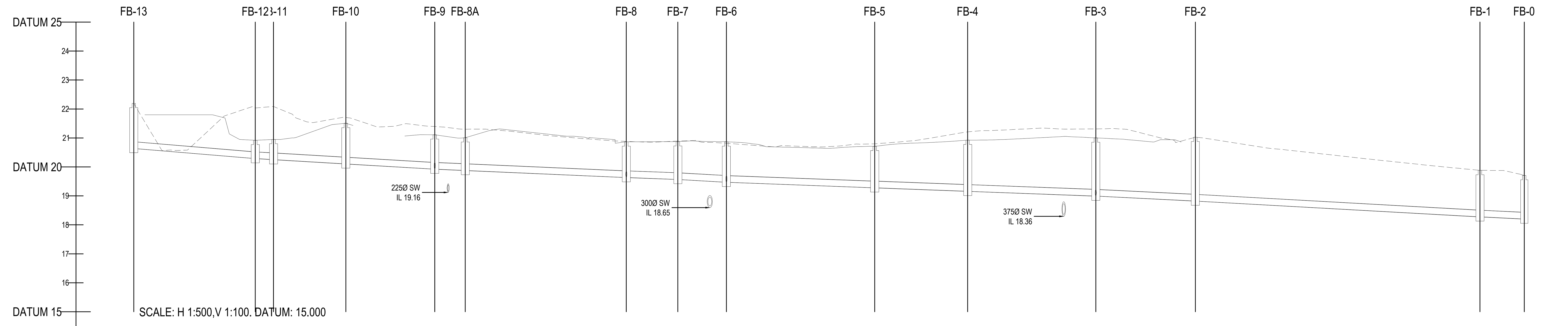
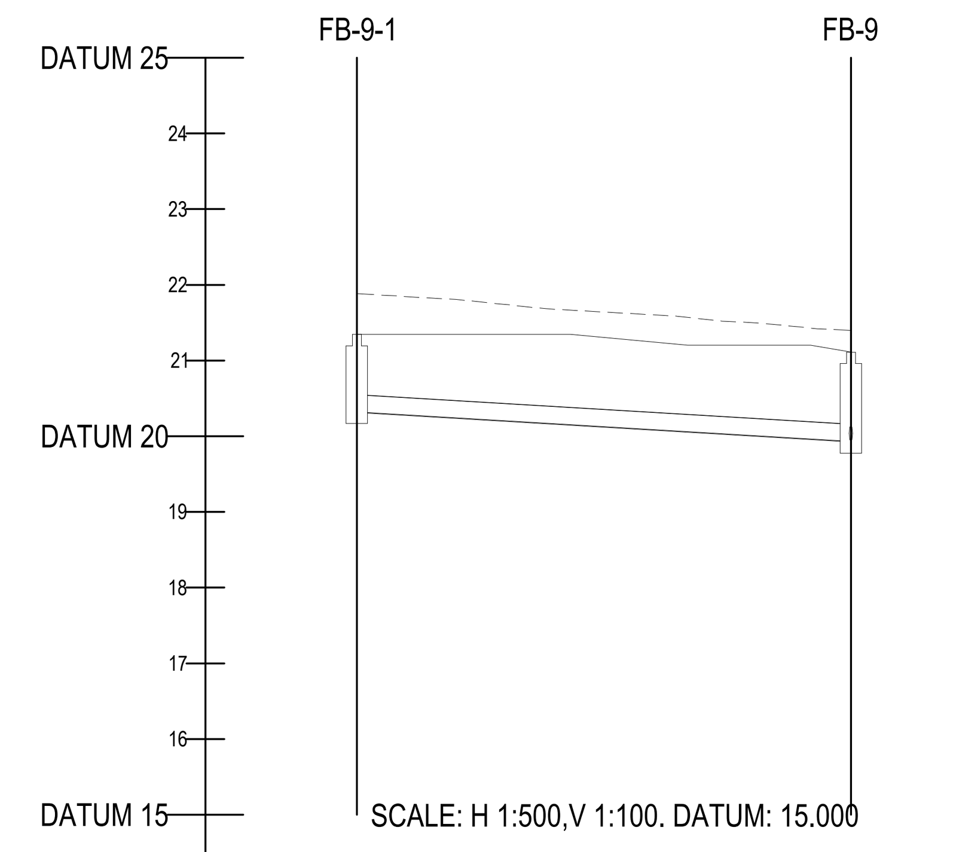


		FB-13	FB-12	FB-11	FB-10	FB-9	FB-8A	FB-8	FB-7	FB-6	FB-5	FB-4	FB-3	FB-2	FB-1	FB-0
COVER LEVEL		22.193	20.919	20.950	21.505	21.110	21.008	20.866	20.873	20.867	20.711	20.924	21.001	21.025	19.881	19.705
INVERT LEVEL		20.640	20.290 20.290	20.253 20.253	20.106 20.106	19.925 19.925	19.878 19.878	19.635 19.635	19.569 19.569	19.473 19.473	19.280 19.280	19.160 19.160	18.996 18.996	18.824 18.824	18.278 18.278	18.202
DEPTH (m)		1.553	0.629	0.697	1.399	1.185	1.130	1.231	1.304	1.394	1.431	1.764	2.005	2.201	1.603	1.503
DISTANCE (m)		21.01	3.15	12.50	15.37	5.28	27.84	8.91	8.39	25.63	16.07	22.15	17.21	49.20	7.65	
PIPE SLOPE		1:60	1:85	1:85	1:85	1:112	1:115	1:135	1:87	1:133	1:134	1:135	1:100	1:90	1:101	
PIPE SIZE		225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	



		FB-9-1	FB-9
COVER LEVEL		21.344	21.110
INVERT LEVEL		20.320	19.930
DEPTH (m)		1.024	1.185
DISTANCE (m)		32.66	
PIPE SLOPE		1:84	
PIPE SIZE		225mm	

NOTES:

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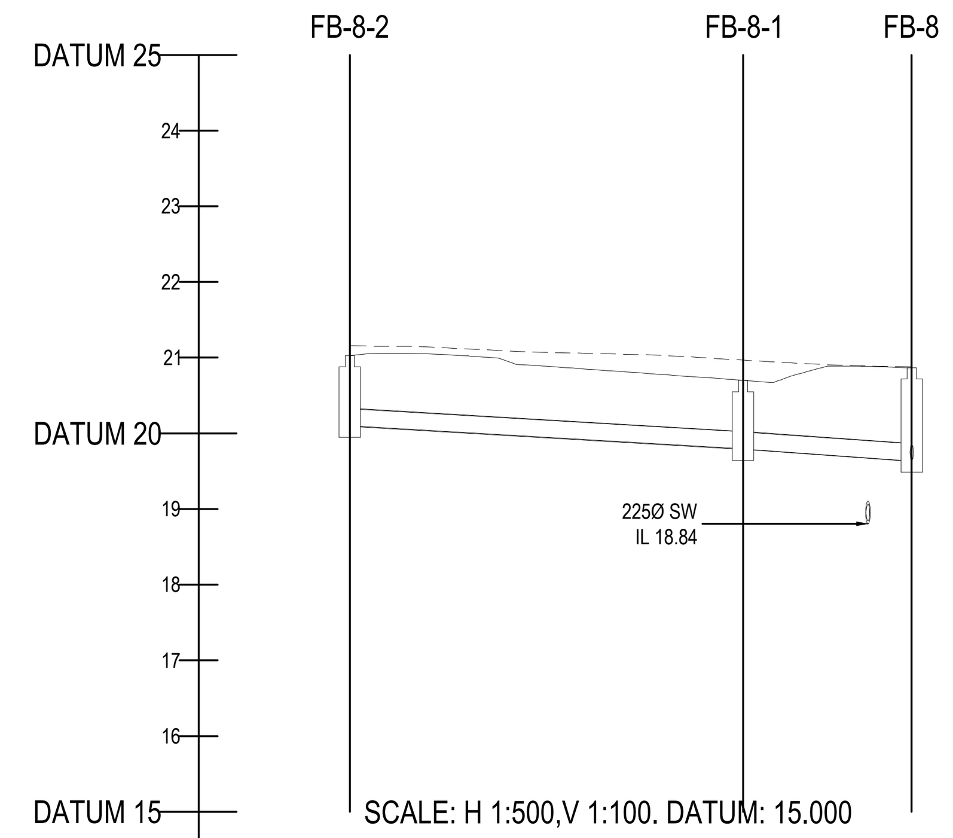
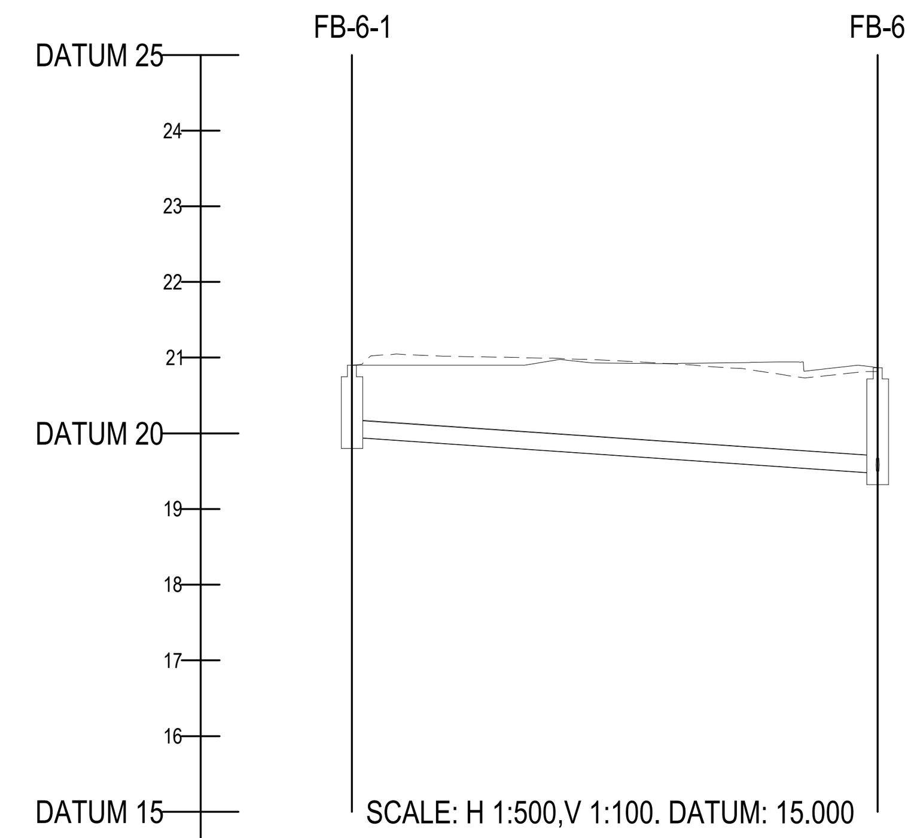
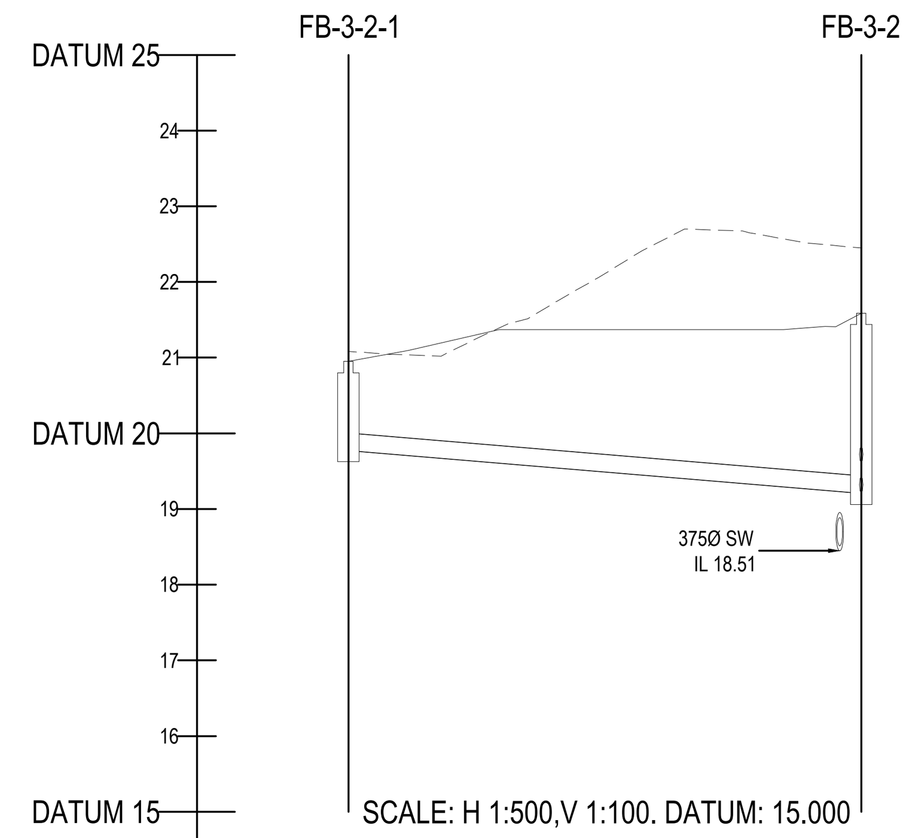
6. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
7. WHERE COVER TO PIPE IS LESS THAN 1200mm (ROAD/PATH/VERGE) OR 900mm (OPEN SPACE) SURROUND PIPE IN MINIMUM 150mm CONCRETE



		FB-8-2	FB-8-1	FB-8
COVER LEVEL		21.028	20.700	20.866
INVERT LEVEL		20.100	19.794 19.794	19.635
DEPTH (m)		0.928	0.906	1.231
DISTANCE (m)		25.99	11.15	
PIPE SLOPE		1:85	1:70	
PIPE SIZE		225mm	225mm	



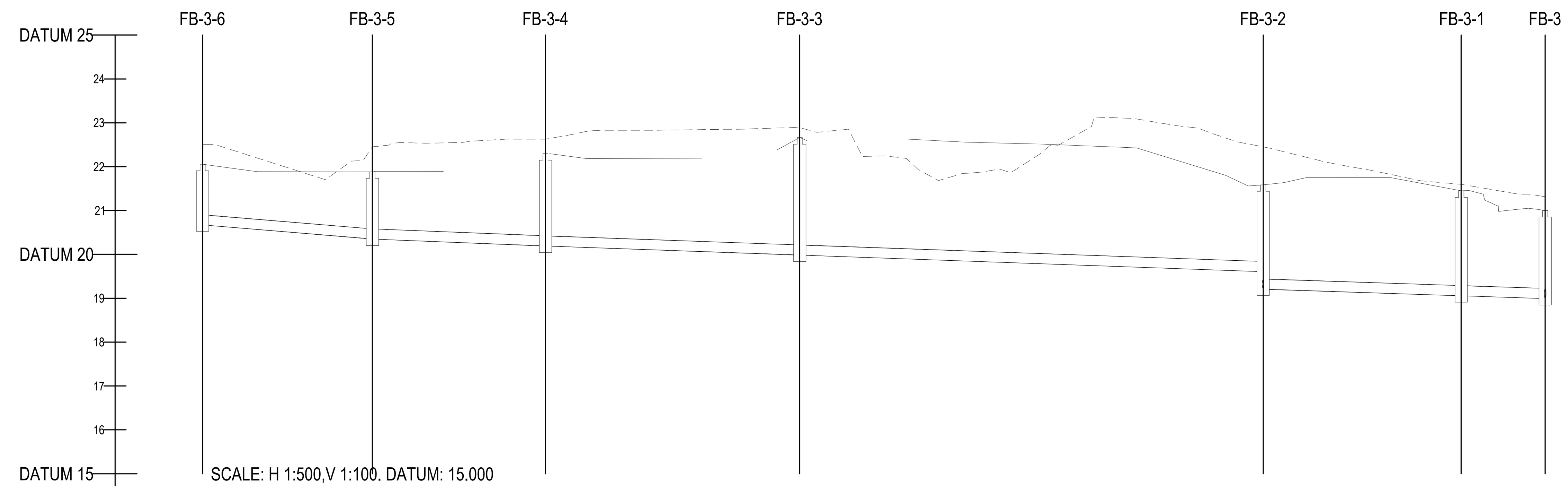
		FB-6-1	FB-6
COVER LEVEL		20.900	20.867
INVERT LEVEL		19.950	19.474
DEPTH (m)		0.950	1.394
DISTANCE (m)		34.73	
PIPE SLOPE		1:73	
PIPE SIZE		225mm	



		FB-3-2-1	FB-3-2
COVER LEVEL		20.950	21.586
INVERT LEVEL		19.775	19.210
DEPTH (m)		1.175	2.376
DISTANCE (m)		33.89	
PIPE SLOPE		1:60	
PIPE SIZE		225mm	

KEY

- - - - - - EXISTING GROUND PROFILE
———— PROPOSED GROUND PROFILE



		FB-3-6	FB-3-5	FB-3-4	FB-3-3	FB-3-2	FB-3-1	FB-3
COVER LEVEL		22.056	21.883	22.298	22.663	21.586	21.448	21.001
INVERT LEVEL		20.675	20.352 20.352	20.194 20.194	19.987 19.987	19.609 19.210	19.059 19.059	18.996
DEPTH (m)		1.381	1.531	2.104	2.676	2.376	2.389	2.005
DISTANCE (m)		19.37	19.75	29.02	52.88	22.60	9.58	
PIPE SLOPE		1:60	1:125	1:140	1:140	1:150	1:152	
PIPE SIZE		225mm	225mm	225mm	225mm	225mm	225mm	

rev	date	description	by	chkd.
1	07-11-25	SODA APPLICATION	HvH	SM
0	26-06-25	LRD APPLICATION	PGC	ED

STATUS CODES

purpose	acceptance
P3 - PLANNING PERMISSION	S - ISSUED

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DUBLIN | CORK | GALWAY | WATERFORD

project ref.
SANDFORD ROAD, MILLTOWN

drawing title
FOUL WATER LONGSECTIONS SHEET 2

client
SANDFORD LIVING LIMITED

designed by	author	scale	sheet size
EDA	RMC	AS SHOWN	A1

drawing no.	revision
190226-X-92-Z00-DTM-DR-DBFL-CE-3312	1

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ON ORIGINAL

0 5 10 20 30 40 50mm

NOTES

MATCH LINE

NORWOOD PARK

BELMONT AVENUE

EXISTING 9 INCH CAST IRON WATERMAIN

PROPOSED 200 DIAMETER CONNECTION

SLUCE VALVES AS PER IRISH WATER STANDARD DETAIL DRAWING NO. STD-W-14/15

METER CHAMBER AS PER IRISH WATER STANDARD DETAIL DRAWING NO. STD-W-26

WASHOUT HYDRANT ARRANGEMENT AS PER IRISH WATER STANDARD DETAIL DRAWING NO. STD-W-30/30A

HYDRANT AS PER IRISH WATER STANDARD DETAIL DRAWING NO. STD-W-16/18

HYDRANT AS PER IRISH WATER STANDARD DETAIL DRAWING NO. STD-W-17/19

METER CHAMBER AS PER IRISH WATER STANDARD DETAIL DRAWING NO. STD-W-26A

CONNECTION POINT TO BASEMENT PLANT ROOM TO SERVE BLOCK A1 TANK Ø54mm

CONNECTION POINT TO BASEMENT PLANT ROOM TO SERVE BLOCK B AND C TANKS Ø76MM

CONNECTION POINT TO BASEMENT PLANT ROOM TO SERVE SPRINKLER TANKS Ø100MM

REFER TO MECHANICAL ENGINEERS DRAWING FOR CONFIRMATION OF SLUNG WATERMAIN LAYOUT AND DETAILS

AIR VALVE AS PER IRISH WATER STANDARD DETAIL DRAWING NO. STD-W-22

INDIVIDUAL SERVICE CONNECTION FOR RESIDENTIAL AMENITIES

CONNECTION POINT TO BASEMENT PLANT ROOM TO SERVE BLOCKS A2, D, F TANKS Ø108mm

INCOMING MWS TO SERVE HOUSE AND THE CHAPEL Ø54mm

INDIVIDUAL SERVICE CONNECTION FOR CAFE Ø32mm

INCOMING MWS TO SERVE CRECHE IN BLOCK F Ø32mm

PROPOSED 200 DIAMETER CONNECTION

MILLTOWN ROAD

EXISTING 4"ø CAST IRON 1920 WATERMAIN

EXISTING 125 ø MDPE 1990 WATERMAIN

EXISTING 6" CAST IRON 1920 WATERMAIN

EXISTING 9" CAST IRON 1920 WATERMAIN

EXISTING 12" CAST IRON 1920 WATERMAIN

EXISTING 3" ø CAST IRON 1920 WATERMAIN

LEGEND

- APPLICATION BOUNDARY
- 32 ø WATERMAIN — Ø32mm WATERMAIN
- 54 ø WATERMAIN — Ø54mm WATERMAIN
- 76 ø WATERMAIN — Ø76mm WATERMAIN
- 100 ø WATERMAIN — Ø100mm WATERMAIN
- 150 ø WATERMAIN — Ø150mm WATERMAIN
- 150 ø WATERMAIN — SLUNG WATERMAIN
- 200 ø WATERMAIN — Ø200mm WATERMAIN
- SV — SLUICE VALVES AS PER IRISH WATER STANDARD DETAIL STD-W-14/15
- AV — AIR VALVE AS PER IRISH WATER STANDARD DETAIL STD-W-20/22
- B — BOUNDARY BOX AND 20mm OD PE80 SERVICE CONNECTION
- H — HYDRANTS AS PER IRISH WATER STANDARD DETAIL STD-W-16/18
- WOH — WASH OUT HYDRANTS AS PER IRISH WATER STANDARD DETAIL STD-W-30A
- Sc/V — SCOUR VALVE AS PER IRISH WATER STANDARD DETAIL STD-W-30
- M — METER CHAMBER AS PER IRISH WATER STANDARD STD-W-26
- K — FLOW METER KIOSK AS PER STD-W-36
- 9" CAST IRON — EXISTING WATERMAIN
- SV — EXISTING SLUICE VALVE
- H — EXISTING HYDRANT

LIST OF IRISH WATER STANDARD DETAILS BROUGHT INTO THE CONTRACT

STD-W-04	GENERAL PIPE CONNECTIONS (SHEET 1 OF 7)
STD-W-05	GENERAL PIPE CONNECTIONS (SHEET 2 OF 7)
STD-W-06	GENERAL PIPE CONNECTIONS (SHEET 3 OF 7)
STD-W-07	GENERAL PIPE CONNECTIONS (SHEET 4 OF 7)
STD-W-08	GENERAL PIPE CONNECTIONS (SHEET 5 OF 7)
STD-W-09	GENERAL PIPE CONNECTIONS (SHEET 6 OF 7)
STD-W-10	GENERAL PIPE CONNECTIONS (SHEET 7 OF 7)
STD-W-11	TYPICAL SERVICE LAYOUT INDICATING SEPARATION DISTANCES
STD-W-12	RESTRICTIONS ON TREES / SHRUBS PLANTING ADJACENT TO WATERMAINS
STD-W-13	TRENCH BACKFILL & BEDDING
STD-W-14	SLUICE VALVE FOR DUCTILE IRON (D.I.) PIPE (<350MM DIA.)(SHEET 1 OF 2)
STD-W-15	SLUICE VALUE FOR POLYETHYLENE (P.E.) PIPE (<350MM DIA.)(SHEET 2 OF 2)
STD-W-16	ON-LINE HYDRANT FOR DUCTILE IRON (D.I.) PIPE (SHEET 1 OF 4)
STD-W-17	OFF-LINE HYDRANT FOR DUCTILE IRON (D.I.) PIPE (SHEET 2 OF 4)
STD-W-18	ON-LINE HYDRANT FOR POLYETHYLENE (P.E.) PIPE (SHEET 3 OF 4)
STD-W-19	OFF-LINE HYDRANT FOR POLYETHYLENE (P.E.) PIPE (SHEET 4 OF 4)
STD-W-20	ON-LINE AIR VALVE FOR DUCTILE IRON (D.I.) PIPE (SHEET 1 OF 4)
STD-W-21	OFF-LINE AIR VALVE FOR DUCTILE IRON (D.I.) PIPE (SHEET 2 OF 4)
STD-W-22	ON-LINE AIR VALVE FOR POLYETHYLENE (P.E.) PIPE (SHEET 3 OF 4)
STD-W-23	OFF-LINE AIR VALVE FOR POLYETHYLENE (P.E.) PIPE (SHEET 4 OF 4)
STD-W-24	PRESSURE REDUCING / SUSTAINING VALVE (P.R.V. / P.S.V.) CHAMBER
STD-W-26	METER CHAMBER (≤300MM DIA.)
STD-W-27	MARKER POSTS / PLATES
STD-W-28	WATER MAIN THRUST & SUPPORT BLOCKS
STD-W-30	SCOUR CHAMBER & HEAD WALL ARRANGEMENTS
STD-W-30A	WASHOUT HYDRANT
STD-W-31	TYPICAL DITCH / STREAM CROSSING FOR WATER MAIN

GENERAL NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPENCIES BEFORE WORK COMMENCES
2. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF EXISTING DRAINAGE LEVELS AND LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SIT
3. ALL DIMENSIONS AND LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
4. ALL LEVELS ARE IN METERS AND ARE RELATED TO ORDINANCE DATUM. CO-ORDINATES RELATE TO ITM.

DRAWING SPECIFIC NOTES:

1. ALL WATERMAINS VALVES AND FITTINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE IRISH WATER STANDARD DETAILS AND IRISH WATER CODE OF PRACTICE FOR WATER INFRASTRUCTURE.
2. WATERMAINS SHALL BE HDPE, PE100, SDR17 TO IS EN 12201 PART 2:2011 AND IS EN 12201-3:2011 ALL SLUNG WATERMAIN MATERIAL TO M&E ENGINEERS SPECIFICATION.
3. CONNECTION BETWEEN EXISTING AND PROPOSED WATERMAINS TO BE CARRIED OUT IN ACCORDANCE WITH IRISH WATER STANDARD DETAILS STD-W-03 TO STD-W-10.
4. ANCHOR BLOCKS TO BE POSITIONED AT DEAD ENDS, TEES, BENDS AND AT EACH SIDE OF HYDRANTS AND VALVES IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER STANDARD DETAIL STD-W-28 (WATER MAIN THRUST AND SUPPORT BLOCKS.DISMANTLING JOINTS TO BE INSTALLED AT EACH SLUICE VALVE AS PER IRISH WATER STANDARD DETAIL STD-W-15.
5. CONNECTION TO INDIVIDUAL HOUSES IN ACCORDANCE WITH IRISH WATER STD-W-03.
6. INSTALLATION OF SLUICE VALVES, AIR VALVES AND HYDRANTS SHALL BE IN ACCORDANCE WITH IRISH WATER'S STANDARD DETAILS STD-W-14 TO STD-W-23.
7. MARKER POSTS AND PLATES ARE TO BE PROVIDED IN ACCORDANCE WITH IRISH WATER STANDARD DETAIL STD-W-27.
12. CONNECTION TO INDIVIDUAL HOUSES IN ACCORDANCE WITH IRISH WATER STD-W-03.
13. CONNECTION TO EXISTING WATERMAINS TO BE COORDINATED BY THE CONTRACTOR WITH IRISH WATER AND/OR THE LOCAL AUTHORITY.
14. CONTRACTOR TO LIASE WITH IRISH WATER AND / OR THE LOCAL AUTHORITY AS REQUIRED REGARDING TESTING, CLEANSING AND STERILISATION OF WATERMAINS
15. WATERMAINS TO BE PRESSURE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER AND IGN 4-01-03, GUIDE TO TESTING OF PRESSURE PIPES AND FITTINGS FOR USE BY PUBLIC WATER SUPPLIERS, OCTOBER 2015. A FORMAL TEST REPORT SHALL BE SUBMITTED TO THE ENGINEER DETAILING THE TEST CARRIED OUT.
16. AT 90 DEG. TURNS USE 2 NO. 45 DEG. BENDS
17. COVER TO WATERMAIN TO BE 900MM
18. HYDRANT OUTLET TO BE 200MM BELOW GROUND LEVEL UNLESS REQUESTED OTHERWISE
19. WHERE COVER TO PIPE IS LESS THAN 1200MM IN TRAFFICED AREAS, ENCASE PIPE IN 150 MM CONCRETE WITH MOVEMENT JOINTS
20. CONTRACTOR SHALL SATISFY THEMSELVES AS TO THE ACCURACY OF EXISTING SERVICES INFORMATION AND THE LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCING INSTALLATION OF WATERMAINS
21. WATERMAIN DIAMETERS SHOWN ON PLAN REFER TO MINIMUM INTERNAL DIAMETER

rev	date	description	by	chkd.
4	07-11-25	SODA APPLICATION	GDN	SM
3	05-11-25	GENERAL UPDATED	GDN	EJD
2	04-07-25	WATERMAIN ARRANGEMENT UPDATED	GDN	EJD
1	01-07-25	UPDATED LAYOUT	GDN	EJD
0	26-06-25	LRD APPLICATION	PGC	ED

STATUS CODES

purpose	acceptance
P3 - PLANNING PERMISSION	S - ISSUED

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T: + 353 1 400 4000 | E: info@dbfl.ie | W: www.dbfl.ie
DUBLIN | CORK | GALWAY | WATERFORD

project ref.
SANDFORD ROAD, MILLTOWN

drawing title
SITE WATERMAIN LAYOUT

client
SANDFORD LIVING LIMITED

designed by	author	scale	sheet size
BK	ICD	1:500	A1P

drawing no. 190226-X-93-Z00-DTM-DR-DBFL-CE-1311 | revision 4

Appendix E : Foul Drainage Calculations

FOUL SEWERAGE DESIGN

Design Criteria for FW_2

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Domestic (l/s/ha)	0.00	Maximum Backdrop Height (m)	1.500
Industrial Peak Flow Factor	0.00	Domestic Peak Flow Factor	6.00	Min Design Depth for Optimisation (m)	1.200
Calculation Method	EN 752	Add Flow / Climate Change (%)	20	Min Vel for Auto Design only (m/s)	0.75
Frequency Factor	0.50	Minimum Backdrop Height (m)	0.200	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for FW_2

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F7.000	45.014	0.750	60.0	0.000	132.0	0.0	1.500	o	225	Pipe/Conduit	
F7.001	36.486	0.365	100.0	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	
F7.002	39.070	0.488	80.1	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.003	42.392	0.707	60.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.004	10.858	0.220	49.4	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.000	19.750	0.000	0.0	132.0	1.1	52	0.99	1.48	59.0	6.9
F7.001	19.000	0.000	0.0	258.0	1.6	70	0.91	1.15	45.6	9.6
F7.002	18.635	0.000	0.0	258.0	1.6	66	0.99	1.28	51.0	9.6
F7.003	18.147	0.000	0.0	258.0	1.6	62	1.09	1.48	59.0	9.6
F7.004	17.440	0.000	0.0	258.0	1.6	58	1.17	1.64	65.1	9.6

Network Design Table for FW_2

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F8.000	10.239	0.150	68.3	0.000	435.0	0.0	1.500	o	225	Pipe/Conduit	
F7.005	17.718	0.364	48.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F9.000	17.690	0.208	85.0	0.000	417.0	0.0	1.500	o	225	Pipe/Conduit	
F9.001	22.422	0.249	90.0	0.000	45.0	0.0	1.500	o	225	Pipe/Conduit	
F7.006	34.135	0.322	106.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F10.000	36.719	0.210	174.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F8.000	17.370	0.000	0.0	435.0	2.1	73	1.12	1.39	55.3	12.5
F7.005	17.220	0.000	0.0	693.0	2.6	75	1.36	1.65	65.5	15.8
F9.000	17.524	0.000	0.0	417.0	2.0	76	1.03	1.25	49.5	12.3
F9.001	17.316	0.000	0.0	462.0	2.1	79	1.03	1.21	48.1	12.9
F7.006	16.856	0.000	0.0	1155.0	3.4	107	1.09	1.11	44.3	20.4
F10.000	17.207	0.000	0.0	0.0	0.0	0	0.00	0.87	34.5	0.0

Network Design Table for FW_2

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F7.007	13.321	0.078	170.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F11.000	5.732	0.029	197.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F11.001	38.547	0.335	115.1	0.000	99.0	0.0	1.500	o	225	Pipe/Conduit	
F11.002	13.115	0.114	115.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F11.003	11.556	0.075	154.1	0.000	99.0	0.0	1.500	o	225	Pipe/Conduit	
F11.004	27.623	0.180	153.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F11.005	7.128	0.046	155.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F11.006	18.022	0.116	155.4	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.008	27.257	0.136	200.4	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.009	5.956	0.030	198.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.007	16.534	0.000	0.0	1155.0	3.4	124	0.91	0.88	34.9	20.4
F11.000	17.100	0.000	0.0	0.0	0.0	0	0.00	0.81	32.4	0.0
F11.001	17.071	0.000	0.0	99.0	1.0	57	0.75	1.07	42.5	6.0
F11.002	16.736	0.000	0.0	99.0	1.0	57	0.75	1.07	42.5	6.0
F11.003	16.622	0.000	0.0	198.0	1.4	73	0.75	0.92	36.7	8.4
F11.004	16.547	0.000	0.0	198.0	1.4	73	0.75	0.93	36.8	8.4
F11.005	16.367	0.000	0.0	198.0	1.4	73	0.75	0.92	36.6	8.4
F11.006	16.321	0.000	0.0	198.0	1.4	73	0.75	0.92	36.6	8.4
F7.008	16.205	0.000	0.0	1353.0	3.7	137	0.87	0.81	32.2	22.1
F7.009	16.069	0.000	0.0	1353.0	3.7	136	0.87	0.81	32.3	22.1

Manhole Schedules for FW_2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FA-10	21.120	1.370	Open Manhole	1200	F7.000	19.750	225				
FA-9	20.838	1.838	Open Manhole	1200	F7.001	19.000	225	F7.000	19.000	225	
FA-8	19.518	0.883	Open Manhole	1200	F7.002	18.635	225	F7.001	18.635	225	
FA-7	19.000	0.853	Open Manhole	1200	F7.003	18.147	225	F7.002	18.147	225	
FA-6	19.100	1.660	Open Manhole	1200	F7.004	17.440	225	F7.003	17.440	225	
FA-5-1	18.933	1.563	Open Manhole	1200	F8.000	17.370	225				
FA-5	18.818	1.598	Open Manhole	1200	F7.005	17.220	225	F7.004	17.220	225	
								F8.000	17.220	225	
FA-4-2	18.740	1.216	Open Manhole	1200	F9.000	17.524	225				
FA-4-1	18.791	1.475	Open Manhole	1200	F9.001	17.316	225	F9.000	17.316	225	
FA-4	18.793	1.937	Open Manhole	1200	F7.006	16.856	225	F7.005	16.856	225	
								F9.001	17.067	225	211
FA-3-1	18.207	1.000	Open Manhole	1200	F10.000	17.207	225				
FA-3	18.534	2.000	Open Manhole	1200	F7.007	16.534	225	F7.006	16.534	225	
								F10.000	16.997	225	463
FA-2-7	18.465	1.365	Open Manhole	1200	F11.000	17.100	225				
FA-2-6	18.470	1.399	Open Manhole	1200	F11.001	17.071	225	F11.000	17.071	225	
FA-2-5	18.003	1.267	Open Manhole	1200	F11.002	16.736	225	F11.001	16.736	225	
FA-2-4	18.000	1.378	Open Manhole	1200	F11.003	16.622	225	F11.002	16.622	225	
FA-2-3	17.942	1.395	Open Manhole	1200	F11.004	16.547	225	F11.003	16.547	225	
FA-2-2	18.371	2.004	Open Manhole	1200	F11.005	16.367	225	F11.004	16.367	225	
FA-2-1	18.375	2.054	Open Manhole	1200	F11.006	16.321	225	F11.005	16.321	225	

Manhole Schedules for FW_2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FA-2	18.378	2.173	Open Manhole	1200	F7.008	16.205	225	F7.007	16.456	225	251
								F11.006	16.205	225	
FA-1	18.049	1.980	Open Manhole	1200	F7.009	16.069	225	F7.008	16.069	225	
FA-0	17.906	1.867	Open Manhole	0		OUTFALL		F7.009	16.039	225	

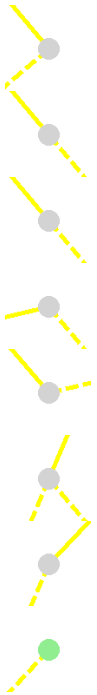
MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FA-10	716878.618	731223.101	716878.618	731223.101	Required	
FA-9	716889.045	731266.891	716889.045	731266.891	Required	
FA-8	716902.085	731300.967	716902.085	731300.967	Required	
FA-7	716938.993	731288.150	716938.993	731288.150	Required	
FA-6	716978.743	731273.418	716978.743	731273.418	Required	

Manhole Schedules for FW_2

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FA-5-1	716983.177	731264.780	716983.177	731264.780	Required	
FA-5	716989.582	731272.768	716989.582	731272.768	Required	
FA-4-2	717002.660	731257.059	717002.660	731257.059	Required	
FA-4-1	717015.544	731269.180	717015.544	731269.180	Required	
FA-4	717001.041	731286.280	717001.041	731286.280	Required	
FA-3-1	717036.098	731290.500	717036.098	731290.500	Required	
FA-3	717012.335	731318.493	717012.335	731318.493	Required	
FA-2-7	717036.208	731249.943	717036.208	731249.943	Required	
FA-2-6	717040.549	731253.687	717040.549	731253.687	Required	

Manhole Schedules for FW_2

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FA-2-5	717069.861	731278.721	717069.861	731278.721	Required	
FA-2-4	717061.412	731288.752	717061.412	731288.752	Required	
FA-2-3	717053.964	731297.588	717053.964	731297.588	Required	
FA-2-2	717036.181	731318.726	717036.181	731318.726	Required	
FA-2-1	717029.245	731317.081	717029.245	731317.081	Required	
FA-2	717017.517	731330.765	717017.517	731330.765	Required	
FA-1	717028.199	731355.841	717028.199	731355.841	Required	
FA-0	717032.260	731360.197			No Entry	



Free Flowing Outfall Details for FW_2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F7.009	FA-0	17.906	16.039	16.039	0	0

Ormond House
Upper Ormond Quay
Dublin 7

Date 19/11/2025 17:21
File 190226 New Network 13.11.25.MDX

Designed by mwanikis
Checked by

Innovyze | Network 2020.1.3

FOUL SEWERAGE DESIGN

Design Criteria for FW_1

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Domestic (l/s/ha)	0.00	Maximum Backdrop Height (m)	1.500
Industrial Peak Flow Factor	0.00	Domestic Peak Flow Factor	6.00	Min Design Depth for Optimisation (m)	1.200
Calculation Method	EN 752	Add Flow / Climate Change (%)	20	Min Vel for Auto Design only (m/s)	0.75
Frequency Factor	0.50	Minimum Backdrop Height (m)	0.200	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for FW_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	21.008	0.350	60.0	0.000	48.0	0.0	1.500	o	225	Pipe/Conduit	
F1.001	3.151	0.037	85.2	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.002	13.050	0.147	88.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.003	15.423	0.181	85.2	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	20.640	0.000	0.0	48.0	0.7	40	0.85	1.48	59.0	4.2
F1.001	20.290	0.000	0.0	48.0	0.7	44	0.75	1.24	49.5	4.2
F1.002	20.253	0.000	0.0	48.0	0.7	45	0.74	1.22	48.5	4.2
F1.003	20.106	0.000	0.0	48.0	0.7	44	0.75	1.24	49.5	4.2

Ormond House
Upper Ormond Quay
Dublin 7

Date 19/11/2025 17:21
File 190226 New Network 13.11.25.MDX

Designed by mwanikis
Checked by

Innovyze | Network 2020.1.3

Network Design Table for FW_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F2.000	31.457	0.390	80.7	0.000	45.0	0.0	1.500	o	225	Pipe/Conduit	
F1.004	3.925	0.047	83.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.005	28.910	0.243	119.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F3.000	25.988	0.306	84.9	0.000	45.0	0.0	1.500	o	225	Pipe/Conduit	
F3.001	9.209	0.159	57.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.006	10.946	0.066	165.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.007	8.393	0.096	87.4	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F2.000	20.320	0.000	0.0	45.0	0.7	43	0.76	1.28	50.8	4.0
F1.004	19.925	0.000	0.0	93.0	1.0	52	0.84	1.26	50.0	5.8
F1.005	19.878	0.000	0.0	93.0	1.0	57	0.74	1.05	41.8	5.8
F3.000	20.100	0.000	0.0	45.0	0.7	44	0.75	1.25	49.5	4.0
F3.001	19.794	0.000	0.0	45.0	0.7	40	0.85	1.51	60.0	4.0
F1.006	19.635	0.000	0.0	138.0	1.2	68	0.69	0.89	35.4	7.0
F1.007	19.569	0.000	0.0	138.0	1.2	58	0.87	1.23	48.8	7.0

Network Design Table for FW_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F4.000	34.728	0.476	73.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.008	25.635	0.193	132.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.009	16.068	0.120	133.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.010	22.153	0.164	135.1	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F5.000	19.371	0.323	60.0	0.000	39.0	0.0	1.500	o	225	Pipe/Conduit	
F5.001	19.747	0.158	125.0	0.000	75.0	0.0	1.500	o	225	Pipe/Conduit	
F5.002	29.019	0.207	140.2	0.000	39.0	0.0	1.500	o	225	Pipe/Conduit	
F5.003	52.884	0.378	139.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F4.000	19.950	0.000	0.0	0.0	0.0	0	0.00	1.34	53.5	0.0
F1.008	19.473	0.000	0.0	138.0	1.2	64	0.75	1.00	39.6	7.0
F1.009	19.280	0.000	0.0	138.0	1.2	64	0.75	0.99	39.4	7.0
F1.010	19.160	0.000	0.0	138.0	1.2	65	0.75	0.99	39.2	7.0
F5.000	20.675	0.000	0.0	39.0	0.6	39	0.83	1.48	59.0	3.7
F5.001	20.352	0.000	0.0	114.0	1.1	60	0.75	1.03	40.8	6.4
F5.002	20.194	0.000	0.0	153.0	1.2	67	0.75	0.97	38.5	7.4
F5.003	19.987	0.000	0.0	153.0	1.2	67	0.75	0.97	38.6	7.4

Network Design Table for FW_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F6.000	33.888	0.565	60.0	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F5.004	22.601	0.151	149.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F5.005	9.585	0.063	152.1	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.011	17.210	0.172	100.1	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.012	49.199	0.546	90.1	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.013	7.648	0.076	100.6	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F6.000	19.775	0.000	0.0	42.0	0.6	39	0.83	1.48	59.0	3.9
F5.004	19.210	0.000	0.0	195.0	1.4	73	0.76	0.94	37.3	8.4
F5.005	19.059	0.000	0.0	195.0	1.4	73	0.75	0.93	37.0	8.4
F1.011	18.996	0.000	0.0	333.0	1.8	75	0.94	1.15	45.6	10.9
F1.012	18.824	0.000	0.0	333.0	1.8	73	0.98	1.21	48.1	10.9
F1.013	18.278	0.000	0.0	333.0	1.8	75	0.94	1.14	45.5	10.9

Manhole Schedules for FW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FB-13	21.898	1.258	Open Manhole	1200	F1.000	20.640	225				
FB-12	20.908	0.618	Open Manhole	1200	F1.001	20.290	225	F1.000	20.290	225	
FB-11	20.922	0.669	Open Manhole	1200	F1.002	20.253	225	F1.001	20.253	225	
FB-10	21.278	1.172	Open Manhole	1200	F1.003	20.106	225	F1.002	20.106	225	
FB-9-1	21.293	0.973	Open Manhole	1200	F2.000	20.320	225				
FB-9	21.047	1.122	Open Manhole	1200	F1.004	19.925	225	F1.003	19.925	225	
								F2.000	19.930	225	5
FB-8A	20.957	1.079	Open Manhole	1200	F1.005	19.878	225	F1.004	19.878	225	
FB-8-2	21.150	1.050	Open Manhole	1200	F3.000	20.100	225				
FB-8-1	20.711	0.917	Open Manhole	1200	F3.001	19.794	225	F3.000	19.794	225	
FB-8	20.866	1.231	Open Manhole	1200	F1.006	19.635	225	F1.005	19.635	225	
								F3.001	19.635	225	
FB-7	20.872	1.303	Open Manhole	1200	F1.007	19.569	225	F1.006	19.569	225	
FB-6-1	20.900	0.950	Open Manhole	1200	F4.000	19.950	225				
FB-6	20.799	1.326	Open Manhole	1200	F1.008	19.473	225	F1.007	19.473	225	
								F4.000	19.474	225	1
FB-5	20.711	1.431	Open Manhole	1200	F1.009	19.280	225	F1.008	19.280	225	
FB-4	20.924	1.764	Open Manhole	1200	F1.010	19.160	225	F1.009	19.160	225	
FB-3-6	22.056	1.381	Open Manhole	1200	F5.000	20.675	225				
FB-3-5	21.883	1.531	Open Manhole	1200	F5.001	20.352	225	F5.000	20.352	225	
FB-3-4	22.398	2.204	Open Manhole	1200	F5.002	20.194	225	F5.001	20.194	225	

Manhole Schedules for FW_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FB-3-3	22.663	2.676	Open Manhole	1200	F5.003	19.987	225	F5.002	19.987	225	
FB-3-2-1	21.015	1.240	Open Manhole	1200	F6.000	19.775	225				
FB-3-2	21.585	2.375	Open Manhole	1200	F5.004	19.210	225	F5.003	19.609	225	399
								F6.000	19.210	225	
FB-3-1	21.448	2.389	Open Manhole	1200	F5.005	19.059	225	F5.004	19.059	225	
FB-3	21.001	2.005	Open Manhole	1200	F1.011	18.996	225	F1.010	18.996	225	
								F5.005	18.996	225	
FB-2	21.017	2.193	Open Manhole	1200	F1.012	18.824	225	F1.011	18.824	225	
13	19.881	1.603	Open Manhole	1200	F1.013	18.278	225	F1.012	18.278	225	
FB-0	19.705	1.503	Open Manhole	0		OUTFALL		F1.013	18.202	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FB-13	716882.729	731112.338	716882.729	731112.338	Required	
FB-12	716890.451	731131.876	716890.451	731131.876	Required	

Manhole Schedules for FW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FB-11	716887.540	731133.080	716887.540	731133.080	Required	
FB-10	716882.324	731145.042	716882.324	731145.042	Required	
FB-9-1	716858.364	731171.380	716858.364	731171.380	Required	
FB-9	716887.518	731159.564	716887.518	731159.564	Required	
FB-8A	716891.440	731159.407	716891.440	731159.407	Required	
FB-8-2	716871.555	731203.056	716871.555	731203.056	Required	
FB-8-1	716895.079	731192.012	716895.079	731192.012	Required	
FB-8	716902.242	731186.223	716902.242	731186.223	Required	
FB-7	716912.531	731182.488	716912.531	731182.488	Required	

Manhole Schedules for FW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FB-6-1	716907.643	731151.283	716907.643	731151.283	Required	
FB-6	716920.875	731183.392	716920.875	731183.392	Required	
FB-5	716945.030	731174.810	716945.030	731174.810	Required	
FB-4	716948.695	731159.166	716948.695	731159.166	Required	
FB-3-6	716894.014	731104.857	716894.014	731104.857	Required	
FB-3-5	716912.077	731097.862	716912.077	731097.862	Required	
FB-3-4	716904.958	731079.442	716904.958	731079.442	Required	
FB-3-3	716932.031	731068.995	716932.031	731068.995	Required	
FB-3-2-1	716918.104	731131.577	716918.104	731131.577	Required	

Manhole Schedules for FW_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FB-3-2	716949.531	731118.900	716949.531	731118.900	Required	
FB-3-1	716958.223	731139.762	716958.223	731139.762	Required	
FB-3	716966.011	731145.349	716966.011	731145.349	Required	
FB-2	716979.356	731134.480	716979.356	731134.480	Required	
13	717015.128	731168.257	717015.128	731168.257	Required	
FB-0	717022.713	731167.282			No Entry	

Free Flowing Outfall Details for FW_1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.013	FB-0	19.705	18.202	18.202	0	0