

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales			
Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.700	Add Flow / Climate Change (%)	0
Ratio R	0.438	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

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
S2.000	18.344	0.065	282.2	0.170	15.00	0.0	0.600	o	600	Pipe/Conduit	
S2.001	16.775	0.035	479.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.002	14.895	0.030	496.5	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.003	57.910	0.115	503.6	0.280	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.004	5.566	0.015	371.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.005	15.840	0.250	63.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.000	3.448	0.015	229.9	0.000	15.00	0.0	0.600	o	600	Pipe/Conduit	
S3.001	10.000	0.020	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.002	8.935	0.085	105.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S4.000	4.463	0.015	297.5	0.000	15.00	0.0	0.600	o	600	Pipe/Conduit	
S4.001	35.554	0.075	474.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S4.002	20.704	0.050	414.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.003	30.187	0.410	73.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.006	10.146	0.020	507.3	0.064	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.007	24.105	0.050	482.1	0.064	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.008	18.380	0.040	459.5	0.064	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.000	50.00	15.21	27.840	0.170	0.0	0.0	0.0	1.44	408.4	23.0
S2.001	50.00	15.46	27.775	0.170	0.0	0.0	0.0	1.11	312.6	23.0
S2.002	50.00	15.69	27.740	0.170	0.0	0.0	0.0	1.09	307.1	23.0
S2.003	50.00	16.59	27.710	0.450	0.0	0.0	0.0	1.08	304.9	60.9
S2.004	50.00	16.66	27.595	0.450	0.0	0.0	0.0	1.26	355.7	60.9
S2.005	50.00	16.75	27.580	0.450	0.0	0.0	0.0	3.06	866.0	60.9
S3.000	50.00	15.04	27.860	0.000	0.0	0.0	0.0	1.60	452.9	0.0
S3.001	50.00	15.19	27.845	0.000	0.0	0.0	0.0	1.08	306.0	0.0
S3.002	50.00	15.25	27.825	0.000	0.0	0.0	0.0	2.38	671.5	0.0
S4.000	50.00	15.05	27.880	0.000	0.0	0.0	0.0	1.41	397.7	0.0
S4.001	50.00	15.59	27.865	0.000	0.0	0.0	0.0	1.11	314.3	0.0
S4.002	50.00	15.88	27.790	0.000	0.0	0.0	0.0	1.19	336.6	0.0
S3.003	50.00	16.05	27.740	0.000	0.0	0.0	0.0	2.84	803.1	0.0
S2.006	50.00	16.91	27.330	0.514	0.0	0.0	0.0	1.07	303.8	69.6
S2.007	50.00	17.27	27.310	0.578	0.0	0.0	0.0	1.10	311.7	78.3
S2.008	50.00	17.54	27.260	0.642	0.0	0.0	0.0	1.13	319.3	86.9

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S2.009	18.997	0.040	474.9	0.049	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.010	5.879	0.015	391.9	0.149	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.011	36.287	0.075	483.8	0.149	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.000	2.474	0.010	247.4	0.000	15.00	0.0	0.600	o	600	Pipe/Conduit	
S5.001	15.000	0.030	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.002	4.921	0.010	492.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.003	10.336	0.340	30.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.012	14.277	0.030	475.9	0.149	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.013	22.308	0.045	495.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S2.014	33.721	0.220	153.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.000	11.051	0.040	276.3	0.143	15.00	0.0	0.600	o	600	Pipe/Conduit	
S6.001	26.639	0.055	484.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.002	33.236	0.070	474.8	0.000	0.00	9.6	0.600	o	600	Pipe/Conduit	
S6.003	15.504	0.035	443.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.004	29.496	0.060	491.6	0.108	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.005	20.251	0.045	450.0	0.137	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.006	5.627	0.015	375.1	0.117	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.007	43.998	0.090	488.9	0.141	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.008	3.420	0.010	342.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.009	8.628	0.020	431.4	0.134	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.010	36.581	0.075	487.7	0.134	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.011	18.945	0.040	473.6	0.134	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.012	19.968	0.040	499.2	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.013	10.602	0.030	353.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.014	26.512	0.380	69.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.009	50.00	17.83	27.220	0.691	0.0	0.0	0.0	1.11	314.0	93.6
S2.010	50.00	17.91	27.180	0.840	0.0	0.0	0.0	1.22	346.1	113.7
S2.011	50.00	18.46	27.165	0.989	0.0	0.0	0.0	1.10	311.1	133.9
S5.000	50.00	15.03	27.480	0.000	0.0	0.0	0.0	1.54	436.5	0.0
S5.001	50.00	15.26	27.470	0.000	0.0	0.0	0.0	1.08	306.0	0.0
S5.002	50.00	15.33	27.440	0.000	0.0	0.0	0.0	1.09	308.5	0.0
S5.003	50.00	15.37	27.430	0.000	0.0	0.0	0.0	4.43	1251.9	0.0
S2.012	50.00	18.67	27.090	1.138	0.0	0.0	0.0	1.11	313.7	154.1
S2.013	50.00	19.01	27.060	1.138	0.0	0.0	0.0	1.09	307.3	154.1
S2.014	50.00	19.30	27.015	1.138	0.0	0.0	0.0	1.96	555.5	154.1
S6.000	50.00	15.13	27.800	0.143	0.0	0.0	0.0	1.46	412.8	19.4
S6.001	50.00	15.53	27.760	0.143	0.0	0.0	0.0	1.10	310.9	19.4
S6.002	50.00	16.03	27.705	0.143	9.6	0.0	0.0	1.11	314.1	29.0
S6.003	50.00	16.25	27.635	0.143	9.6	0.0	0.0	1.15	325.3	29.0
S6.004	50.00	16.70	27.600	0.251	9.6	0.0	0.0	1.09	308.6	43.6
S6.005	50.00	17.00	27.540	0.388	9.6	0.0	0.0	1.14	322.7	62.1
S6.006	50.00	17.07	27.495	0.505	9.6	0.0	0.0	1.25	353.8	78.0
S6.007	50.00	17.74	27.480	0.646	9.6	0.0	0.0	1.09	309.5	97.1
S6.008	50.00	17.79	27.390	0.646	9.6	0.0	0.0	1.31	370.7	97.1
S6.009	50.00	17.91	27.380	0.780	9.6	0.0	0.0	1.17	329.7	115.2
S6.010	50.00	18.47	27.360	0.914	9.6	0.0	0.0	1.10	309.8	133.4
S6.011	50.00	18.75	27.285	1.048	9.6	0.0	0.0	1.11	314.5	151.5
S6.012	50.00	19.06	27.245	1.048	9.6	0.0	0.0	1.08	306.2	151.5
S6.013	50.00	19.20	27.205	1.048	9.6	0.0	0.0	1.29	364.6	151.5
S6.014	50.00	19.35	27.175	1.048	9.6	0.0	0.0	2.92	825.1	151.5

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S2.015	11.187	0.075	150.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit		
S7.000	28.350	0.095	298.4	0.202	15.00	0.0	0.600	o	600	Pipe/Conduit		
S7.001	33.211	0.115	288.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.002	23.467	0.080	293.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.003	31.168	0.130	239.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S8.000	27.724	0.095	291.8	0.202	15.00	0.0	0.600	o	600	Pipe/Conduit		
S8.001	23.503	0.090	261.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S8.002	13.472	0.235	57.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.004	22.504	0.100	225.0	0.187	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.005	10.533	0.055	191.5	0.187	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.006	9.936	0.055	180.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.007	7.024	0.060	117.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.008	21.031	0.120	175.3	0.056	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.009	9.863	0.050	197.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.010	39.188	0.140	279.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.011	35.220	0.130	270.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S7.012	32.730	0.150	218.2	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
S2.016	5.324	0.035	152.1	0.000	0.00	0.0	0.600	o	675	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)
S2.015	50.00	19.43	26.720	2.186	9.6	0.0	0.0	2.14	765.0	305.6
S7.000	50.00	15.34	28.000	0.202	0.0	0.0	0.0	1.40	397.1	27.4
S7.001	50.00	15.72	27.905	0.202	0.0	0.0	0.0	1.43	403.7	27.4
S7.002	50.00	16.00	27.790	0.202	0.0	0.0	0.0	1.42	400.6	27.4
S7.003	50.00	16.33	27.710	0.202	0.0	0.0	0.0	1.57	443.4	27.4
S8.000	50.00	15.33	28.000	0.202	0.0	0.0	0.0	1.42	401.6	27.4
S8.001	50.00	15.59	27.905	0.202	0.0	0.0	0.0	1.50	424.7	27.4
S8.002	50.00	15.66	27.815	0.202	0.0	0.0	0.0	3.22	910.6	27.4
S7.004	50.00	16.56	27.580	0.591	0.0	0.0	0.0	1.62	457.8	80.0
S7.005	50.00	16.66	27.480	0.778	0.0	0.0	0.0	1.76	496.6	105.4
S7.006	50.00	16.75	27.425	0.778	0.0	0.0	0.0	1.81	511.4	105.4
S7.007	50.00	16.81	27.370	0.778	0.0	0.0	0.0	2.25	636.1	105.4
S7.008	50.00	17.00	27.310	0.834	0.0	0.0	0.0	1.84	519.3	112.9
S7.009	50.00	17.09	27.190	0.834	0.0	0.0	0.0	1.73	489.2	112.9
S7.010	50.00	17.54	27.140	0.834	0.0	0.0	0.0	1.45	410.1	112.9
S7.011	50.00	17.94	27.000	0.834	0.0	0.0	0.0	1.47	416.9	112.9
S7.012	50.00	18.27	26.870	0.834	0.0	0.0	0.0	1.64	465.0	112.9
S2.016	50.00	19.48	26.645	3.020	9.6	0.0	0.0	2.12	759.6	418.5

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,I (mm)	W (mm)
S2.016	SAssumed Existing Outfall	30.120	26.610	0.000	0	0

HDR		Page 4
7th Floor 240 Blackfriars Road London, UK, SE1 8NW	UNION PARK NORTH HYDE GARDENS DRAINAGE CALCULATIONS	
Date 18/04/2023	Designed by U GROENEWALD	
File Entire Site simulation edited without e...	Checked by C RYAN	
Innovyze	Network 2020.1	

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.700	Storm Duration (mins)	15
Ratio R	0.438		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S16, DS/PN: S2.015, Volume (m³): 23.7

Unit Reference	MD-SHE-0255-4490-2875-4490
Design Head (m)	2.875
Design Flow (l/s)	44.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	255
Invert Level (m)	26.720
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.875	44.9	Kick-Flo®	1.753	35.4
Flush-Flo™	0.830	44.8	Mean Flow over Head Range	-	39.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.2	0.800	44.8	2.000	37.7	4.000	52.6	7.000	69.0
0.200	26.1	1.000	44.5	2.200	39.5	4.500	55.7	7.500	71.4
0.300	38.0	1.200	43.6	2.400	41.1	5.000	58.6	8.000	73.7
0.400	41.0	1.400	42.0	2.600	42.8	5.500	61.4	8.500	75.9
0.500	42.9	1.600	39.1	3.000	45.8	6.000	64.1	9.000	78.0
0.600	44.0	1.800	35.8	3.500	49.3	6.500	66.6	9.500	80.1

Hydro-Brake® Optimum Manhole: S57, DS/PN: S7.006, Volume (m³): 7.1

Unit Reference	MD-SHE-0133-9300-1500-9300
Design Head (m)	1.500
Design Flow (l/s)	9.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	133
Invert Level (m)	27.425
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	9.3	Kick-Flo®	0.927	7.4
Flush-Flo™	0.438	9.3	Mean Flow over Head Range	-	8.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.8	0.800	8.5	2.000	10.6	4.000	14.8	7.000	19.3
0.200	8.4	1.000	7.7	2.200	11.1	4.500	15.7	7.500	20.0
0.300	9.1	1.200	8.4	2.400	11.6	5.000	16.5	8.000	20.6
0.400	9.3	1.400	9.0	2.600	12.1	5.500	17.2	8.500	21.2
0.500	9.3	1.600	9.6	3.000	12.9	6.000	18.0	9.000	21.8
0.600	9.1	1.800	10.1	3.500	13.9	6.500	18.7	9.500	22.4

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S2.004

Invert Level (m) 27.595 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	265.0	265.0	2.000	265.0	497.0	2.001	0.0	497.0

Cellular Storage Manhole: S12, DS/PN: S4.002

Invert Level (m) 27.790 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	225.0	225.0	1.000	225.0	285.0	1.001	0.0	285.0

Cellular Storage Manhole: S13, DS/PN: S2.012

Invert Level (m) 27.290 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	189.0	189.0	2.000	189.0	375.0	2.001	0.0	375.0

Cellular Storage Manhole: S27, DS/PN: S6.007

Invert Level (m) 27.480 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	198.0	198.0	2.000	198.0	392.0	2.001	0.0	392.0

Cellular Storage Manhole: S33, DS/PN: S6.013

Invert Level (m) 27.205 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	252.0	252.0	2.000	252.0	494.0	2.001	0.0	494.0

Dry Swale Manhole: S34, DS/PN: S6.014

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

Infiltration Coefficient Base (m/hr)	0.00000	Trench Infiltration Side (m/hr)	0.00000
Infiltration Coefficient Side (m/hr)	0.00000	Trench Porosity	0.30
Safety Factor	2.0	Side Slope (1:X)	3.0
Porosity	1.00	Slope (1:X)	150.0
Invert Level (m)	27.175	Cap Volume Depth (m)	0.800
Trench Height (m)	1.500	Cap Infiltration Depth (m)	0.000
Trench Width (m)	2.0	Include Swale Volume	Yes
Trench Length (m)	300.0		

Cellular Storage Manhole: S16, DS/PN: S2.015

Invert Level (m) 26.720 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	82.5	82.5	2.000	82.5	168.5	2.001	0.0	168.5

Cellular Storage Manhole: S54, DS/PN: S7.003

Invert Level (m) 27.710 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	90.0	90.0	1.000	90.0	132.0	1.001	0.0	132.0

Cellular Storage Manhole: S57, DS/PN: S7.006

Invert Level (m) 27.425 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	420.0	400.0	2.000	420.0	560.0	2.001	0.0	560.0

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.700 Cv (Summer) 0.750
Region England and Wales Ratio R 0.438 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

									Water	Surcharged	Flooded	
PN	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume
	Name	Storm	Period	Change		Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)
S2.000	S1	30 Winter		1	+0%					27.936	-0.504	0.000
S2.001	S2	30 Winter		1	+0%					27.904	-0.471	0.000
S2.002	S3	15 Winter		1	+0%					27.881	-0.459	0.000
S2.003	S4	15 Winter		1	+0%					27.869	-0.441	0.000
S2.004	S5	60 Winter		1	+0%					27.702	-0.493	0.000
S2.005	S6	60 Winter		1	+0%					27.649	-0.531	0.000
S3.000	S7	15 Summer		1	+0%					27.860	-0.600	0.000
S3.001	S8	15 Summer		1	+0%					27.845	-0.600	0.000
S3.002	S9	15 Summer		1	+0%					27.825	-0.600	0.000
S4.000	S10	15 Summer		1	+0%					27.880	-0.600	0.000
S4.001	S11	15 Summer		1	+0%					27.865	-0.600	0.000
S4.002	S12	15 Summer		1	+0%					27.790	-0.600	0.000
S3.003	S10	15 Summer		1	+0%					27.740	-0.600	0.000
S2.006	S7	60 Winter		1	+0%	100/30 Winter				27.474	-0.456	0.000
S2.007	S8	15 Winter		1	+0%	100/30 Winter				27.456	-0.454	0.000
S2.008	S9	15 Winter		1	+0%	100/15 Summer				27.436	-0.424	0.000
S2.009	S10	15 Winter		1	+0%	100/15 Summer				27.416	-0.404	0.000
S2.010	S11	15 Winter		1	+0%	100/15 Summer				27.396	-0.384	0.000
S2.011	S12	120 Winter		1	+0%	100/15 Winter				27.394	-0.371	0.000
S5.000	S13	15 Summer		1	+0%	100/120 Winter				27.480	-0.600	0.000
S5.001	S14	15 Summer		1	+0%	100/120 Winter				27.470	-0.600	0.000
S5.002	S15	15 Summer		1	+0%	100/60 Winter				27.440	-0.600	0.000
S5.003	S16	15 Summer		1	+0%	100/60 Winter				27.430	-0.600	0.000
S2.012	S13	120 Winter		1	+0%	30/120 Winter				27.385	-0.305	0.000
S2.013	S14	120 Winter		1	+0%	30/120 Winter				27.381	-0.279	0.000
S2.014	S15	120 Winter		1	+0%	30/60 Winter				27.372	-0.243	0.000
S6.000	S20	30 Winter		1	+0%	100/30 Summer				27.892	-0.508	0.000
S6.001	S21	30 Winter		1	+0%	100/60 Summer				27.872	-0.488	0.000
S6.002	S22	30 Winter		1	+0%	100/30 Winter				27.842	-0.463	0.000
S6.003	S23	30 Winter		1	+0%	100/30 Winter				27.794	-0.441	0.000
S6.004	S24	15 Winter		1	+0%					27.775	-0.425	0.000
S6.005	S25	15 Winter		1	+0%	100/60 Winter				27.739	-0.401	0.000
S6.006	S26	15 Winter		1	+0%	100/60 Winter				27.701	-0.394	0.000
S6.007	S27	60 Winter		1	+0%	100/60 Winter				27.671	-0.409	0.000

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
				Time (mins)	Pipe			
S2.000	S1	0.04				13.5	OK	
S2.001	S2	0.07				13.6	OK	
S2.002	S3	0.08				13.9	OK	
S2.003	S4	0.16				42.6	OK	
S2.004	S5	0.07		42		15.7	OK	
S2.005	S6	0.03				15.7	OK	
S3.000	S7	0.00				0.0	OK	
S3.001	S8	0.00				0.0	OK	
S3.002	S9	0.00				0.0	OK	
S4.000	S10	0.00				0.0	OK	
S4.001	S11	0.00				0.0	OK	
S4.002	S12	0.00				0.0	OK	
S3.003	S10	0.00				0.0	OK	
S2.006	S7	0.12				17.3	OK	
S2.007	S8	0.07				16.1	OK	
S2.008	S9	0.11				22.8	OK	
S2.009	S10	0.13				27.7	OK	
S2.010	S11	0.20				42.7	OK	
S2.011	S12	0.12				32.6	OK	
S5.000	S13	0.00				0.0	OK	
S5.001	S14	0.00				0.0	OK	
S5.002	S15	0.00				0.0	OK	
S5.003	S16	0.00				0.0	OK	
S2.012	S13	0.22		33		38.5	OK	
S2.013	S14	0.17				37.9	OK	
S2.014	S15	0.08				36.1	OK	
S6.000	S20	0.04				11.3	OK	
S6.001	S21	0.05				11.3	OK	
S6.002	S22	0.08				21.0	OK	
S6.003	S23	0.11				21.5	OK	
S6.004	S24	0.11				28.6	OK	
S6.005	S25	0.18				41.9	OK	
S6.006	S26	0.26				54.1	OK	
S6.007	S27	0.16		47		41.5	OK	

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

											Water	Surcharged	Flooded
											Level	Depth	Volume
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.			(m)	(m)	(m³)
S6.008	S28	60 Winter	1	+0%	100/30 Summer						27.607	-0.383	0.000
S6.009	S29	60 Winter	1	+0%	100/30 Winter						27.602	-0.378	0.000
S6.010	S30	60 Winter	1	+0%	100/60 Summer						27.577	-0.383	0.000
S6.011	S31	60 Winter	1	+0%	100/30 Winter						27.514	-0.371	0.000
S6.012	S32	60 Winter	1	+0%	100/30 Winter						27.462	-0.383	0.000
S6.013	S33	120 Winter	1	+0%	100/30 Winter						27.392	-0.413	0.000
S6.014	S34	120 Winter	1	+0%	100/30 Summer						27.376	-0.399	0.000
S2.015	S16	120 Winter	1	+0%	30/15 Summer						27.364	-0.031	0.000
S7.000	S51	30 Winter	1	+0%							28.086	-0.514	0.000
S7.001	S52	30 Winter	1	+0%							27.989	-0.516	0.000
S7.002	S53	30 Winter	1	+0%							27.877	-0.513	0.000
S7.003	S54	30 Winter	1	+0%							27.789	-0.521	0.000
S8.000	S50	30 Winter	1	+0%							28.085	-0.515	0.000
S8.001	S51	30 Winter	1	+0%							27.989	-0.516	0.000
S8.002	S52	30 Winter	1	+0%							27.885	-0.530	0.000
S7.004	S55	15 Winter	1	+0%	100/60 Winter						27.714	-0.466	0.000
S7.005	S56	15 Winter	1	+0%	100/60 Winter						27.652	-0.428	0.000
S7.006	S57	180 Winter	1	+0%	100/60 Summer						27.616	-0.409	0.000
S7.007	S54	180 Winter	1	+0%							27.431	-0.539	0.000
S7.008	S59	240 Winter	1	+0%							27.372	-0.538	0.000
S7.009	S60	240 Winter	1	+0%							27.255	-0.535	0.000
S7.010	S44	240 Winter	1	+0%							27.202	-0.538	0.000
S7.011	S45	240 Winter	1	+0%							27.062	-0.538	0.000
S7.012	S46	240 Winter	1	+0%							26.930	-0.540	0.000
S2.016	S43	180 Winter	1	+0%							26.813	-0.507	0.000

				Half Drain		Pipe			
		US/MH Flow / Overflow		Time		Flow		Level	
PN	Name	Cap.	(l/s)	(mins)		(l/s)	Status	Exceeded	
S6.008	S28	0.19				42.1	OK		
S6.009	S29	0.28				46.9	OK		
S6.010	S30	0.20				52.6	OK		
S6.011	S31	0.28				58.8	OK		
S6.012	S32	0.28				58.7	OK		
S6.013	S33	0.21		77		45.1	OK		
S6.014	S34	0.07		42		42.8	OK		
S2.015	S16	0.09		72		43.4	OK		
S7.000	S51	0.05				16.0	OK		
S7.001	S52	0.05				16.0	OK		
S7.002	S53	0.05				15.9	OK		
S7.003	S54	0.04		18		13.9	OK		
S8.000	S50	0.05				16.0	OK		
S8.001	S51	0.05				16.0	OK		
S8.002	S52	0.03				16.0	OK		
S7.004	S55	0.10				35.7	OK		
S7.005	S56	0.18				57.1	OK		
S7.006	S57	0.02		143		7.7	OK		
S7.007	S54	0.02				7.7	OK		
S7.008	S59	0.02				8.2	OK		
S7.009	S60	0.03				8.2	OK		
S7.010	S44	0.02				8.2	OK		
S7.011	S45	0.02				8.2	OK		
S7.012	S46	0.02				8.2	OK		
S2.016	S43	0.14				51.4	OK		

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.700 Cv (Summer) 0.750
Region England and Wales Ratio R 0.438 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

											Water	Surcharged	Flooded
US/MH		Return Climate		First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume			
PN	Name	Storm	Period Change										
S2.000	S1	15 Winter	30	+0%				28.023	-0.417	0.000			
S2.001	S2	15 Winter	30	+0%				28.011	-0.364	0.000			
S2.002	S3	15 Winter	30	+0%				28.003	-0.337	0.000			
S2.003	S4	15 Winter	30	+0%				27.998	-0.312	0.000			
S2.004	S5	120 Winter	30	+0%				27.862	-0.333	0.000			
S2.005	S6	120 Winter	30	+0%				27.862	-0.318	0.000			
S3.000	S7	15 Summer	30	+0%				27.860	-0.600	0.000			
S3.001	S8	120 Winter	30	+0%				27.855	-0.590	0.000			
S3.002	S9	120 Winter	30	+0%				27.855	-0.570	0.000			
S4.000	S10	15 Summer	30	+0%				27.880	-0.600	0.000			
S4.001	S11	15 Summer	30	+0%				27.865	-0.600	0.000			
S4.002	S12	180 Winter	30	+0%				27.809	-0.581	0.000			
S3.003	S10	120 Winter	30	+0%				27.855	-0.485	0.000			
S2.006	S7	120 Winter	30	+0%	100/30 Winter			27.860	-0.070	0.000			
S2.007	S8	120 Winter	30	+0%	100/30 Winter			27.857	-0.053	0.000			
S2.008	S9	120 Winter	30	+0%	100/15 Summer			27.838	-0.022	0.000			
S2.009	S10	120 Winter	30	+0%	100/15 Summer			27.814	-0.006	0.000			
S2.010	S11	120 Winter	30	+0%	100/15 Summer			27.780	0.000	0.000			
S2.011	S12	120 Winter	30	+0%	100/15 Winter			27.765	0.000	0.000			
S5.000	S13	240 Winter	30	+0%	100/120 Winter			27.690	-0.390	0.000			
S5.001	S14	240 Winter	30	+0%	100/120 Winter			27.690	-0.380	0.000			
S5.002	S15	240 Winter	30	+0%	100/60 Winter			27.690	-0.350	0.000			
S5.003	S16	180 Winter	30	+0%	100/60 Winter			27.690	-0.340	0.000			
S2.012	S13	120 Winter	30	+0%	30/120 Winter			27.690	0.000	0.000			
S2.013	S14	180 Winter	30	+0%	30/120 Winter			27.668	0.008	0.000			
S2.014	S15	120 Winter	30	+0%	30/60 Winter			27.659	0.044	0.000			
S6.000	S20	15 Winter	30	+0%	100/30 Summer			27.961	-0.439	0.000			
S6.001	S21	15 Winter	30	+0%	100/60 Summer			27.948	-0.412	0.000			
S6.002	S22	15 Winter	30	+0%	100/30 Winter			27.932	-0.373	0.000			
S6.003	S23	15 Winter	30	+0%	100/30 Winter			27.908	-0.327	0.000			
S6.004	S24	15 Winter	30	+0%				27.900	-0.300	0.000			
S6.005	S25	15 Winter	30	+0%	100/60 Winter			27.874	-0.266	0.000			
S6.006	S26	15 Winter	30	+0%	100/60 Winter			27.841	-0.254	0.000			
S6.007	S27	120 Winter	30	+0%	100/60 Winter			27.819	-0.261	0.000			

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

		Half Drain		Pipe			
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
S2.000	S1	0.11			32.3	OK	
S2.001	S2	0.18			33.4	OK	
S2.002	S3	0.21			35.7	OK	
S2.003	S4	0.44			119.9	OK	
S2.004	S5	0.18		77	38.1	OK	
S2.005	S6	0.07			37.0	OK	
S3.000	S7	0.00			0.0	OK	
S3.001	S8	0.00			0.0	OK	
S3.002	S9	0.00			0.1	OK	
S4.000	S10	0.00			0.0	OK	
S4.001	S11	0.00			0.0	OK	
S4.002	S12	0.00		44	1.0	OK	
S3.003	S10	0.00			1.0	OK	
S2.006	S7	0.24			35.5	OK	
S2.007	S8	0.17			40.9	OK	
S2.008	S9	0.21			44.6	OK	
S2.009	S10	0.23			47.3	OK	
S2.010	S11	0.29			60.3	OK	
S2.011	S12	0.29			75.4	OK	
S5.000	S13	0.00			0.1	OK	
S5.001	S14	0.00			0.2	OK	
S5.002	S15	0.00			0.6	OK	
S5.003	S16	0.00			0.8	OK	
S2.012	S13	0.30		176	52.2	SURCHARGED	
S2.013	S14	0.18			40.9	SURCHARGED	
S2.014	S15	0.10			45.5	SURCHARGED	
S6.000	S20	0.10			27.1	OK	
S6.001	S21	0.11			27.3	OK	
S6.002	S22	0.14			37.6	OK	
S6.003	S23	0.21			40.5	OK	
S6.004	S24	0.24			59.3	OK	
S6.005	S25	0.41			94.8	OK	
S6.006	S26	0.63			132.8	OK	
S6.007	S27	0.26		77	68.4	OK	

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

											Water	Surcharged	Flooded
		US/MH	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume		
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)		
S6.008	S28	120 Winter	30	+0%	100/30 Summer				27.794	-0.196	0.000		
S6.009	S29	120 Winter	30	+0%	100/30 Winter				27.791	-0.189	0.000		
S6.010	S30	120 Winter	30	+0%	100/60 Summer				27.785	-0.175	0.000		
S6.011	S31	120 Winter	30	+0%	100/30 Winter				27.743	-0.142	0.000		
S6.012	S32	120 Winter	30	+0%	100/30 Winter				27.718	-0.127	0.000		
S6.013	S33	120 Winter	30	+0%	100/30 Winter				27.690	-0.115	0.000		
S6.014	S34	120 Winter	30	+0%	100/30 Summer				27.673	-0.102	0.000		
S2.015	S16	120 Winter	30	+0%	30/15 Summer				27.648	0.253	0.000		
S7.000	S51	30 Winter	30	+0%					28.138	-0.462	0.000		
S7.001	S52	30 Winter	30	+0%					28.041	-0.464	0.000		
S7.002	S53	30 Winter	30	+0%					27.930	-0.460	0.000		
S7.003	S54	180 Winter	30	+0%					27.877	-0.433	0.000		
S8.000	S50	30 Winter	30	+0%					28.138	-0.462	0.000		
S8.001	S51	30 Winter	30	+0%					28.041	-0.464	0.000		
S8.002	S52	30 Winter	30	+0%					27.928	-0.487	0.000		
S7.004	S55	180 Winter	30	+0%	100/60 Winter				27.877	-0.303	0.000		
S7.005	S56	180 Winter	30	+0%	100/60 Winter				27.876	-0.204	0.000		
S7.006	S57	180 Winter	30	+0%	100/60 Summer				27.874	-0.151	0.000		
S7.007	S54	360 Winter	30	+0%					27.435	-0.535	0.000		
S7.008	S59	15 Winter	30	+0%					27.414	-0.496	0.000		
S7.009	S60	15 Winter	30	+0%					27.301	-0.489	0.000		
S7.010	S44	15 Winter	30	+0%					27.241	-0.499	0.000		
S7.011	S45	15 Winter	30	+0%					27.101	-0.499	0.000		
S7.012	S46	15 Winter	30	+0%					26.965	-0.505	0.000		
S2.016	S43	60 Winter	30	+0%					26.828	-0.492	0.000		

				Half Drain	Pipe			
PN	US/MH	Flow /	Overflow	Time	Flow			
	Name	Cap.	(l/s)	(mins)	(l/s)	Status	Level	
							Exceeded	
S6.008	S28	0.30			67.5	OK		
S6.009	S29	0.48			80.1	OK		
S6.010	S30	0.36			92.9	OK		
S6.011	S31	0.50			104.4	OK		
S6.012	S32	0.50			103.0	OK		
S6.013	S33	0.30		153	64.2	OK		
S6.014	S34	0.09		120	54.4	OK		
S2.015	S16	0.10		223	44.7	SURCHARGED		
S7.000	S51	0.12			39.0	OK		
S7.001	S52	0.12			38.9	OK		
S7.002	S53	0.12			38.8	OK		
S7.003	S54	0.04		90	14.2	OK		
S8.000	S50	0.12			39.0	OK		
S8.001	S51	0.12			39.0	OK		
S8.002	S52	0.08			39.0	OK		
S7.004	S55	0.13			43.7	OK		
S7.005	S56	0.18			57.2	OK		
S7.006	S57	0.03		219	9.3	OK		
S7.007	S54	0.03			9.3	OK		
S7.008	S59	0.07			23.7	OK		
S7.009	S60	0.08			23.6	OK		
S7.010	S44	0.07			23.3	OK		
S7.011	S45	0.07			23.0	OK		
S7.012	S46	0.06			22.7	OK		
S2.016	S43	0.17			60.7	OK		

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 9 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.700 Cv (Summer) 0.750
Region England and Wales Ratio R 0.438 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

					Water Surcharged Flooded						
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)
S2.000	S1	120 Winter	100	+40%					28.202	-0.238	0.000
S2.001	S2	120 Winter	100	+40%					28.197	-0.178	0.000
S2.002	S3	120 Winter	100	+40%					28.191	-0.149	0.000
S2.003	S4	120 Winter	100	+40%					28.185	-0.125	0.000
S2.004	S5	180 Winter	100	+40%					28.152	-0.043	0.000
S2.005	S6	180 Winter	100	+40%					28.150	-0.030	0.000
S3.000	S7	180 Winter	100	+40%					28.144	-0.316	0.000
S3.001	S8	180 Winter	100	+40%					28.144	-0.301	0.000
S3.002	S9	180 Winter	100	+40%					28.144	-0.281	0.000
S4.000	S10	180 Winter	100	+40%					28.143	-0.337	0.000
S4.001	S11	180 Winter	100	+40%					28.143	-0.322	0.000
S4.002	S12	180 Winter	100	+40%					28.143	-0.247	0.000
S3.003	S10	180 Winter	100	+40%					28.144	-0.196	0.000
S2.006	S7	180 Winter	100	+40%	100/30 Winter				28.144	0.214	0.000
S2.007	S8	180 Winter	100	+40%	100/30 Winter				28.144	0.234	0.000
S2.008	S9	180 Winter	100	+40%	100/15 Summer				28.143	0.283	0.000
S2.009	S10	180 Winter	100	+40%	100/15 Summer				28.142	0.322	0.000
S2.010	S11	180 Winter	100	+40%	100/15 Summer				28.140	0.360	0.000
S2.011	S12	180 Winter	100	+40%	100/15 Winter				28.139	0.374	0.000
S5.000	S13	180 Winter	100	+40%	100/120 Winter				28.136	0.056	0.000
S5.001	S14	180 Winter	100	+40%	100/120 Winter				28.137	0.067	0.000
S5.002	S15	180 Winter	100	+40%	100/60 Winter				28.137	0.097	0.000
S5.003	S16	180 Winter	100	+40%	100/60 Winter				28.137	0.107	0.000
S2.012	S13	180 Winter	100	+40%	30/120 Winter				28.137	0.447	0.000
S2.013	S14	180 Winter	100	+40%	30/120 Winter				28.135	0.475	0.000
S2.014	S15	180 Winter	100	+40%	30/60 Winter				28.132	0.517	0.000
S6.000	S20	60 Summer	100	+40%	100/30 Summer				28.405	0.005	0.000
S6.001	S21	60 Summer	100	+40%	100/60 Summer				28.361	0.001	0.000
S6.002	S22	30 Winter	100	+40%	100/30 Winter				28.306	0.001	0.000
S6.003	S23	30 Winter	100	+40%	100/30 Winter				28.235	0.000	0.000
S6.004	S24	120 Winter	100	+40%					28.200	0.000	0.000
S6.005	S25	180 Winter	100	+40%	100/60 Winter				28.174	0.034	0.000
S6.006	S26	180 Winter	100	+40%	100/60 Winter				28.171	0.076	0.000
S6.007	S27	180 Winter	100	+40%	100/60 Winter				28.169	0.089	0.000

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

		Half Drain		Pipe			
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
S2.000	S1	0.11			32.8	OK	
S2.001	S2	0.17			32.1	OK	
S2.002	S3	0.19			31.3	OK	
S2.003	S4	0.31			83.9	OK	
S2.004	S5	0.18		205	39.0	OK	
S2.005	S6	0.08			38.3	OK	
S3.000	S7	0.00			0.1	OK	
S3.001	S8	0.00			0.2	OK	
S3.002	S9	0.00			0.3	OK	
S4.000	S10	0.00			0.1	OK	
S4.001	S11	0.00			0.2	OK	
S4.002	S12	0.03		128	6.6	OK	
S3.003	S10	0.01			7.4	OK	
S2.006	S7	0.26			37.7	SURCHARGED	
S2.007	S8	0.18			44.3	SURCHARGED	
S2.008	S9	0.24			50.0	SURCHARGED	
S2.009	S10	0.26			54.7	SURCHARGED	
S2.010	S11	0.35			74.2	SURCHARGED	
S2.011	S12	0.35			91.7	SURCHARGED	
S5.000	S13	0.00			0.1	SURCHARGED	
S5.001	S14	0.00			0.3	SURCHARGED	
S5.002	S15	0.00			1.0	SURCHARGED	
S5.003	S16	0.00			1.2	SURCHARGED	
S2.012	S13	0.38		294	66.4	SURCHARGED	
S2.013	S14	0.24			53.5	SURCHARGED	
S2.014	S15	0.11			50.7	SURCHARGED	
S6.000	S20	0.16			42.6	SURCHARGED	
S6.001	S21	0.17			43.3	SURCHARGED	
S6.002	S22	0.23			59.7	SURCHARGED	
S6.003	S23	0.31			59.7	SURCHARGED	
S6.004	S24	0.20			49.9	OK	
S6.005	S25	0.26			59.3	SURCHARGED	
S6.006	S26	0.35			75.0	SURCHARGED	
S6.007	S27	0.30		304	78.8	SURCHARGED	

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

											Water	Surcharged	Flooded
		US/MH	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth			
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)			Volume (m³)
S6.008	S28	180 Winter	100	+40%	100/30 Summer				28.163	0.173			0.000
S6.009	S29	180 Winter	100	+40%	100/30 Winter				28.162	0.182			0.000
S6.010	S30	180 Winter	100	+40%	100/60 Summer				28.158	0.198			0.000
S6.011	S31	180 Winter	100	+40%	100/30 Winter				28.151	0.266			0.000
S6.012	S32	180 Winter	100	+40%	100/30 Winter				28.145	0.300			0.000
S6.013	S33	180 Winter	100	+40%	100/30 Winter				28.139	0.334			0.000
S6.014	S34	180 Winter	100	+40%	100/30 Summer				28.135	0.360			0.000
S2.015	S16	180 Winter	100	+40%	30/15 Summer				28.129	0.734			0.000
S7.000	S51	120 Winter	100	+40%					28.268	-0.332			0.000
S7.001	S52	240 Winter	100	+40%					28.253	-0.252			0.000
S7.002	S53	240 Winter	100	+40%					28.252	-0.138			0.000
S7.003	S54	240 Winter	100	+40%					28.251	-0.059			0.000
S8.000	S50	240 Winter	100	+40%					28.251	-0.349			0.000
S8.001	S51	240 Winter	100	+40%					28.251	-0.254			0.000
S8.002	S52	240 Winter	100	+40%					28.250	-0.165			0.000
S7.004	S55	240 Winter	100	+40%	100/60 Winter				28.250	0.070			0.000
S7.005	S56	240 Winter	100	+40%	100/60 Winter				28.248	0.168			0.000
S7.006	S57	240 Winter	100	+40%	100/60 Summer				28.247	0.222			0.000
S7.007	S54	15 Winter	100	+40%					27.453	-0.517			0.000
S7.008	S59	15 Winter	100	+40%					27.451	-0.459			0.000
S7.009	S60	15 Winter	100	+40%					27.339	-0.451			0.000
S7.010	S44	15 Winter	100	+40%					27.279	-0.461			0.000
S7.011	S45	15 Winter	100	+40%					27.138	-0.462			0.000
S7.012	S46	15 Winter	100	+40%					27.001	-0.469			0.000
S2.016	S43	15 Winter	100	+40%					26.857	-0.463			0.000

				Half Drain	Pipe			
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
S6.008	S28	0.35			78.7	SURCHARGED		
S6.009	S29	0.56			92.0	SURCHARGED		
S6.010	S30	0.41			106.4	SURCHARGED		
S6.011	S31	0.58			122.0	SURCHARGED		
S6.012	S32	0.58			119.2	SURCHARGED		
S6.013	S33	0.26		317	55.1	SURCHARGED		
S6.014	S34	0.08		201	48.2	SURCHARGED		
S2.015	S16	0.10		454	44.8	SURCHARGED		
S7.000	S51	0.12			39.2	OK		
S7.001	S52	0.07			23.0	OK		
S7.002	S53	0.07			21.1	OK		
S7.003	S54	0.04		292	14.8	OK		
S8.000	S50	0.07			23.5	OK		
S8.001	S51	0.07			23.0	OK		
S8.002	S52	0.05			22.1	OK		
S7.004	S55	0.14			49.2	SURCHARGED		
S7.005	S56	0.21			66.9	SURCHARGED		
S7.006	S57	0.03		447	9.3	SURCHARGED		
S7.007	S54	0.03			9.3	OK		
S7.008	S59	0.12			43.0	OK		
S7.009	S60	0.14			42.4	OK		
S7.010	S44	0.12			42.4	OK		
S7.011	S45	0.12			41.5	OK		
S7.012	S46	0.11			40.8	OK		
S2.016	S43	0.22			78.9	OK		