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107 Mere Grange Business Park Leaside St Helens WA9 5GG	SUPREME DEVOPMENTS MANCHESTER BRADSTONE ROAD 7194 P3	
Date 07/11/2024 10:54 File 7194-DRAINAGE MD	Designed by glynr Checked by	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes ADS-STN Manhole Sizes ADS-STD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.355	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	250	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.900
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 Inverts

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.189	4-8	0.057

Total Area Contributing (ha) = 0.246

Total Pipe Volume (m³) = 9.784

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
Sw-1.000	4.813	0.064	74.8	0.024	4.00	0.0	0.600	o	100	Pipe/Conduit	
Sw-2.000	12.831	0.086	150.0	0.015	4.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-2.001	16.891	0.113	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-2.002	25.236	0.168	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
Sw-1.000	64.27	4.09	50.917	0.024	0.0	0.0	0.0	0.89	7.0	4.2
Sw-2.000	63.29	4.26	51.215	0.015	0.0	0.0	0.0	0.82	14.5	2.6
Sw-2.001	61.44	4.61	51.129	0.015	0.0	0.0	0.0	0.82	14.5	2.6
Sw-2.002	58.89	5.12	51.017	0.015	0.0	0.0	0.0	0.82	14.5	2.6

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SUPREME DEVOPMENTS MANCHESTER
BRADSTONE ROAD
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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
Sw-3.000	18.141	0.121	150.0	0.001	4.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-3.001	16.375	0.109	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-3.002	16.275	0.146	111.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-1.001	12.950	0.086	149.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-4.000	22.676	0.151	150.0	0.009	4.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-4.001	12.761	0.085	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-5.000	2.521	0.302	8.4	0.010	4.00	0.0	0.600	o	100	Pipe/Conduit		
Sw-4.002	2.324	0.122	19.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-1.002	27.046	0.161	168.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
Sw-6.000	9.180	0.061	150.0	0.005	4.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-6.001	24.773	0.632	39.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
Sw-7.000	16.221	0.470	34.5	0.016	4.00	0.0	0.600	o	100	Pipe/Conduit		
Sw-8.000	15.100	0.481	31.4	0.011	4.00	0.0	0.600	o	100	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)
Sw-3.000	62.70	4.37	51.225	0.001	0.0	0.0	0.0	0.82	14.5	0.2
Sw-3.001	60.93	4.70	51.104	0.001	0.0	0.0	0.0	0.82	14.5	0.2
Sw-3.002	59.52	4.99	50.995	0.001	0.0	0.0	0.0	0.95	16.8	0.2
Sw-1.001	57.68	5.38	50.115	0.040	0.0	0.0	0.0	0.82	14.5	6.3
Sw-4.000	62.20	4.46	50.852	0.009	0.0	0.0	0.0	0.82	14.5	1.5
Sw-4.001	60.84	4.72	50.235	0.009	0.0	0.0	0.0	0.82	14.5	1.5
Sw-5.000	64.70	4.02	50.705	0.010	0.0	0.0	0.0	2.69	21.1	1.8
Sw-4.002	60.75	4.74	50.150	0.019	0.0	0.0	0.0	2.32	41.0	3.1
Sw-1.002	55.75	5.83	50.028	0.059	0.0	0.0	0.0	1.00	39.9	8.9
Sw-6.000	63.71	4.19	50.670	0.005	0.0	0.0	0.0	0.82	14.5	0.8
Sw-6.001	62.30	4.44	50.609	0.005	0.0	0.0	0.0	1.61	28.5	0.8
Sw-7.000	63.61	4.21	50.663	0.016	0.0	0.0	0.0	1.32	10.3	2.8
Sw-8.000	63.74	4.18	50.673	0.011	0.0	0.0	0.0	1.38	10.8	1.9

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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
Sw-9.000	19.303	0.129	150.0	0.021	4.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-9.001	13.110	0.087	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-9.002	24.635	0.164	150.0	0.010	0.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-9.003	5.704	0.074	77.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-10.000	11.828	0.079	150.0	0.016	4.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-10.001	9.658	0.064	150.0	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
Sw-10.002	21.857	0.055	400.0	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
Sw-11.000	34.845	0.232	150.0	0.028	4.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-11.001	16.957	0.153	110.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
Sw-11.002	27.871	0.148	189.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
Sw-1.003	4.820	0.050	96.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
Sw-1.004	2.634	0.050	52.7	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)
Sw-9.000	62.57	4.39	50.850	0.021	0.0	0.0	0.0	0.82	14.5	3.5
Sw-9.001	61.15	4.66	50.721	0.021	0.0	0.0	0.0	0.82	14.5	3.5
Sw-9.002	58.69	5.16	50.634	0.030	0.0	0.0	0.0	0.82	14.5	4.8
Sw-9.003	58.31	5.25	49.600	0.030	0.0	0.0	0.0	1.14	20.2	4.8
Sw-10.000	63.41	4.24	50.040	0.016	0.0	0.0	0.0	0.82	14.5	2.8
Sw-10.001	62.57	4.39	49.961	0.046	0.0	0.0	0.0	1.07	42.4	7.8
Sw-10.002	59.68	4.95	49.897	0.097	0.0	0.0	0.0	0.65	25.8	15.7
Sw-11.000	60.90	4.71	50.710	0.028	0.0	0.0	0.0	0.82	14.5	4.6
Sw-11.001	59.43	5.01	50.478	0.028	0.0	0.0	0.0	0.95	16.9	4.6
Sw-11.002	57.18	5.50	50.325	0.028	0.0	0.0	0.0	0.95	37.7	4.6
Sw-1.003	55.54	5.88	49.475	0.246	0.0	0.0	0.0	1.60	113.2	37.0
Sw-1.004	55.44	5.91	49.425	0.246	0.0	0.0	0.0	1.81	71.8	37.0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: MH-ATT-TK, DS/PN: Sw-1.003, Volume (m³): 3.8

Unit Reference MD-SHE-0127-7500-1075-7500

Design Head (m)1.075

Design Flow (l/s)7.5

Flush-Flo™Calculated

ObjectiveMinimise upstream storage

ApplicationSurface

Sump AvailableYes

Diameter (mm)127

Invert Level (m)49.475

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)	1.075	7.5	Kick-Flo®	0.699	6.1
Flush-Flo™	0.321	7.5	Mean Flow over Head Range	-	6.5

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.5	1.200	7.9	3.000	12.2	7.000	18.2
0.200	7.2	1.400	8.5	3.500	13.1	7.500	18.8
0.300	7.5	1.600	9.0	4.000	13.9	8.000	19.4
0.400	7.4	1.800	9.6	4.500	14.8	8.500	20.0
0.500	7.3	2.000	10.0	5.000	15.5	9.000	20.6
0.600	6.9	2.200	10.5	5.500	16.2	9.500	21.1
0.800	6.5	2.400	10.9	6.000	16.9		
1.000	7.2	2.600	11.4	6.500	17.6		

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Storage Structures for Storm

Cellular Storage Manhole: MH-ATT-TK, DS/PN: Sw-1.003

Invert Level (m) 49.475 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	108.0	540.0	1.076	0.0	759.6
1.075	108.0	759.6			

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Micro Drainage

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

Simulation Criteria

Volumetric Runoff Coeff 0.750

Foul Sewage per hectare (l/s) 0.000

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

Number of Input Hydrographs 0

Number of Storage Structures 1

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Margin for Flood Risk Warning (mm) 300.0

DVD Status ON

Analysis Timestep

Fine Inertia Status OFF

DTS Status OFF

Profile(s)

Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
Sw-1.000	MH-RWP-5	15 Summer	1	+0%				
Sw-2.000	MH-RWP-6	15 Summer	1	+0%				
Sw-2.001	MH-10	15 Summer	1	+0%				
Sw-2.002	MH-11	15 Summer	1	+0%				
Sw-3.000	MH-RWP-7	15 Summer	1	+0%				
Sw-3.001	MH-12	15 Summer	1	+0%				
Sw-3.002	MH-13	15 Summer	1	+0%				
Sw-1.001	MH-14	15 Summer	1	+0%	30/15 Summer			
Sw-4.000	MH-RWP-8	15 Summer	1	+0%				
Sw-4.001	MH-08	15 Summer	1	+0%	100/60 Summer			
Sw-5.000	MH-RWP-4	15 Summer	1	+0%				
Sw-4.002	MH-JK-1	15 Summer	1	+0%	100/15 Summer			
Sw-1.002	MH-9	15 Summer	1	+0%	100/15 Summer			
Sw-6.000	MH-RG	15 Summer	1	+0%				
Sw-6.001	MH-01	15 Summer	1	+0%				
Sw-7.000	MH-RWP-2	15 Summer	1	+0%				
Sw-8.000	MH-RWP-3	15 Summer	1	+0%				
Sw-9.000	MH-RWP-9	15 Summer	1	+0%				
Sw-9.001	MH-04	15 Summer	1	+0%	100/15 Summer			
Sw-9.002	MH-05	15 Summer	1	+0%	100/15 Summer			
Sw-9.003	MH-19	120 Summer	1	+0%	30/15 Summer			
Sw-10.000	MH-RG-1	15 Summer	1	+0%				
Sw-10.001	MH-15	15 Summer	1	+0%	30/15 Summer			
Sw-10.002	MH-18	15 Summer	1	+0%	30/15 Summer			
Sw-11.000	MH-RWP-1	15 Summer	1	+0%				

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Micro Drainage

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

for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
Sw-1.000	MH-RWP-5	50.972	-0.044	0.000	0.59			4.2	OK*
Sw-2.000	MH-RWP-6	51.258	-0.107	0.000	0.18			2.6	OK*
Sw-2.001	MH-10	51.174	-0.106	0.000	0.19			2.5	OK
Sw-2.002	MH-11	51.061	-0.106	0.000	0.19			2.6	OK
Sw-3.000	MH-RWP-7	51.233	-0.142	0.000	0.01			0.2	OK*
Sw-3.001	MH-12	51.112	-0.142	0.000	0.01			0.2	OK
Sw-3.002	MH-13	51.002	-0.143	0.000	0.01			0.2	OK
Sw-1.001	MH-14	50.192	-0.073	0.000	0.50			6.5	OK
Sw-4.000	MH-RWP-8	50.884	-0.118	0.000	0.11			1.5	OK*
Sw-4.001	MH-08	50.269	-0.116	0.000	0.11			1.5	OK
Sw-5.000	MH-RWP-4	50.727	-0.077	0.000	0.12			1.8	OK*
Sw-4.002	MH-JK-1	50.189	-0.111	0.000	0.15			3.2	OK*
Sw-1.002	MH-9	50.107	-0.146	0.000	0.27			9.9	OK
Sw-6.000	MH-RG	50.693	-0.127	0.000	0.06			0.8	OK*
Sw-6.001	MH-01	50.626	-0.133	0.000	0.03			0.8	OK
Sw-7.000	MH-RWP-2	50.698	-0.065	0.000	0.27			2.8	OK*
Sw-8.000	MH-RWP-3	50.701	-0.072	0.000	0.17			1.9	OK*
Sw-9.000	MH-RWP-9	50.900	-0.100	0.000	0.24			3.5	OK*
Sw-9.001	MH-04	50.774	-0.097	0.000	0.26			3.4	OK
Sw-9.002	MH-05	50.695	-0.089	0.000	0.34			4.7	OK
Sw-9.003	MH-19	49.660	-0.090	0.000	0.13			2.1	OK
Sw-10.000	MH-RG-1	50.084	-0.106	0.000	0.19			2.8	OK*
Sw-10.001	MH-15	50.037	-0.149	0.000	0.19			6.6	OK
Sw-10.002	MH-18	50.018	-0.104	0.000	0.56			13.1	OK
Sw-11.000	MH-RWP-1	50.769	-0.091	0.000	0.32			4.6	OK*

PN	US/MH Name	Level Exceeded
Sw-1.000	MH-RWP-5	
Sw-2.000	MH-RWP-6	
Sw-2.001	MH-10	
Sw-2.002	MH-11	
Sw-3.000	MH-RWP-7	
Sw-3.001	MH-12	
Sw-3.002	MH-13	
Sw-1.001	MH-14	
Sw-4.000	MH-RWP-8	
Sw-4.001	MH-08	
Sw-5.000	MH-RWP-4	
Sw-4.002	MH-JK-1	
Sw-1.002	MH-9	
Sw-6.000	MH-RG	
Sw-6.001	MH-01	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
Sw-11.001	MH-02	15 Summer	1	+0%	100/15 Summer			
Sw-11.002	MH-03	15 Summer	1	+0%				
Sw-1.003	MH-ATT-TK	120 Summer	1	+0%	30/15 Summer			
Sw-1.004	MH-17	120 Summer	1	+0%				

PN	US/MH Name	Water	Surcharged	Flooded	Half Drain		Pipe	Status	
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)		Flow (l/s)
Sw-11.001	MH-02	50.533	-0.094	0.000	0.29			4.6	OK
Sw-11.002	MH-03	50.378	-0.171	0.000	0.13			4.5	OK
Sw-1.003	MH-ATT-TK	49.658	-0.117	0.000	0.10		60	6.2	OK*
Sw-1.004	MH-17	49.492	-0.158	0.000	0.20			6.2	OK

PN	US/MH Name	Level Exceeded
Sw-11.001	MH-02	
Sw-11.002	MH-03	
Sw-1.003	MH-ATT-TK	
Sw-1.004	MH-17	

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Micro Drainage

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

Simulation Criteria

Volumetric Runoff Coeff 0.750

Foul Sewage per hectare (l/s) 0.000

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 1

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Margin for Flood Risk Warning (mm) 300.0

DVD Status ON

Analysis Timestep

Fine Inertia Status OFF

DTS Status OFF

Profile(s)

Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
Sw-1.000	MH-RWP-5	15 Summer	30	+0%				
Sw-2.000	MH-RWP-6	15 Summer	30	+0%				
Sw-2.001	MH-10	15 Summer	30	+0%				
Sw-2.002	MH-11	15 Summer	30	+0%				
Sw-3.000	MH-RWP-7	15 Summer	30	+0%				
Sw-3.001	MH-12	15 Summer	30	+0%				
Sw-3.002	MH-13	15 Summer	30	+0%				
Sw-1.001	MH-14	15 Summer	30	+0%	30/15 Summer			
Sw-4.000	MH-RWP-8	15 Summer	30	+0%				
Sw-4.001	MH-08	15 Summer	30	+0%	100/60 Summer			
Sw-5.000	MH-RWP-4	15 Summer	30	+0%				
Sw-4.002	MH-JK-1	15 Summer	30	+0%	100/15 Summer			
Sw-1.002	MH-9	15 Summer	30	+0%	100/15 Summer			
Sw-6.000	MH-RG	15 Summer	30	+0%				
Sw-6.001	MH-01	15 Summer	30	+0%				
Sw-7.000	MH-RWP-2	15 Summer	30	+0%				
Sw-8.000	MH-RWP-3	15 Summer	30	+0%				
Sw-9.000	MH-RWP-9	15 Summer	30	+0%				
Sw-9.001	MH-04	15 Summer	30	+0%	100/15 Summer			
Sw-9.002	MH-05	15 Summer	30	+0%	100/15 Summer			
Sw-9.003	MH-19	120 Summer	30	+0%	30/15 Summer			
Sw-10.000	MH-RG-1	15 Summer	30	+0%				
Sw-10.001	MH-15	15 Summer	30	+0%	30/15 Summer			
Sw-10.002	MH-18	15 Summer	30	+0%	30/15 Summer			
Sw-11.000	MH-RWP-1	15 Summer	30	+0%				

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107 Mere Grange Business Park Leaside St Helens WA9 5GG				SUPREME DEVOPMENTS MANCHESTER BRADSTONE ROAD 7194 P3					
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File 7194-DRAINGE MD				Checked by					
Innovyze				Network 2020.1					
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	
Sw-1.000	MH-RWP-5	51.017	0.000	0.000	1.42		9.9	SURCHARGED*	
Sw-2.000	MH-RWP-6	51.285	-0.080	0.000	0.44		6.4	OK*	
Sw-2.001	MH-10	51.202	-0.077	0.000	0.47		6.3	OK	
Sw-2.002	MH-11	51.088	-0.079	0.000	0.46		6.3	OK	
Sw-3.000	MH-RWP-7	51.242	-0.133	0.000	0.03		0.4	OK*	
Sw-3.001	MH-12	51.121	-0.133	0.000	0.03		0.4	OK	
Sw-3.002	MH-13	51.011	-0.134	0.000	0.02		0.4	OK	
Sw-1.001	MH-14	50.310	0.045	0.000	1.24		16.4	SURCHARGED	
Sw-4.000	MH-RWP-8	50.904	-0.098	0.000	0.26		3.7	OK*	
Sw-4.001	MH-08	50.289	-0.096	0.000	0.28		3.7	OK	
Sw-5.000	MH-RWP-4	50.741	-0.064	0.000	0.28		4.3	OK*	
Sw-4.002	MH-JK-1	50.213	-0.087	0.000	0.36		7.9	OK*	
Sw-1.002	MH-9	50.161	-0.092	0.000	0.65		24.3	OK	
Sw-6.000	MH-RG	50.707	-0.113	0.000	0.14		2.0	OK*	
Sw-6.001	MH-01	50.636	-0.123	0.000	0.07		2.0	OK	
Sw-7.000	MH-RWP-2	50.722	-0.041	0.000	0.65		6.7	OK*	
Sw-8.000	MH-RWP-3	50.718	-0.055	0.000	0.42		4.6	OK*	
Sw-9.000	MH-RWP-9	50.934	-0.066	0.000	0.60		8.6	OK*	
Sw-9.001	MH-04	50.810	-0.061	0.000	0.64		8.5	OK	
Sw-9.002	MH-05	50.747	-0.037	0.000	0.90		12.4	OK	
Sw-9.003	MH-19	49.977	0.227	0.000	0.30		5.0	SURCHARGED	
Sw-10.000	MH-RG-1	50.190	0.000	0.000	0.45		6.6	SURCHARGED*	
Sw-10.001	MH-15	50.264	0.078	0.000	0.51		18.0	SURCHARGED	
Sw-10.002	MH-18	50.212	0.090	0.000	1.63		38.4	SURCHARGED	
Sw-11.000	MH-RWP-1	50.813	-0.047	0.000	0.78		11.2	OK*	

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

PN	US/MH Name	Level Exceeded
Sw-7.000	MH-RWP-2	
Sw-8.000	MH-RWP-3	
Sw-9.000	MH-RWP-9	
Sw-9.001	MH-04	
Sw-9.002	MH-05	
Sw-9.003	MH-19	
Sw-10.000	MH-RG-1	
Sw-10.001	MH-15	
Sw-10.002	MH-18	
Sw-11.000	MH-RWP-1	

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Micro Drainage

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

Simulation Criteria

Volumetric Runoff Coeff 0.750Foul Sewage per hectare (l/s) 0.000

Areal Reduction Factor 1.000Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0Inlet Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0Number of Storage Structures 1

Number of Online Controls 1Number of Time/Area Diagrams 0

Number of Offline Controls 0Number of Real Time Controls 0

Margin for Flood Risk Warning (mm) 300.0DVD Status ON

Analysis TimestepFine Inertia Status OFF

DTS StatusOFF

Profile(s)Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years)1, 30, 100

Climate Change (%)0, 0, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
Sw-1.000	MH-RWP-5	15 Summer	100	+40%				
Sw-2.000	MH-RWP-6	15 Summer	100	+40%				
Sw-2.001	MH-10	15 Summer	100	+40%				
Sw-2.002	MH-11	15 Summer	100	+40%				
Sw-3.000	MH-RWP-7	15 Summer	100	+40%				
Sw-3.001	MH-12	15 Summer	100	+40%				
Sw-3.002	MH-13	15 Summer	100	+40%				
Sw-1.001	MH-14	15 Summer	100	+40%	30/15 Summer			
Sw-4.000	MH-RWP-8	15 Summer	100	+40%				
Sw-4.001	MH-08	120 Winter	100	+40%	100/60 Summer			
Sw-5.000	MH-RWP-4	15 Summer	100	+40%				
Sw-4.002	MH-JK-1	120 Summer	100	+40%	100/15 Summer			
Sw-1.002	MH-9	120 Winter	100	+40%	100/15 Summer			
Sw-6.000	MH-RG	15 Summer	100	+40%				
Sw-6.001	MH-01	15 Summer	100	+40%				
Sw-7.000	MH-RWP-2	15 Summer	100	+40%				
Sw-8.000	MH-RWP-3	15 Summer	100	+40%				
Sw-9.000	MH-RWP-9	15 Summer	100	+40%				
Sw-9.001	MH-04	15 Summer	100	+40%	100/15 Summer			
Sw-9.002	MH-05	15 Summer	100	+40%	100/15 Summer			
Sw-9.003	MH-19	120 Winter	100	+40%	30/15 Summer			
Sw-10.000	MH-RG-1	15 Summer	100	+40%				

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
Sw-1.000	MH-RWP-5	51.017	0.000	0.000	2.45			17.1	SURCHARGED*
Sw-2.000	MH-RWP-6	51.317	-0.048	0.000	0.79			11.5	OK*
Sw-2.001	MH-10	51.236	-0.043	0.000	0.84			11.4	OK
Sw-2.002	MH-11	51.122	-0.045	0.000	0.83			11.4	OK
Sw-3.000	MH-RWP-7	51.247	-0.128	0.000	0.05			0.7	OK*
Sw-3.001	MH-12	51.126	-0.128	0.000	0.05			0.7	OK
Sw-3.002	MH-13	51.015	-0.130	0.000	0.05			0.7	OK
Sw-1.001	MH-14	50.697	0.432	0.000	2.22			29.3	SURCHARGED
Sw-4.000	MH-RWP-8	50.924	-0.078	0.000	0.47			6.7	OK*
Sw-4.001	MH-08	50.515	0.130	0.000	0.15			1.9	SURCHARGED
Sw-5.000	MH-RWP-4	50.755	-0.049	0.000	0.51			7.8	OK*
Sw-4.002	MH-JK-1	50.503	0.203	0.000	0.27			5.9	SURCHARGED*
Sw-1.002	MH-9	50.513	0.260	0.000	0.34			12.7	SURCHARGED
Sw-6.000	MH-RG	50.721	-0.099	0.000	0.25			3.6	OK*
Sw-6.001	MH-01	50.645	-0.113	0.000	0.13			3.6	OK
Sw-7.000	MH-RWP-2	50.763	0.000	0.000	1.08			11.2	SURCHARGED*
Sw-8.000	MH-RWP-3	50.739	-0.034	0.000	0.76			8.3	OK*
Sw-9.000	MH-RWP-9	51.000	0.000	0.000	0.92			13.3	SURCHARGED*
Sw-9.001	MH-04	51.018	0.147	0.000	1.01			13.3	SURCHARGED
Sw-9.002	MH-05	50.935	0.151	0.000	1.38			18.9	SURCHARGED
Sw-9.003	MH-19	50.511	0.761	0.000	0.39			6.5	SURCHARGED
Sw-10.000	MH-RG-1	50.190	0.000	0.000	0.82			11.9	SURCHARGED*
	US/MH Name	Level Exceeded							
Sw-1.000	MH-RWP-5								
Sw-2.000	MH-RWP-6								
Sw-2.001	MH-10								
Sw-2.002	MH-11								
Sw-3.000	MH-RWP-7								
Sw-3.001	MH-12								
Sw-3.002	MH-13								
Sw-1.001	MH-14								
Sw-4.000	MH-RWP-8								
Sw-4.001	MH-08								
Sw-5.000	MH-RWP-4								
Sw-4.002	MH-JK-1								
Sw-1.002	MH-9								
Sw-6.000	MH-RG								
Sw-6.001	MH-01								
Sw-7.000	MH-RWP-2								
Sw-8.000	MH-RWP-3								
Sw-9.000	MH-RWP-9								

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