

DRAINAGE CALCULATIONS NOTE

Site: Highfields, West Hill, East Grinstead, RH19 4DL

Reference: CS260406

Introduction

Reserved Matters planning permission has been granted on this scheme, with drainage Condition 6 requiring the submission on the detailed design / construction stage drainage scheme, to ensure the principals approved at planning stage are carried forward to construction.

Condition 21 also requires the As Built information to be submitted post works to demonstrate compatibility with the design drawings.

The principals approved at planning include:

- Rainfall criteria 100 yr + 45% climate change allowance
- Discharge rate to the existing public sewer at 2.9 l/s
- On site attenuation of the main development area
- The access road lies several meters below the main development level, and as such the entrance road is drained separately, attenuated and pumped to the main site.
- The entrance road drainage include emergency storage to safeguard pump failure.

Drainage Calculations

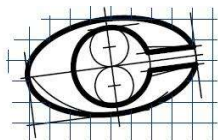
The original drainage strategy by NJP (drawing reference 11089-503P-rev C) sets the principals of the site, though the design does not include all details and drainage simulation of the detailed design information, as such efficiencies / improvement are seen in the detailed design stage, when comparing the planning strategy, which are seen in a reduction of total attenuation volume required. It should be noted that the detailed design still maintains the requirements of the approved planning scheme.

The drainage design includes 2 separate networks, with the access road pumping into the main site, due to limitations of the software this has been modelled separately and an catchment area included in the main site for the access road.

The appendices contain both sets of calculations.

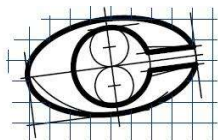
Surface Water Pumping Storage

The drainage model has been simulated with both operational pumps, to confirm the performance of the system, and in a no pump scenario across a range of storm events, up to 24 hours, to confirm the volume of water generated within a 24 hour period, this is then used as the storage volume required.



The following appendices contain three sets of drainage simulations:

1. The first relates to the access road, with an operational pump. This demonstrates the system performs as intended.
2. The second appendix contains the same access road drainage model, with a no pump / no outfall scenario, which confirms the volume of rainfall generated by a 24 hour period is 50m³.
3. The third drainage simulation is the main site network, inclusive of restricted discharge rate, on site attenuation, and a catchment area allowance for the access road.
 - a. Limitations of the software do not allow the access road pump to discharge into the main site, and needs to be separated.



Appendix A

Access Road Calculations

with pumping

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
Rd S34	0.012	450	Unknown	115.333	114.513	0.670	538958.875	137786.536
Rd S35	0.012	450	Unknown	112.300	111.500	0.650	538946.538	137803.291
Rd S36	0.008	450	Unknown	109.196	108.500	0.546	538946.531	137824.119
Rd S37	0.000	450	Unknown	108.210	107.500	0.560	538941.683	137832.719
Rd S38 Pump	0.010	1200	Type B	108.317	106.500	1.667	538943.808	137833.807
Rd S39 Pump Outfall	0.000	1200	Type B	108.198	106.400	1.648	538939.809	137841.056

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	Rd S34	114.513	Rd S35	111.500	Circ	150	20.807	7	0.600	0.670	0.650
1.001	Rd S35	111.500	Rd S36	108.500	Circ	150	20.828	7	0.600	0.650	0.546
1.002	Rd S36	108.500	Rd S37	107.500	Circ	150	9.872	10	0.600	0.546	0.560
1.003	Rd S37	107.500	Rd S38 Pump	106.500	Circ	150	2.387	2	0.600	0.560	1.667

Outfall Details

Outfall Manhole Rd S39 Pump Outfall : Free Discharge

Flow Control Details

Controls within Manhole Rd S38 Pump

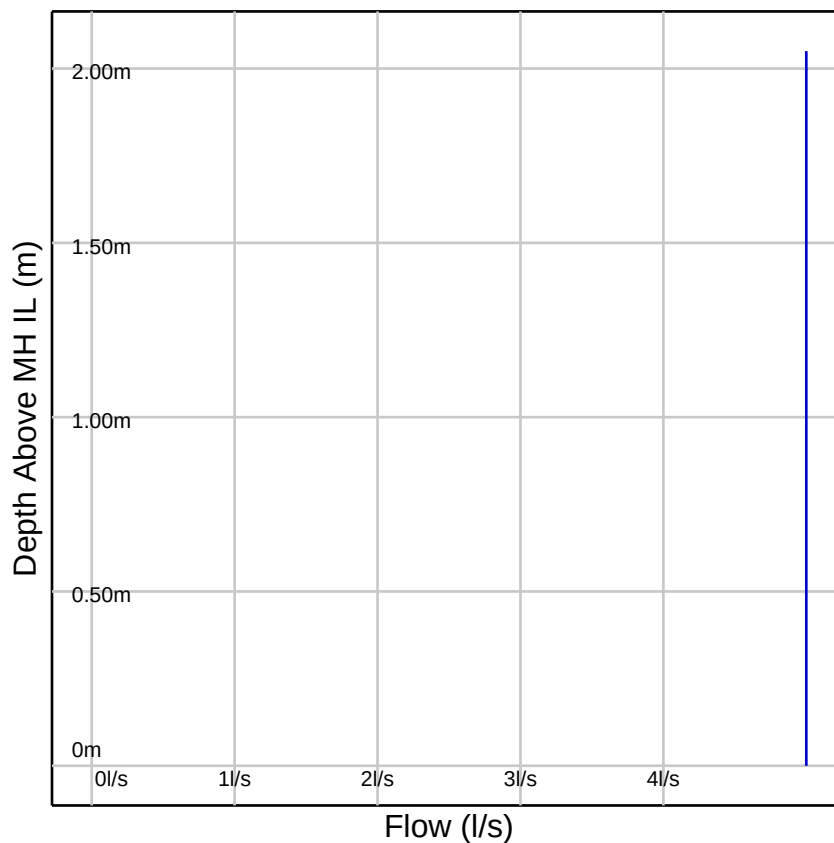
Pump Control

US Manhole	US IL (m)	DS Manhole	DS IL (m)	Startup Depth (m)	Shutoff Depth (m)	Restricted Flow
Rd S38 Pump	106.500	Rd S39 Pump Outfall	106.400	0.100	0.000	Yes*

*Pump Control

Depth Above Manhole Invert (m)	Flow (l/s)
0.000	5.000
2.000	5.000

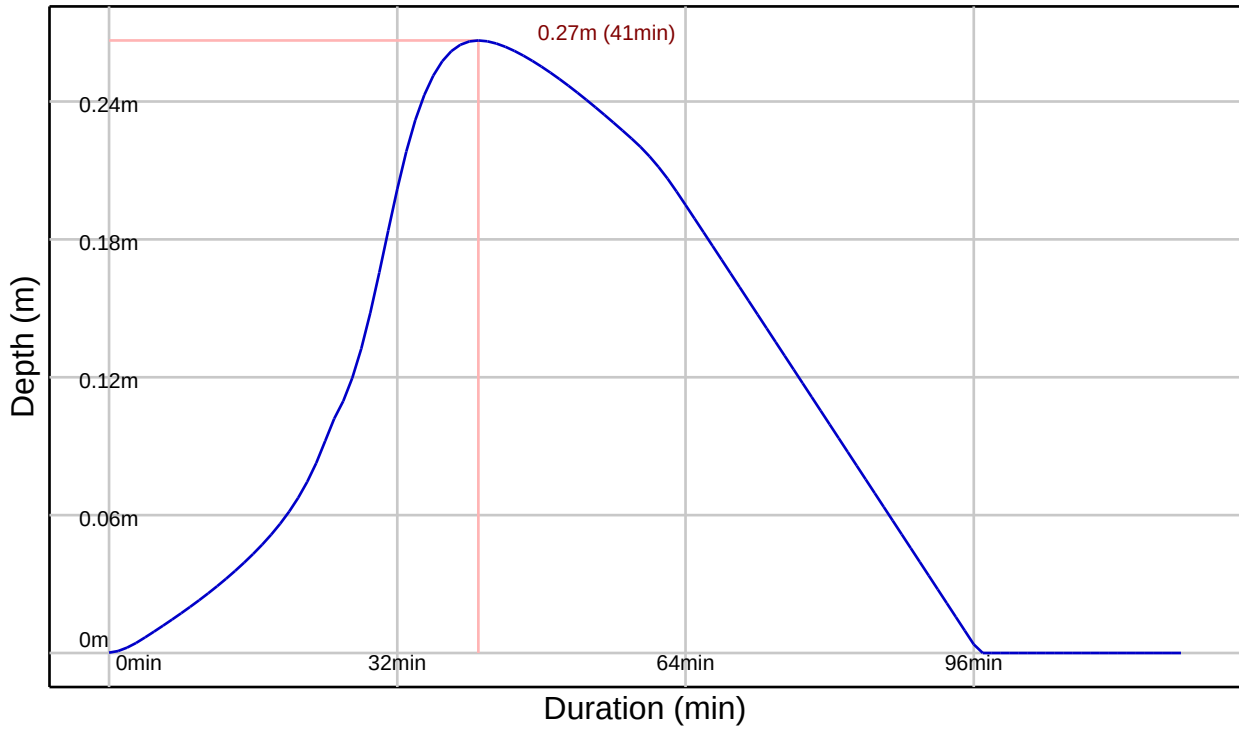
*Pump Control Curve at Rd S38 Pump



Tank Structure at Manhole Rd S38 Pump

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
106.500	1.000	100.00	50.018	50.018	50.018	0.00000000	0.00000000	2.00

Tank 2 at Rd S38 Pump (100Yr+45% 60Min Summer)



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_350039_404939_v5_0_1 - 2.471.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
100Yr+45% 15Min Winter	121.068	0.00	0.00	100Yr+45% 360Min Summer	13.086	0.00	0.00
100Yr+45% 15Min Summer	121.068	0.00	0.00	100Yr+45% 360Min Winter	13.086	0.00	0.00
100Yr+45% 30Min Winter	80.816	0.00	0.00	100Yr+45% 480Min Summer	10.572	0.00	0.00
100Yr+45% 30Min Summer	80.816	0.00	0.00	100Yr+45% 480Min Winter	10.572	0.00	0.00
100Yr+45% 60Min Winter	51.421	0.00	0.00	100Yr+45% 600Min Summer	8.991	0.00	0.00
100Yr+45% 60Min Summer	51.421	0.00	0.00	100Yr+45% 600Min Winter	8.991	0.00	0.00
100Yr+45% 120Min Winter	30.113	0.00	0.00	100Yr+45% 720Min Summer	7.884	0.00	0.00
100Yr+45% 120Min Summer	30.113	0.00	0.00	100Yr+45% 720Min Winter	7.884	0.00	0.00
100Yr+45% 180Min Summer	21.941	0.00	0.00	100Yr+45% 960Min Summer	6.408	0.00	0.00
100Yr+45% 180Min Winter	21.941	0.00	0.00	100Yr+45% 960Min Winter	6.408	0.00	0.00
100Yr+45% 240Min Summer	17.741	0.00	0.00	100Yr+45% 1440Min Winter	4.783	0.00	0.00
100Yr+45% 240Min Winter	17.741	0.00	0.00	100Yr+45% 1440Min Summer	4.783	0.00	0.00

Simulation Results

Return Period (yrs) + Climate Change (%):

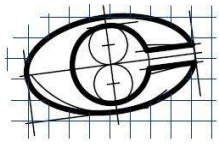
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Rd S34	15 min Summer	8	114.549	0.036	8.598		OK
Rd S35	15 min Summer	8	111.551	0.051	17.176		OK
Rd S36	15 min Summer	8	108.573	0.073	22.849		OK
Rd S37	360 min Summer	177	107.582	0.082	4.342		OK
Rd S38 Pump	60 min Summer	41	106.767	0.267	4.989		Surcharged
Rd S39 Pump Outfall	15 min Winter	0	106.400	0.000	0.000		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	Rd S34	Rd S35	0.043	2.028	8.579	0.126	OK
1.001	15 min Summer	8	Rd S35	Rd S36	0.062	2.494	17.117	0.252	OK
1.002	15 min Summer	8	Rd S36	Rd S37	0.058	3.634	22.764	0.399	OK
1.003	30 min Summer	16	Rd S37	Rd S38 Pump	0.095	3.589	20.417	0.176	OK



Appendix B

Access Road Calculations

with NO pumping

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
Rd S34	0.012	450	Unknown	115.333	114.513	0.670	538958.875	137786.536
Rd S35	0.012	450	Unknown	112.300	111.500	0.650	538946.538	137803.291
Rd S36	0.008	450	Unknown	109.196	108.500	0.546	538946.531	137824.119
Rd S37	0.000	450	Unknown	108.210	107.500	0.560	538941.683	137832.719
Rd S38 Pump	0.010	1200	Type B	108.317	106.500	1.667	538943.808	137833.807
Rd S39 Pump Outfall	0.000	1200	Type B	108.198	106.400	1.648	538939.809	137841.056

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	Rd S34	114.513	Rd S35	111.500	Circ	150	20.807	7	0.600	0.670	0.650
1.001	Rd S35	111.500	Rd S36	108.500	Circ	150	20.828	7	0.600	0.650	0.546
1.002	Rd S36	108.500	Rd S37	107.500	Circ	150	9.872	10	0.600	0.546	0.560
1.003	Rd S37	107.500	Rd S38 Pump	106.500	Circ	150	2.387	2	0.600	0.560	1.667

Outfall Details

Outfall Manhole Rd S39 Pump Outfall : Free Discharge

Flow Control Details

Controls within Manhole Rd S38 Pump

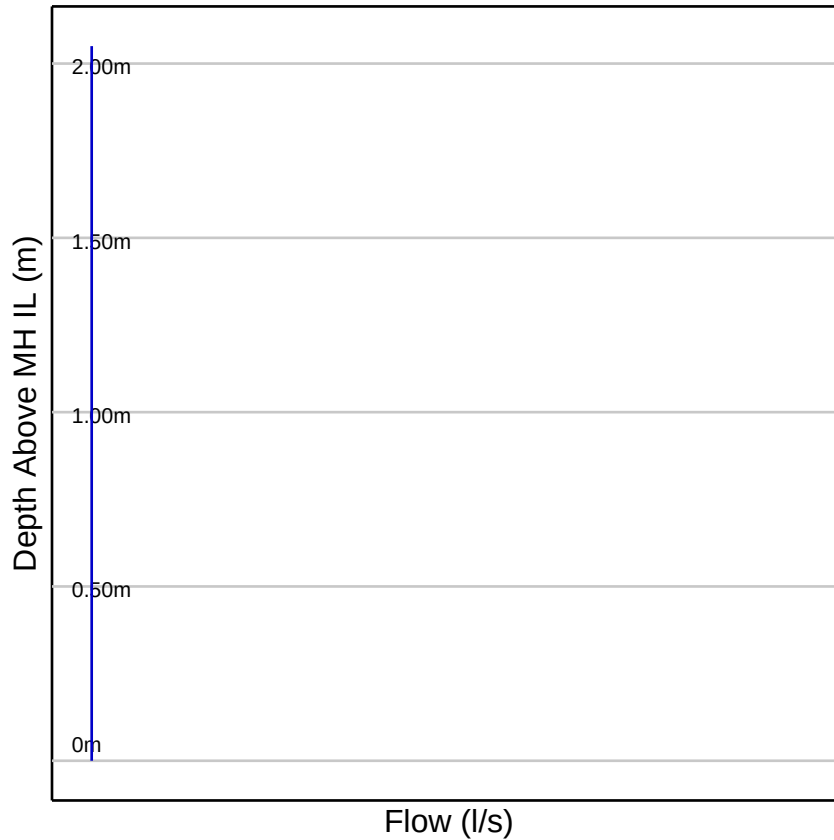
Pump Control

US Manhole	US IL (m)	DS Manhole	DS IL (m)	Startup Depth (m)	Shutoff Depth (m)	Restricted Flow
Rd S38 Pump	106.500	Rd S39 Pump Outfall	106.400	0.100	0.000	Yes*

*Pump Control

Depth Above Manhole Invert (m)	Flow (l/s)
0.000	0.000
2.000	0.000

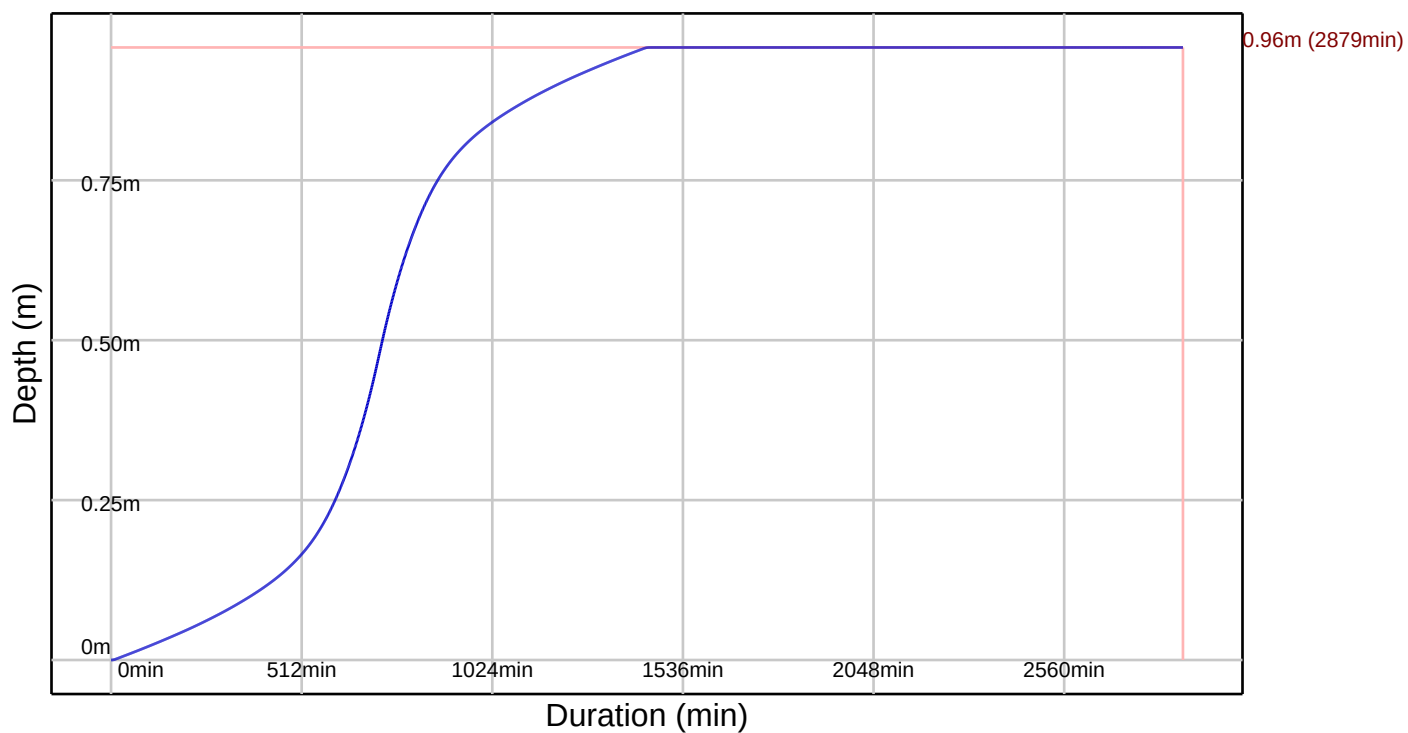
*Pump Control Curve at Rd S38 Pump



Tank Structure at Manhole Rd S38 Pump

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
106.500	1.000	100.00	50.018	50.018	50.018	0.00000000	0.00000000	2.00

Tank 2 at Rd S38 Pump (100Yr+45% 1440Min Summer)



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_350039_404939_v5_0_1 - 2.471.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
100Yr+45% 15Min Winter	121.068	0.00	0.00	100Yr+45% 360Min Summer	13.086	0.00	0.16
100Yr+45% 15Min Summer	121.068	0.00	0.00	100Yr+45% 360Min Winter	13.086	0.00	0.16
100Yr+45% 30Min Winter	80.816	0.00	0.00	100Yr+45% 480Min Summer	10.572	0.00	0.16
100Yr+45% 30Min Summer	80.816	0.00	0.00	100Yr+45% 480Min Winter	10.572	0.00	0.16
100Yr+45% 60Min Winter	51.421	0.00	0.14	100Yr+45% 600Min Summer	8.991	0.00	0.16
100Yr+45% 60Min Summer	51.421	0.00	0.14	100Yr+45% 600Min Winter	8.991	0.00	0.16
100Yr+45% 120Min Winter	30.113	0.00	0.14	100Yr+45% 720Min Summer	7.884	0.00	0.16
100Yr+45% 120Min Summer	30.113	0.00	0.14	100Yr+45% 720Min Winter	7.884	0.00	0.16
100Yr+45% 180Min Summer	21.941	0.00	0.15	100Yr+45% 960Min Summer	6.408	0.00	0.17
100Yr+45% 180Min Winter	21.941	0.00	0.15	100Yr+45% 960Min Winter	6.408	0.00	0.17
100Yr+45% 240Min Summer	17.741	0.00	0.15	100Yr+45% 1440Min Winter	4.783	0.00	0.17
100Yr+45% 240Min Winter	17.741	0.00	0.15	100Yr+45% 1440Min Summer	4.783	0.00	0.17

Simulation Results

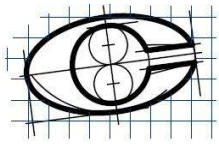
Return Period (yrs) + Climate Change (%):
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Rd S34	15 min Summer	8	114.549	0.036	8.598		OK
Rd S35	15 min Summer	8	111.551	0.051	17.176		OK
Rd S36	15 min Summer	8	108.573	0.073	22.849		OK
Rd S37	15 min Summer	7	107.543	0.043	21.310		OK
Rd S38 Pump	1440 min Summer	1458	107.458	0.958	0.000		Surcharged
Rd S39 Pump Outfall	15 min Winter	0	106.400	0.000	0.000		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	Rd S34	Rd S35	0.043	2.028	8.579	0.126	OK
1.001	15 min Summer	8	Rd S35	Rd S36	0.062	2.493	17.117	0.252	OK
1.002	15 min Summer	8	Rd S36	Rd S37	0.058	3.634	22.762	0.399	OK
1.003	15 min Summer	9	Rd S37	Rd S38 Pump	0.096	3.930	22.767	0.196	OK



Appendix C

Main Site Calculations

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S22	0.014	450	Type D	121.372	120.600	0.622	539038.192	137834.555
S23	0.020	450	Type D	121.639	120.300	1.189	539020.556	137843.543
S24	0.020	450	Type D	121.350	119.900	1.300	539008.826	137821.228
S25	0.005	450	Type D	121.281	119.600	1.531	538992.983	137829.392
S26	0.002	450	Type D	119.518	118.800	0.568	538981.513	137833.079
S27	0.004	450	Type D	119.281	118.600	0.531	538975.932	137827.408
S28	0.000	450	Type D	119.075	117.500	1.425	538968.586	137813.743
S15	0.015	450	Type D	121.359	120.500	0.709	539024.889	137807.305
S16	0.008	450	Type D	121.372	120.350	0.872	539027.454	137797.918
S17	0.006	450	Type D	121.393	120.250	0.993	539024.049	137792.147
S18	0.023	450	Type D	121.066	120.050	0.866	539013.998	137785.228
S19	0.027	450	Type D	121.357	119.600	1.607	539004.785	137796.954
S20	0.007	450	Type D	121.095	119.000	1.945	538979.760	137811.993
S21	0.000	450	Type D	119.645	117.700	1.795	538976.063	137807.632
S1	0.016	450	Type D	120.170	119.500	0.520	539009.043	137743.892
S2	0.001	450	Type D	120.172	119.250	0.772	538988.174	137750.130
S4	0.006	450	Type D	120.251	119.300	0.801	539015.863	137765.382
S5	0.002	450	Type D	120.182	119.100	0.932	539004.187	137768.917
S6	0.010	450	Type D	120.144	118.900	1.094	538998.469	137761.386
S3	0.000	450	Type D	120.046	118.700	1.196	538988.434	137764.400
S8	0.024	450	Type D	120.363	119.600	0.613	539002.825	137774.689
S9	0.012	450	Type D	118.149	117.400	0.599	538975.011	137775.724
S10	0.025	450	Type D	119.222	118.500	0.572	538983.757	137776.066
S7	0.000	1200	Type B	119.692	117.200	2.342	538986.335	137781.871
S11	0.000	1200	Type B	119.812	117.000	2.587	538979.780	137795.325
S13	0.027	450	Type D	119.288	118.500	0.638	538970.902	137791.454
S14	0.023	450	Type D	118.213	117.550	0.513	538956.989	137803.880
Access Rd Dumme	0.042	1350	Type C	119.000	118.000	0.850	538955.959	137811.462
S12 FCC	0.000	1500	Type B	118.348	116.450	1.748	538960.812	137811.547
S29	0.000	450	Type D	118.619	116.350	2.119	538963.460	137817.894
S30	0.000	1200	Type A	119.340	116.100	3.090	538979.637	137833.880
S31	0.000	1200	Type A	121.700	115.700	5.850	539015.861	137853.280
S32	0.000	1200	Unknown	113.800	112.700	0.950	539001.523	137875.078
S33	0.000	1200	Unknown	114.020	112.490	1.380	539001.622	137880.123

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S22	120.600	S23	120.300	Circ	150	19.794	66	0.600	0.622	1.189
1.001	S23	120.300	S24	119.900	Circ	150	25.210	63	0.600	1.189	1.300
1.002	S24	119.900	S25	119.600	Circ	150	17.823	59	0.600	1.300	1.531
1.003	S25	119.600	S26	118.800	Circ	150	12.049	15	0.600	1.531	0.568
1.004	S26	118.800	S27	118.600	Circ	150	7.957	40	0.600	0.568	0.531
1.005	S27	118.600	S28	117.500	Circ	150	15.514	14	0.600	0.531	1.425
1.006	S28	117.500	S12 FCC	116.450	Circ	150	8.078	8	0.600	1.425	1.748
2.000	S15	120.500	S16	120.350	Circ	150	9.730	65	0.600	0.709	0.872
2.001	S16	120.350	S17	120.250	Circ	150	6.701	67	0.600	0.872	0.993
2.002	S17	120.250	S18	120.050	Circ	150	12.202	61	0.600	0.993	0.866
2.003	S18	120.050	S19	119.600	Circ	150	14.912	33	0.600	0.866	1.607
2.004	S19	119.600	S20	119.000	Circ	150	29.197	49	0.600	1.607	1.945
2.005	S20	119.000	S21	117.700	Circ	150	5.716	4	0.600	1.945	1.795
2.006	S21	117.700	S12 FCC	116.450	Circ	150	15.746	13	0.600	1.795	1.748
3.000	S1	119.500	S2	119.250	Circ	150	21.782	87	0.600	0.520	0.772
3.001	S2	119.250	S3	118.700	Circ	150	14.272	26	0.600	0.772	1.196
4.000	S4	119.300	S5	119.100	Circ	150	12.200	61	0.600	0.801	0.932
4.001	S5	119.100	S6	118.900	Circ	150	9.455	47	0.600	0.932	1.094
4.002	S6	118.900	S3	118.700	Circ	150	10.477	52	0.600	1.094	1.196
3.002	S3	118.700	S7	117.200	Circ	150	17.596	12	0.600	1.196	2.342
5.000	S8	119.600	S7	117.200	Circ	150	17.986	7	0.600	0.613	2.342
6.000	S9	117.400	S7	117.200	Circ	150	12.885	64	0.600	0.599	2.342

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
7.000	S10	118.500	S7	117.200	Circ	150	6.352	5	0.600	0.572	2.342
3.003	S7	117.200	S11	117.000	Circ	225	14.965	75	0.600	2.267	2.587
3.004	S11	117.000	S12 FCC	116.450	Circ	225	24.959	45	0.600	2.587	1.673
8.000	S13	118.500	S14	117.550	Circ	150	18.653	20	0.600	0.638	0.513
8.001	S14	117.550	S12 FCC	116.450	Circ	150	8.567	8	0.600	0.513	1.748
9.000	Access Rd Dumme	118.000	S12 FCC	116.525	Circ	150	4.853	3	0.600	0.850	1.673
1.007	S12 FCC	116.450	S29	116.350	Circ	150	6.878	69	0.600	1.748	2.119
1.008	S29	116.350	S30	116.100	Circ	150	22.743	91	0.600	2.119	3.090
1.009	S30	116.100	S31	115.700	Circ	150	41.091	103	0.600	3.090	5.850
1.010	S31	115.700	S32	112.700	Circ	150	26.091	9	0.600	5.850	0.950
1.011	S32	112.700	S33	112.490	Circ	150	5.046	24	0.600	0.950	1.380

Outfall Details

Outfall Manhole S33 : Free Discharge

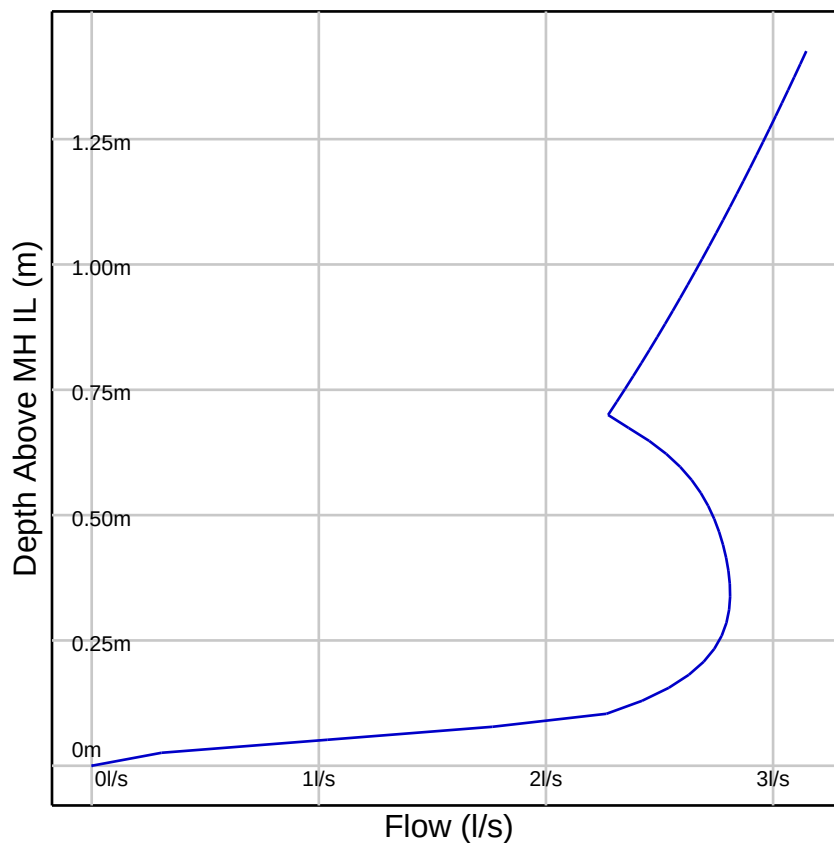
Flow Control Details

Controls within Manhole S12 FCC

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0078-2900-1200-2900	1.200	2.900	0.000	0.344	2.811	0.696	2.268

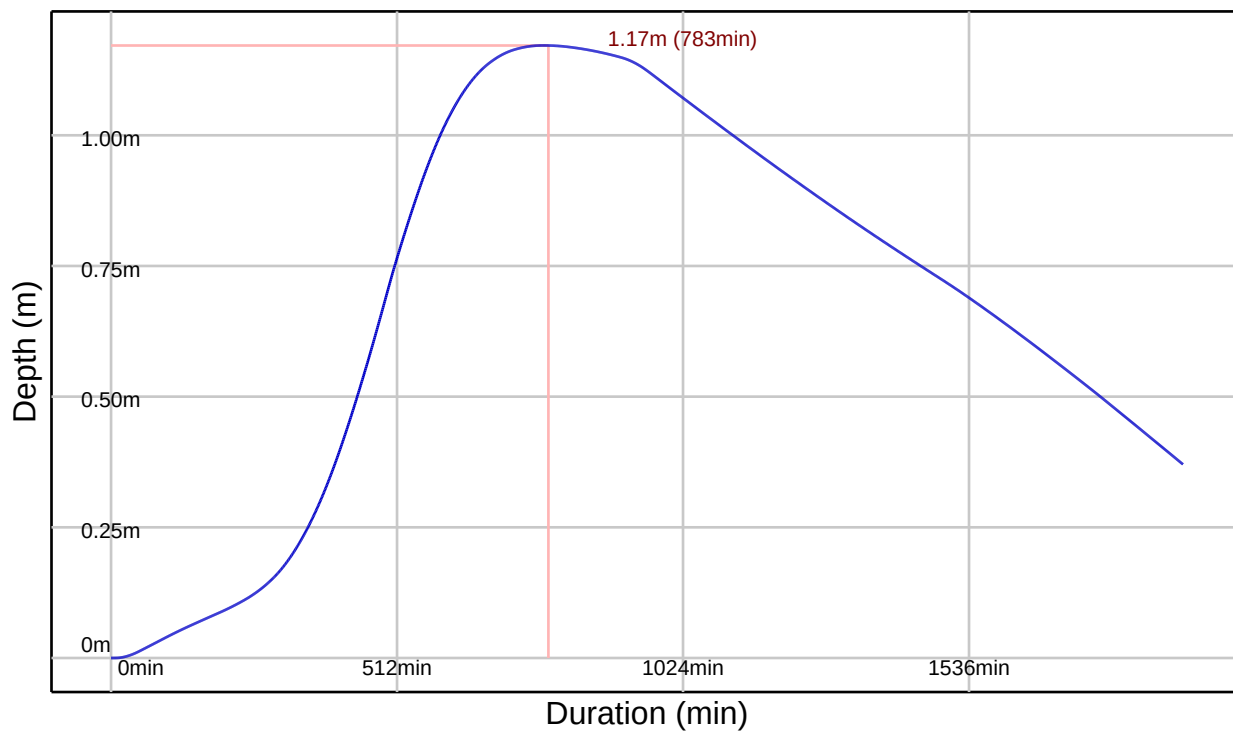
Hydro-Brake® Optimum Control from S12 FCC to S29



Tank Structure at Manhole S12 FCC

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
116.500	1.200	95.00	197.501	187.626	225.151	0.00000000	0.00000000	2.00

Tank 1 at S12 FCC (100Yr+45% 960Min Winter)



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_350039_404939_v5_0_1 - 2.471.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (5, +0%), (30, +0%), (30, +45%), (100, +45%), (500, +0%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	29.200	0.00	0.00	30Yr+45% 15Min Summer	96.751	0.00	0.67
2Yr 15Min Summer	29.200	0.00	0.00	30Yr+45% 15Min Winter	96.751	0.00	0.67
2Yr 30Min Winter	19.000	0.00	0.00	30Yr+45% 30Min Summer	64.137	0.00	0.91
2Yr 30Min Summer	19.000	0.00	0.00	30Yr+45% 30Min Winter	64.137	0.00	0.96
2Yr 60Min Winter	12.089	0.00	0.00	30Yr+45% 60Min Summer	40.577	0.00	1.11
2Yr 60Min Summer	12.089	0.00	0.00	30Yr+45% 60Min Winter	40.577	0.00	1.14
2Yr 120Min Winter	8.045	0.00	0.00	30Yr+45% 120Min Summer	24.173	0.00	1.08
2Yr 120Min Summer	8.045	0.00	0.00	30Yr+45% 120Min Winter	24.173	0.00	1.08
2Yr 180Min Summer	6.312	0.00	0.00	30Yr+45% 180Min Summer	17.785	0.00	1.00
2Yr 180Min Winter	6.312	0.00	0.00	30Yr+45% 180Min Winter	17.785	0.00	1.00
2Yr 240Min Winter	5.223	0.00	0.00	30Yr+45% 240Min Summer	14.398	0.00	0.91
2Yr 240Min Summer	5.223	0.00	0.00	30Yr+45% 240Min Winter	14.398	0.00	0.92
2Yr 360Min Winter	4.032	0.00	0.00	30Yr+45% 360Min Summer	10.660	0.00	0.75
2Yr 360Min Summer	4.032	0.00	0.00	30Yr+45% 360Min Winter	10.660	0.00	0.75
2Yr 480Min Summer	3.355	0.00	0.00	30Yr+45% 480Min Summer	8.623	0.00	0.58
2Yr 480Min Winter	3.355	0.00	0.00	30Yr+45% 480Min Winter	8.623	0.00	0.57
2Yr 600Min Winter	2.894	0.00	0.00	30Yr+45% 600Min Summer	7.325	0.00	0.38
2Yr 600Min Summer	2.894	0.00	0.00	30Yr+45% 600Min Winter	7.325	0.00	0.38
2Yr 720Min Summer	2.558	0.00	0.00	30Yr+45% 720Min Summer	6.414	0.00	0.20
2Yr 720Min Winter	2.558	0.00	0.00	30Yr+45% 720Min Winter	6.414	0.00	0.20
2Yr 960Min Winter	2.106	0.00	0.00	30Yr+45% 960Min Summer	5.212	0.00	0.00
2Yr 960Min Summer	2.106	0.00	0.00	30Yr+45% 960Min Winter	5.212	0.00	0.00
2Yr 1440Min Summer	1.600	0.00	0.00	30Yr+45% 1440Min Summer	3.891	0.00	0.00
2Yr 1440Min Winter	1.600	0.00	0.00	30Yr+45% 1440Min Winter	3.891	0.00	0.00
5Yr 15Min Summer	43.613	0.00	0.00	100Yr+45% 15Min Summer	121.068	0.00	0.78
5Yr 15Min Winter	43.613	0.00	0.00	100Yr+45% 15Min Winter	121.068	0.00	0.80
5Yr 30Min Summer	28.416	0.00	0.16	100Yr+45% 30Min Summer	80.816	0.00	0.97
5Yr 30Min Winter	28.416	0.00	0.16	100Yr+45% 30Min Winter	80.816	0.00	1.03
5Yr 60Min Winter	17.774	0.00	0.32	100Yr+45% 60Min Summer	51.421	0.00	1.20
5Yr 60Min Summer	17.774	0.00	0.33	100Yr+45% 60Min Winter	51.421	0.00	1.26
5Yr 120Min Summer	11.127	0.00	0.23	100Yr+45% 120Min Summer	30.113	0.00	1.30
5Yr 120Min Winter	11.127	0.00	0.22	100Yr+45% 120Min Winter	30.113	0.00	1.32
5Yr 180Min Summer	8.449	0.00	0.11	100Yr+45% 180Min Summer	21.941	0.00	1.24
5Yr 180Min Winter	8.449	0.00	0.10	100Yr+45% 180Min Winter	21.941	0.00	1.24
5Yr 240Min Summer	6.904	0.00	0.00	100Yr+45% 240Min Summer	17.741	0.00	1.15
5Yr 240Min Winter	6.904	0.00	0.00	100Yr+45% 240Min Winter	17.741	0.00	1.15
5Yr 360Min Summer	5.225	0.00	0.00	100Yr+45% 360Min Summer	13.086	0.00	0.92
5Yr 360Min Winter	5.225	0.00	0.00	100Yr+45% 360Min Winter	13.086	0.00	0.93
5Yr 480Min Summer	4.288	0.00	0.00	100Yr+45% 480Min Summer	10.572	0.00	0.74
5Yr 480Min Winter	4.288	0.00	0.00	100Yr+45% 480Min Winter	10.572	0.00	0.75
5Yr 600Min Summer	3.665	0.00	0.00	100Yr+45% 600Min Summer	8.991	0.00	0.59
5Yr 600Min Winter	3.665	0.00	0.00	100Yr+45% 600Min Winter	8.991	0.00	0.60
5Yr 720Min Summer	3.220	0.00	0.00	100Yr+45% 720Min Summer	7.884	0.00	0.47
5Yr 720Min Winter	3.220	0.00	0.00	100Yr+45% 720Min Winter	7.884	0.00	0.48
5Yr 960Min Summer	2.632	0.00	0.00	100Yr+45% 960Min Summer	6.408	0.00	0.20
5Yr 960Min Winter	2.632	0.00	0.00	100Yr+45% 960Min Winter	6.408	0.00	0.20
5Yr 1440Min Winter	1.980	0.00	0.00	100Yr+45% 1440Min Summer	4.783	0.00	0.00
5Yr 1440Min Summer	1.980	0.00	0.00	100Yr+45% 1440Min Winter	4.783	0.00	0.00
30Yr 15Min Summer	66.725	0.00	0.33	500Yr 15Min Summer	109.964	0.00	0.74
30Yr 15Min Winter	66.725	0.00	0.33	500Yr 15Min Winter	109.964	0.00	0.76
30Yr 30Min Summer	44.232	0.00	0.65	500Yr 30Min Summer	74.395	0.00	0.98
30Yr 30Min Winter	44.232	0.00	0.66	500Yr 30Min Winter	74.395	0.00	1.03
30Yr 60Min Summer	27.984	0.00	0.85	500Yr 60Min Summer	47.690	0.00	1.16
30Yr 60Min Winter	27.984	0.00	0.85	500Yr 60Min Winter	47.690	0.00	1.21

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr 120Min Summer	16.671	0.00	0.74	500Yr 120Min Summer	27.962	0.00	1.19
30Yr 120Min Winter	16.671	0.00	0.74	500Yr 120Min Winter	27.962	0.00	1.20
30Yr 180Min Summer	12.265	0.00	0.59	500Yr 180Min Summer	20.444	0.00	1.12
30Yr 180Min Winter	12.265	0.00	0.59	500Yr 180Min Winter	20.444	0.00	1.12
30Yr 240Min Summer	9.929	0.00	0.45	500Yr 240Min Summer	16.644	0.00	1.04
30Yr 240Min Winter	9.929	0.00	0.44	500Yr 240Min Winter	16.644	0.00	1.04
30Yr 360Min Winter	7.352	0.00	0.15	500Yr 360Min Summer	12.383	0.00	0.86
30Yr 360Min Summer	7.352	0.00	0.16	500Yr 360Min Winter	12.383	0.00	0.86
30Yr 480Min Summer	5.947	0.00	0.00	500Yr 480Min Summer	10.040	0.00	0.69
30Yr 480Min Winter	5.947	0.00	0.00	500Yr 480Min Winter	10.040	0.00	0.69
30Yr 600Min Summer	5.051	0.00	0.00	500Yr 600Min Summer	8.547	0.00	0.56
30Yr 600Min Winter	5.051	0.00	0.00	500Yr 600Min Winter	8.547	0.00	0.57
30Yr 720Min Summer	4.423	0.00	0.00	500Yr 720Min Summer	7.494	0.00	0.42
30Yr 720Min Winter	4.423	0.00	0.00	500Yr 720Min Winter	7.494	0.00	0.43
30Yr 960Min Summer	3.594	0.00	0.00	500Yr 960Min Summer	6.087	0.00	0.12
30Yr 960Min Winter	3.594	0.00	0.00	500Yr 960Min Winter	6.087	0.00	0.13
30Yr 1440Min Summer	2.683	0.00	0.00	500Yr 1440Min Winter	4.527	0.00	0.00
30Yr 1440Min Winter	2.683	0.00	0.00	500Yr 1440Min Summer	4.527	0.00	0.00

Simulation Results

Return Period (yrs) + Climate Change (%):

2yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22	15 min Summer	8	120.633	0.033	2.419		OK
S23	15 min Summer	8	120.351	0.051	5.857		OK
S24	15 min Summer	8	119.969	0.069	9.240		OK
S25	15 min Summer	9	119.647	0.047	9.928		OK
S26	15 min Summer	9	118.866	0.066	10.292		OK
S27	15 min Summer	9	118.651	0.051	10.990		OK
S28	15 min Summer	8	117.541	0.041	10.862		OK
S15	15 min Summer	8	120.534	0.034	2.592		OK
S16	15 min Summer	8	120.394	0.044	3.960		OK
S17	15 min Summer	8	120.297	0.047	4.975		OK
S18	15 min Summer	8	120.104	0.054	8.923		OK
S19	15 min Summer	8	119.685	0.085	13.545		OK
S20	15 min Summer	8	119.041	0.041	14.619		OK
S21	15 min Summer	7	117.758	0.058	13.105		OK
S1	15 min Summer	8	119.540	0.040	2.765		OK
S2	15 min Summer	8	119.279	0.029	2.915		OK
S4	15 min Summer	8	119.321	0.021	1.036		OK
S5	15 min Summer	8	119.123	0.023	1.374		OK
S6	15 min Summer	8	118.936	0.036	3.090		OK
S3	15 min Summer	8	118.734	0.034	5.962		OK
S8	15 min Summer	8	119.625	0.025	4.147		OK
S9	15 min Summer	8	117.430	0.030	2.073		OK
S10	15 min Summer	8	118.523	0.023	4.320		OK
S7	15 min Summer	8	117.280	0.080	16.432		OK
S11	15 min Summer	8	117.077	0.077	16.168		OK
S13	15 min Summer	8	118.534	0.034	4.666		OK
S14	15 min Summer	7	117.588	0.038	8.191		OK
Access Rd Dumme	15 min Summer	8	118.027	0.027	7.257		OK
S12 FCC	600 min Summer	388	116.779	0.279	2.747		Surcharged
S29	600 min Summer	388	116.388	0.038	2.759		OK
S30	600 min Summer	389	116.144	0.044	2.759		OK
S31	600 min Summer	389	115.721	0.021	2.759		OK
S32	600 min Summer	389	112.727	0.027	2.759		OK
S33	600 min Summer	389	112.516	0.026	2.759		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S22	S23	0.042	0.586	2.402	0.110	OK
1.001	15 min Summer	8	S23	S24	0.060	0.870	5.785	0.258	OK
1.002	15 min Summer	8	S24	S25	0.058	1.450	9.132	0.396	OK
1.003	15 min Summer	9	S25	S26	0.056	1.649	9.961	0.216	OK
1.004	15 min Summer	9	S26	S27	0.058	1.624	10.328	0.366	OK
1.005	15 min Summer	9	S27	S28	0.046	2.389	11.017	0.231	OK
1.006	120 min Summer	64	S28	S12 FCC	0.089	1.735	5.379	0.083	OK
2.000	15 min Summer	8	S15	S16	0.039	0.709	2.577	0.117	OK
2.001	15 min Summer	8	S16	S17	0.045	0.871	3.939	0.181	OK
2.002	15 min Summer	8	S17	S18	0.051	0.940	4.949	0.217	OK
2.003	15 min Summer	8	S18	S19	0.070	1.102	8.879	0.287	OK
2.004	15 min Summer	8	S19	S20	0.063	1.897	13.409	0.525	OK
2.005	15 min Summer	8	S20	S21	0.050	2.992	14.576	0.170	OK
2.006	120 min Summer	64	S21	S12 FCC	0.093	1.632	7.131	0.141	OK
3.000	15 min Summer	8	S1	S2	0.034	0.895	2.742	0.144	OK
3.001	15 min Summer	8	S2	S3	0.031	1.085	2.891	0.082	OK
4.000	15 min Summer	8	S4	S5	0.022	0.630	1.028	0.045	OK
4.001	15 min Summer	8	S5	S6	0.030	0.552	1.362	0.053	OK
4.002	15 min Summer	8	S6	S3	0.035	0.982	3.071	0.125	OK
3.002	15 min Summer	8	S3	S7	0.057	0.961	5.924	0.113	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
5.000	15 min Summer	8	S8	S7	0.053	1.004	4.136	0.063	OK
6.000	15 min Summer	8	S9	S7	0.055	0.351	2.061	0.093	OK
7.000	15 min Summer	8	S10	S7	0.052	1.212	4.311	0.053	OK
3.003	15 min Summer	9	S7	S11	0.079	1.344	16.200	0.269	OK
3.004	240 min Summer	138	S11	S12 FCC	0.128	0.884	5.368	0.069	OK
8.000	15 min Summer	8	S13	S14	0.035	1.470	4.650	0.115	OK
8.001	120 min Summer	64	S14	S12 FCC	0.087	1.813	4.150	0.065	OK
9.000	180 min Summer	96	Access Rd Dumme	S12 FCC	0.082	1.508	2.809	0.028	OK
1.007	600 min Summer	388	S12 FCC	S29	0.035	0.880	2.759	0.129	OK
1.008	600 min Summer	388	S29	S30	0.041	0.703	2.759	0.148	OK
1.009	600 min Summer	389	S30	S31	0.033	0.974	2.759	0.158	OK
1.010	600 min Summer	389	S31	S32	0.024	1.487	2.759	0.045	OK
1.011	600 min Summer	389	S32	S33	0.027	1.308	2.759	0.076	OK

Return Period (yrs) + Climate Change (%):

5yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22	15 min Summer	8	120.641	0.041	3.613		OK
S23	15 min Summer	8	120.364	0.064	8.751		OK
S24	15 min Summer	8	119.988	0.088	13.816		OK
S25	15 min Summer	8	119.658	0.058	14.960		OK
S26	15 min Summer	9	118.883	0.083	15.361		OK
S27	15 min Summer	9	118.664	0.064	16.403		OK
S28	15 min Summer	9	117.550	0.050	16.444		OK
S15	15 min Summer	8	120.542	0.042	3.871		OK
S16	15 min Summer	8	120.405	0.055	5.916		OK
S17	15 min Summer	8	120.309	0.059	7.435		OK
S18	15 min Summer	8	120.118	0.068	13.333		OK
S19	15 min Summer	8	119.712	0.112	20.244		OK
S20	15 min Summer	9	119.051	0.051	21.604		OK
S21	15 min Summer	7	117.771	0.071	19.704		OK
S1	15 min Summer	8	119.549	0.049	4.128		OK
S2	15 min Summer	8	119.285	0.035	4.356		OK
S4	15 min Summer	8	119.326	0.026	1.548		OK
S5	15 min Summer	8	119.128	0.028	2.053		OK
S6	15 min Summer	8	118.945	0.045	4.619		OK
S3	15 min Summer	8	118.741	0.041	8.920		OK
S8	15 min Summer	8	119.631	0.031	6.193		OK
S9	15 min Summer	8	117.437	0.037	3.096		OK
S10	15 min Summer	8	118.528	0.028	6.451		OK
S7	15 min Summer	8	117.301	0.101	24.573		OK
S11	15 min Summer	8	117.093	0.093	24.262		OK
S13	15 min Summer	8	118.542	0.042	6.968		OK
S14	15 min Summer	8	117.595	0.045	12.881		OK
Access Rd Dumme	15 min Summer	7	118.033	0.033	10.356		OK
S12 FCC	480 min Summer	334	116.875	0.375	2.795		Surcharged
S29	720 min Summer	469	116.389	0.039	2.811		OK
S30	720 min Summer	476	116.144	0.044	2.811		OK
S31	720 min Summer	476	115.722	0.022	2.811		OK
S32	720 min Summer	476	112.727	0.027	2.811		OK
S33	720 min Summer	476	112.516	0.026	2.811		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S22	S23	0.052	0.654	3.590	0.164	OK
1.001	15 min Summer	8	S23	S24	0.076	0.964	8.655	0.386	OK
1.002	15 min Summer	8	S24	S25	0.073	1.605	13.670	0.592	OK
1.003	15 min Summer	8	S25	S26	0.071	1.825	14.899	0.323	OK
1.004	15 min Summer	9	S26	S27	0.073	1.792	15.414	0.546	OK
1.005	15 min Summer	9	S27	S28	0.057	2.660	16.444	0.345	OK
1.006	30 min Summer	18	S28	S12 FCC	0.097	2.352	14.544	0.225	OK
2.000	15 min Summer	8	S15	S16	0.048	0.786	3.852	0.174	OK
2.001	15 min Summer	8	S16	S17	0.057	0.960	5.887	0.271	OK
2.002	15 min Summer	8	S17	S18	0.063	1.042	7.398	0.325	OK
2.003	15 min Summer	8	S18	S19	0.090	1.200	13.276	0.428	OK
2.004	15 min Summer	8	S19	S20	0.082	2.044	20.048	0.785	OK
2.005	15 min Summer	8	S20	S21	0.061	3.311	21.769	0.255	OK
2.006	30 min Summer	18	S21	S12 FCC	0.104	2.269	19.292	0.383	OK
3.000	15 min Summer	8	S1	S2	0.042	1.004	4.098	0.216	OK
3.001	15 min Summer	8	S2	S3	0.038	1.218	4.325	0.123	OK
4.000	15 min Summer	8	S4	S5	0.027	0.709	1.537	0.068	OK
4.001	15 min Summer	8	S5	S6	0.036	0.617	2.039	0.079	OK
4.002	15 min Summer	8	S6	S3	0.043	1.099	4.595	0.187	OK
3.002	15 min Summer	8	S3	S7	0.071	1.073	8.873	0.170	OK
5.000	15 min Summer	8	S8	S7	0.066	1.050	6.179	0.094	OK
6.000	15 min Summer	8	S9	S7	0.069	0.389	3.081	0.139	OK
7.000	15 min Summer	8	S10	S7	0.064	1.236	6.440	0.079	OK
3.003	15 min Summer	8	S7	S11	0.097	1.516	24.262	0.404	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
3.004	120 min Summer	66	S11	S12 FCC	0.138	1.084	10.995	0.142	OK
8.000	15 min Summer	8	S13	S14	0.043	1.646	6.946	0.172	OK
8.001	30 min Summer	18	S14	S12 FCC	0.093	2.331	11.219	0.175	OK
9.000	60 min Summer	33	Access Rd Dumme	S12 FCC	0.086	2.152	7.051	0.071	OK
1.007	720 min Summer	469	S12 FCC	S29	0.035	0.884	2.811	0.131	OK
1.008	720 min Summer	470	S29	S30	0.041	0.707	2.811	0.151	OK
1.009	720 min Summer	476	S30	S31	0.033	0.979	2.811	0.161	OK
1.010	720 min Summer	476	S31	S32	0.024	1.495	2.811	0.046	OK
1.011	720 min Summer	476	S32	S33	0.027	1.315	2.811	0.077	OK

Return Period (yrs) + Climate Change (%):
30yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22	15 min Summer	8	120.651	0.051	5.527		OK
S23	15 min Summer	8	120.382	0.082	13.393		OK
S24	15 min Summer	8	120.019	0.119	21.158		OK
S25	15 min Summer	8	119.674	0.074	22.886		OK
S26	15 min Summer	8	118.911	0.111	23.597		OK
S27	15 min Summer	9	118.682	0.082	25.100		OK
S28	15 min Summer	9	117.564	0.064	25.158		OK
S15	15 min Summer	8	120.553	0.053	5.922		OK
S16	15 min Summer	8	120.420	0.070	9.054		OK
S17	15 min Summer	8	120.326	0.076	11.381		OK
S18	15 min Summer	9	120.172	0.122	19.820		OK
S19	15 min Summer	10	120.011	0.411	26.192		Surcharged
S20	15 min Summer	9	119.062	0.062	30.264		OK
S21	15 min Summer	9	117.783	0.083	30.221		OK
S1	15 min Summer	8	119.562	0.062	6.317		OK
S2	15 min Summer	8	119.294	0.044	6.669		OK
S4	15 min Summer	8	119.332	0.032	2.368		OK
S5	15 min Summer	8	119.135	0.035	3.144		OK
S6	15 min Summer	8	118.956	0.056	7.073		OK
S3	15 min Summer	8	118.751	0.051	13.666		OK
S8	15 min Summer	8	119.638	0.038	9.474		OK
S9	15 min Summer	8	117.446	0.046	4.737		OK
S10	15 min Summer	8	118.534	0.034	9.869		OK
S7	15 min Summer	8	117.331	0.131	37.635		OK
S11	15 min Summer	8	117.117	0.117	37.276		OK
S13	15 min Summer	8	118.552	0.052	10.659		OK
S14	15 min Summer	8	117.606	0.056	19.709		OK
Access Rd Dumme	15 min Summer	7	118.038	0.038	15.840		OK
S12 FCC	360 min Winter	312	117.065	0.565	2.688		Surcharged
S29	30 min Summer	35	116.389	0.039	2.811		OK
S30	30 min Winter	35	116.144	0.044	2.811		OK
S31	1440 min Winter	1231	115.722	0.022	2.811		OK
S32	30 min Summer	36	112.727	0.027	2.811		OK
S33	30 min Summer	36	112.516	0.026	2.811		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S22	S23	0.066	0.728	5.497	0.251	OK
1.001	15 min Summer	8	S23	S24	0.101	1.052	13.262	0.592	OK
1.002	15 min Summer	8	S24	S25	0.096	1.748	20.913	0.906	OK
1.003	15 min Summer	8	S25	S26	0.092	1.997	22.807	0.495	OK
1.004	15 min Summer	9	S26	S27	0.097	1.959	23.586	0.835	OK
1.005	15 min Summer	9	S27	S28	0.073	2.958	25.158	0.528	OK
1.006	15 min Summer	9	S28	S12 FCC	0.107	2.817	25.193	0.390	OK
2.000	15 min Summer	8	S15	S16	0.062	0.863	5.896	0.267	OK
2.001	15 min Summer	8	S16	S17	0.073	1.055	9.013	0.415	OK
2.002	15 min Summer	9	S17	S18	0.098	1.120	11.324	0.497	OK
2.003	15 min Summer	9	S18	S19	0.136	1.252	19.657	0.634	OK
2.004	15 min Summer	10	S19	S20	0.106	2.086	27.785	1.089	OK
2.005	15 min Summer	9	S20	S21	0.072	3.580	30.221	0.353	OK
2.006	15 min Summer	9	S21	S12 FCC	0.116	2.943	30.182	0.599	OK
3.000	15 min Summer	8	S1	S2	0.053	1.130	6.275	0.330	OK
3.001	15 min Summer	8	S2	S3	0.048	1.375	6.628	0.189	OK
4.000	15 min Summer	8	S4	S5	0.033	0.801	2.355	0.103	OK
4.001	15 min Summer	8	S5	S6	0.045	0.692	3.126	0.121	OK
4.002	15 min Summer	8	S6	S3	0.054	1.234	7.039	0.286	OK
3.002	15 min Summer	8	S3	S7	0.091	1.206	13.606	0.260	OK
5.000	15 min Summer	8	S8	S7	0.085	1.021	9.456	0.145	OK
6.000	15 min Summer	8	S9	S7	0.089	0.434	4.717	0.213	OK
7.000	15 min Summer	8	S10	S7	0.083	1.141	9.856	0.122	OK
3.003	15 min Summer	8	S7	S11	0.124	1.691	37.276	0.620	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
3.004	30 min Summer	17	S11	S12 FCC	0.162	1.557	33.504	0.433	OK
8.000	15 min Summer	8	S13	S14	0.054	1.850	10.629	0.264	OK
8.001	15 min Summer	9	S14	S12 FCC	0.102	2.796	19.666	0.306	OK
9.000	30 min Summer	16	Access Rd Dumme	S12 FCC	0.093	2.815	14.669	0.148	OK
1.007	30 min Summer	35	S12 FCC	S29	0.035	0.884	2.811	0.131	OK
1.008	30 min Summer	35	S29	S30	0.041	0.707	2.811	0.151	OK
1.009	30 min Winter	35	S30	S31	0.033	0.979	2.811	0.161	OK
1.010	1440 min Winter	1231	S31	S32	0.024	1.495	2.811	0.046	OK
1.011	30 min Summer	36	S32	S33	0.027	1.315	2.811	0.077	OK

Return Period (yrs) + Climate Change (%):
30yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22	15 min Summer	8	120.662	0.062	8.014		OK
S23	15 min Summer	9	120.475	0.175	18.682		Surcharged
S24	15 min Summer	9	120.226	0.326	28.295		Surcharged
S25	15 min Summer	9	119.690	0.090	30.855		OK
S26	15 min Summer	9	119.012	0.212	31.926		Surcharged
S27	15 min Summer	9	118.700	0.100	33.891		OK
S28	15 min Summer	10	117.580	0.080	33.423		OK
S15	15 min Summer	10	120.719	0.219	6.838		Surcharged
S16	15 min Summer	10	120.706	0.356	9.824		Surcharged
S17	15 min Summer	10	120.686	0.436	11.893		Surcharged
S18	15 min Summer	10	120.632	0.582	21.763		Surcharged
S19	15 min Summer	10	120.403	0.803	33.710		Surcharged
S20	15 min Summer	9	119.069	0.069	36.783		OK
S21	15 min Summer	10	117.800	0.100	36.713		OK
S1	15 min Summer	8	119.576	0.076	9.159		OK
S2	15 min Summer	8	119.303	0.053	9.674		OK
S4	15 min Summer	8	119.339	0.039	3.435		OK
S5	15 min Summer	8	119.142	0.042	4.563		OK
S6	15 min Summer	8	118.969	0.069	10.263		OK
S3	15 min Summer	8	118.763	0.063	19.835		OK
S8	15 min Summer	8	119.646	0.046	13.738		OK
S9	15 min Summer	8	117.456	0.056	6.870		OK
S10	15 min Summer	8	118.541	0.041	14.311		OK
S7	600 min Winter	531	117.415	0.215	0.717		OK
S11	600 min Winter	531	117.415	0.415	0.718		Surcharged
S13	15 min Summer	8	118.565	0.065	15.456		OK
S14	15 min Summer	8	117.618	0.068	28.582		OK
Access Rd Dumme	15 min Summer	8	118.046	0.046	24.043		OK
S12 FCC	600 min Winter	532	117.415	0.915	2.523		Surcharged
S29	1440 min Summer	1936	116.389	0.039	2.811		OK
S30	15 min Winter	72	116.144	0.044	2.811		OK
S31	720 min Winter	1387	115.722	0.022	2.811		OK
S32	960 min Winter	1580	112.727	0.027	2.811		OK
S33	960 min Winter	1580	112.516	0.026	2.811		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	9	S22	S23	0.105	0.778	7.976	0.364	OK
1.001	15 min Summer	9	S23	S24	0.150	1.094	18.025	0.805	Surcharged
1.002	15 min Summer	9	S24	S25	0.120	1.857	28.113	1.218	OK
1.003	15 min Summer	9	S25	S26	0.120	2.036	30.829	0.669	OK
1.004	15 min Summer	9	S26	S27	0.125	2.017	31.698	1.122	OK
1.005	15 min Summer	9	S27	S28	0.089	3.096	33.870	0.711	OK
1.006	15 min Summer	10	S28	S12 FCC	0.115	2.952	33.762	0.523	OK
2.000	15 min Summer	10	S15	S16	0.150	0.909	8.562	0.388	Surcharged
2.001	15 min Winter	9	S16	S17	0.150	1.114	11.194	0.516	Surcharged
2.002	15 min Winter	8	S17	S18	0.150	1.114	13.995	0.615	Surcharged
2.003	30 min Summer	15	S18	S19	0.150	1.298	21.440	0.692	Surcharged
2.004	15 min Summer	10	S19	S20	0.110	2.424	33.484	1.312	OK
2.005	15 min Summer	10	S20	S21	0.084	3.695	36.750	0.430	OK
2.006	15 min Summer	10	S21	S12 FCC	0.125	2.923	36.690	0.728	OK
3.000	15 min Summer	8	S1	S2	0.065	1.247	9.102	0.479	OK
3.001	15 min Summer	8	S2	S3	0.058	1.524	9.619	0.274	OK
4.000	15 min Summer	8	S4	S5	0.040	0.889	3.418	0.150	OK
4.001	15 min Summer	8	S5	S6	0.056	0.761	4.538	0.175	OK
4.002	15 min Summer	8	S6	S3	0.066	1.359	10.216	0.415	OK
3.002	15 min Summer	8	S3	S7	0.106	1.473	19.757	0.378	OK
5.000	15 min Summer	8	S8	S7	0.098	1.122	13.716	0.210	OK
6.000	15 min Summer	8	S9	S7	0.103	0.529	6.845	0.309	OK
7.000	15 min Summer	8	S10	S7	0.096	1.204	14.295	0.176	OK
3.003	600 min Winter	531	S7	S11	0.220	0.989	4.884	0.081	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
3.004	180 min Summer	120	S11	S12 FCC	0.225	1.215	18.075	0.234	OK
8.000	15 min Summer	8	S13	S14	0.067	2.039	15.416	0.382	OK
8.001	15 min Summer	8	S14	S12 FCC	0.109	2.979	28.526	0.444	OK
9.000	15 min Summer	8	Access Rd Dumme	S12 FCC	0.098	3.859	24.016	0.243	OK
1.007	960 min Winter	1579	S12 FCC	S29	0.035	0.884	2.811	0.131	OK
1.008	1440 min Summer	1936	S29	S30	0.041	0.707	2.811	0.151	OK
1.009	1440 min Winter	1915	S30	S31	0.033	0.979	2.811	0.161	OK
1.010	960 min Winter	1580	S31	S32	0.024	1.495	2.811	0.046	OK
1.011	960 min Winter	1580	S32	S33	0.027	1.315	2.811	0.077	OK

Return Period (yrs) + Climate Change (%):
100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22	15 min Summer	10	120.791	0.191	7.985		Surcharged
S23	15 min Summer	10	120.743	0.443	19.938		Surcharged
S24	15 min Summer	9	120.394	0.494	33.777		Surcharged
S25	15 min Summer	10	119.712	0.112	35.763		OK
S26	15 min Summer	10	119.130	0.330	37.057		Surcharged
S27	15 min Summer	9	118.711	0.111	39.503		OK
S28	960 min Winter	775	117.672	0.172	0.546		Surcharged
S15	15 min Summer	11	121.078	0.578	5.056		Flood Risk
S16	15 min Summer	11	121.064	0.714	9.204		Surcharged
S17	15 min Summer	11	121.036	0.786	12.642		Surcharged
S18	15 min Summer	10	120.974	0.924	24.614		Flood Risk
S19	15 min Summer	10	120.702	1.102	38.737		Surcharged
S20	15 min Summer	9	119.074	0.074	41.126		OK
S21	30 min Summer	18	117.817	0.117	39.200		OK
S1	15 min Summer	8	119.587	0.087	11.462		OK
S2	15 min Summer	8	119.310	0.060	12.109		OK
S4	15 min Summer	8	119.344	0.044	4.299		OK
S5	15 min Summer	8	119.147	0.047	5.712		OK
S6	15 min Summer	8	118.979	0.079	12.847		OK
S3	15 min Summer	8	118.772	0.072	24.831		OK
S8	15 min Summer	8	119.652	0.052	17.193		OK
S9	960 min Winter	774	117.672	0.272	0.101		Surcharged
S10	15 min Summer	8	118.546	0.046	17.909		OK
S7	960 min Winter	774	117.672	0.472	0.807		Surcharged
S11	960 min Winter	774	117.672	0.672	0.806		Surcharged
S13	15 min Summer	8	118.573	0.073	19.343		OK
S14	960 min Winter	775	117.672	0.122	0.417		OK
Access Rd Dumme	15 min Summer	8	118.051	0.051	30.088		OK
S12 FCC	960 min Winter	775	117.672	1.172	2.842		Surcharged
S29	960 min Winter	775	116.389	0.039	2.839		OK
S30	960 min Winter	776	116.144	0.044	2.839		OK
S31	960 min Winter	776	115.722	0.022	2.839		OK
S32	960 min Winter	777	112.727	0.027	2.839		OK
S33	960 min Winter	777	112.516	0.026	2.839		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	9	S22	S23	0.150	0.794	9.410	0.430	Surcharged
1.001	15 min Winter	10	S23	S24	0.150	1.111	19.635	0.877	Surcharged
1.002	15 min Summer	10	S24	S25	0.131	2.008	32.912	1.426	OK
1.003	15 min Summer	10	S25	S26	0.131	2.203	36.069	0.783	OK
1.004	15 min Summer	10	S26	S27	0.131	2.289	37.307	1.320	OK
1.005	15 min Summer	10	S27	S28	0.103	3.126	39.666	0.833	OK
1.006	720 min Summer	586	S28	S12 FCC	0.150	1.705	5.580	0.086	Surcharged
2.000	15 min Winter	8	S15	S16	0.150	0.900	9.661	0.438	Surcharged
2.001	30 min Summer	15	S16	S17	0.150	1.071	12.811	0.590	Surcharged
2.002	15 min Winter	13	S17	S18	0.150	1.113	15.238	0.669	Surcharged
2.003	30 min Summer	19	S18	S19	0.150	1.326	23.277	0.751	Surcharged
2.004	15 min Summer	10	S19	S20	0.112	2.648	37.360	1.464	OK
2.005	15 min Summer	10	S20	S21	0.095	3.710	41.387	0.484	OK
2.006	30 min Summer	18	S21	S12 FCC	0.134	2.742	39.480	0.783	OK
3.000	15 min Summer	8	S1	S2	0.074	1.319	11.392	0.599	OK
3.001	15 min Summer	8	S2	S3	0.066	1.616	12.040	0.344	OK
4.000	15 min Summer	8	S4	S5	0.045	0.946	4.279	0.188	OK
4.001	15 min Summer	8	S5	S6	0.063	0.803	5.683	0.219	OK
4.002	15 min Summer	8	S6	S3	0.075	1.436	12.790	0.520	OK
3.002	15 min Summer	8	S3	S7	0.111	1.769	24.739	0.473	OK
5.000	15 min Summer	8	S8	S7	0.101	1.359	17.167	0.262	OK
6.000	360 min Summer	261	S9	S7	0.150	0.336	1.704	0.077	Surcharged
7.000	15 min Summer	8	S10	S7	0.098	1.462	17.890	0.221	OK
3.003	180 min Summer	127	S7	S11	0.225	1.507	22.349	0.372	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
3.004	60 min Winter	40	S11	S12 FCC	0.225	1.515	32.630	0.422	OK
8.000	15 min Summer	8	S13	S14	0.077	2.121	19.308	0.479	OK
8.001	960 min Winter	775	S14	S12 FCC	0.136	1.105	2.224	0.035	OK
9.000	15 min Summer	8	Access Rd Dumme	S12 FCC	0.101	3.904	30.057	0.304	OK
1.007	960 min Winter	775	S12 FCC	S29	0.036	0.887	2.839	0.132	OK
1.008	960 min Winter	776	S29	S30	0.042	0.709	2.839	0.153	OK
1.009	960 min Winter	776	S30	S31	0.033	0.982	2.839	0.162	OK
1.010	960 min Winter	777	S31	S32	0.025	1.499	2.839	0.047	OK
1.011	960 min Winter	777	S32	S33	0.027	1.319	2.839	0.078	OK

Return Period (yrs) + Climate Change (%):
500yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S22	15 min Summer	9	120.670	0.070	8.725		OK
S23	15 min Summer	10	120.628	0.328	18.246		Surcharged
S24	15 min Summer	9	120.322	0.422	31.788		Surcharged
S25	15 min Summer	9	119.701	0.101	33.928		OK
S26	15 min Summer	10	119.077	0.277	34.577		Surcharged
S27	15 min Summer	9	118.706	0.106	36.909		OK
S28	720 min Winter	620	117.603	0.103	0.530		OK
S15	15 min Summer	10	120.907	0.407	7.772		Surcharged
S16	15 min Summer	10	120.893	0.543	10.688		Surcharged
S17	15 min Summer	10	120.870	0.620	12.566		Surcharged
S18	15 min Summer	10	120.815	0.765	23.317		Flood Risk
S19	15 min Summer	10	120.563	0.963	36.447		Surcharged
S20	15 min Summer	9	119.072	0.072	39.144		OK
S21	30 min Summer	18	117.809	0.109	37.404		OK
S1	15 min Summer	8	119.582	0.082	10.410		OK
S2	15 min Summer	8	119.307	0.057	10.997		OK
S4	15 min Summer	8	119.342	0.042	3.904		OK
S5	15 min Summer	8	119.145	0.045	5.186		OK
S6	15 min Summer	8	118.975	0.075	11.666		OK
S3	15 min Summer	8	118.768	0.068	22.550		OK
S8	15 min Summer	8	119.649	0.049	15.616		OK
S9	720 min Winter	621	117.603	0.203	0.097		Surcharged
S10	15 min Summer	8	118.544	0.044	16.267		OK
S7	720 min Winter	621	117.603	0.403	0.778		Surcharged
S11	720 min Winter	621	117.603	0.603	0.778		Surcharged
S13	15 min Summer	8	118.569	0.069	17.568		OK
S14	15 min Summer	8	117.624	0.074	32.501		OK
Access Rd Dumme	15 min Summer	8	118.049	0.049	27.327		OK
S12 FCC	720 min Winter	620	117.603	1.103	2.758		Surcharged
S29	1440 min Winter	2182	116.389	0.039	2.811		OK
S30	960 min Summer	1835	116.144	0.044	2.811		OK
S31	960 min Summer	1835	115.722	0.022	2.811		OK
S32	1440 min Summer	2190	112.727	0.027	2.811		OK
S33	1440 min Summer	2190	112.516	0.026	2.811		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	9	S22	S23	0.110	0.780	9.068	0.414	OK
1.001	30 min Summer	17	S23	S24	0.150	1.094	18.310	0.818	Surcharged
1.002	15 min Summer	9	S24	S25	0.125	1.953	30.812	1.335	OK
1.003	15 min Summer	9	S25	S26	0.125	2.138	33.763	0.733	OK
1.004	15 min Summer	10	S26	S27	0.128	2.177	34.870	1.234	OK
1.005	15 min Summer	10	S27	S28	0.097	3.123	37.022	0.777	OK
1.006	720 min Winter	620	S28	S12 FCC	0.127	1.239	3.383	0.052	OK
2.000	30 min Summer	16	S15	S16	0.150	0.908	8.757	0.397	Surcharged
2.001	15 min Winter	8	S16	S17	0.150	1.075	12.801	0.590	Surcharged
2.002	15 min Winter	13	S17	S18	0.150	1.089	14.511	0.637	Surcharged
2.003	30 min Summer	19	S18	S19	0.150	1.300	22.332	0.721	Surcharged
2.004	15 min Summer	10	S19	S20	0.111	2.547	35.597	1.395	OK
2.005	15 min Summer	10	S20	S21	0.090	3.685	39.259	0.459	OK
2.006	30 min Summer	18	S21	S12 FCC	0.129	2.709	37.792	0.750	OK
3.000	15 min Summer	8	S1	S2	0.070	1.289	10.346	0.544	OK
3.001	15 min Summer	8	S2	S3	0.062	1.576	10.936	0.312	OK
4.000	15 min Summer	8	S4	S5	0.043	0.921	3.885	0.171	OK
4.001	15 min Summer	8	S5	S6	0.060	0.786	5.160	0.199	OK
4.002	15 min Summer	8	S6	S3	0.071	1.403	11.614	0.472	OK
3.002	15 min Summer	8	S3	S7	0.109	1.636	22.464	0.430	OK
5.000	15 min Summer	8	S8	S7	0.100	1.252	15.591	0.238	OK
6.000	480 min Summer	378	S9	S7	0.150	0.313	1.311	0.059	Surcharged
7.000	15 min Summer	8	S10	S7	0.097	1.346	16.249	0.200	OK
3.003	240 min Summer	174	S7	S11	0.225	1.408	17.156	0.285	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
3.004	60 min Winter	45	S11	S12 FCC	0.225	1.491	30.642	0.396	OK
8.000	15 min Summer	8	S13	S14	0.072	2.095	17.536	0.435	OK
8.001	15 min Summer	8	S14	S12 FCC	0.112	3.031	32.345	0.504	OK
9.000	15 min Summer	8	Access Rd Dumme	S12 FCC	0.099	3.985	27.298	0.276	OK
1.007	1440 min Summer	2189	S12 FCC	S29	0.035	0.884	2.811	0.131	OK
1.008	1440 min Winter	2182	S29	S30	0.041	0.707	2.811	0.151	OK
1.009	960 min Summer	1835	S30	S31	0.033	0.979	2.811	0.161	OK
1.010	960 min Winter	1834	S31	S32	0.024	1.495	2.811	0.046	OK
1.011	1440 min Summer	2190	S32	S33	0.027	1.315	2.811	0.077	OK