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The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG		
Date 28/01/2022 15:04 File M43794-JNP-92-XX-CL-C-1...	Designed by Ben.Douglas Checked by	
Micro Drainage	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm Network 1 - Outfall 3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales			
Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.800	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.000
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 Network 1 - Outfall 3

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	12.628	0.158	79.9	0.007	4.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.001	12.695	0.159	79.8	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.002	12.197	0.152	80.2	0.007	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S2.000	15.201	0.190	80.0	0.009	4.00	0.0	0.600	o	100	Pipe/Conduit	☹
S2.001	12.738	0.439	29.0	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.003	9.333	0.233	40.1	0.007	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.004	9.867	0.123	80.2	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.005	12.400	0.683	18.2	0.092	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S3.000	17.167	0.215	79.8	0.032	4.00	0.0	0.600	o	150	Pipe/Conduit	☹
S4.000	15.405	0.315	48.9	0.030	4.00	0.0	0.600	o	150	Pipe/Conduit	☹
S3.001	37.800	0.643	58.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	☹
S1.006	7.254	0.150	48.4	0.015	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.007	11.288	0.188	60.0	0.012	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.008	9.862	0.099	99.6	0.031	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.009	11.602	0.145	80.0	0.014	0.00	0.0	0.600	o	100	Pipe/Conduit	☹
S1.010	9.404	0.118	79.7	0.013	0.00	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)
S1.000	50.00	4.24	48.500	0.007	0.0	0.0	0.0	0.86	6.8	0.9
S1.001	50.00	4.49	48.342	0.016	0.0	0.0	0.0	0.86	6.8	2.2
S1.002	50.00	4.73	48.183	0.023	0.0	0.0	0.0	0.86	6.8	3.1
S2.000	50.00	4.29	48.660	0.009	0.0	0.0	0.0	0.86	6.8	1.2
S2.001	50.00	4.44	48.470	0.018	0.0	0.0	0.0	1.44	11.3	2.4
S1.003	50.00	4.85	48.031	0.048	0.0	0.0	0.0	1.22	9.6	6.5
S1.004	50.00	5.04	47.798	0.059	0.0	0.0	0.0	0.86	6.8	8.0
S1.005	50.00	5.16	47.675	0.151	0.0	0.0	0.0	1.82	14.3	20.4
S3.000	50.00	4.25	47.850	0.032	0.0	0.0	0.0	1.13	19.9	4.3
S4.000	50.00	4.18	47.950	0.030	0.0	0.0	0.0	1.44	25.5	4.1
S3.001	50.00	4.73	47.635	0.062	0.0	0.0	0.0	1.31	23.2	8.4
S1.006	50.00	5.27	46.992	0.228	0.0	0.0	0.0	1.11	8.7	30.9
S1.007	49.54	5.46	46.842	0.240	0.0	0.0	0.0	1.00	7.8	32.2
S1.008	48.69	5.67	46.654	0.271	0.0	0.0	0.0	0.77	6.1	35.7
S1.009	47.82	5.89	46.555	0.285	0.0	0.0	0.0	0.86	6.8	36.9
S1.010	47.14	6.08	46.410	0.298	0.0	0.0	0.0	0.86	6.8	38.0

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The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG		 Micro Drainage
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Micro Drainage	Network 2020.1	

Network Design Table for Storm Network 1 - Outfall 3

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
S1.011	7.633	0.095	80.3	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S1.012	5.700	0.071	80.3	0.013	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S1.013	8.150	0.102	79.9	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S1.014	11.323	0.113	100.2	0.017	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S1.015	11.416	0.114	100.1	0.022	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S1.016	19.938	0.199	100.2	0.019	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S5.000	5.453	0.055	99.1	0.019	4.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S1.017	12.269	1.921	6.4	0.027	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S6.000	31.572	0.210	150.0	0.040	4.00	0.0	0.600	o	225	Pipe/Conduit	⚙
S6.001	11.748	0.078	150.0	0.070	0.00	0.0	0.600	o	225	Pipe/Conduit	⚙
S7.000	31.572	0.316	99.9	0.027	4.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S7.001	1.315	1.375	1.0	0.027	0.00	0.0	0.600	o	100	Pipe/Conduit	⚙
S6.002	15.896	0.106	150.0	0.020	0.00	0.0	0.600	o	225	Pipe/Conduit	⚙
S6.003	12.883	0.085	151.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	⚙
S1.018	7.510	0.075	100.0	0.020	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)
S1.011	46.60	6.22	46.292	0.309	0.0	0.0	0.0	0.86	6.7	39.0
S1.012	46.21	6.33	46.197	0.322	0.0	0.0	0.0	0.86	6.8	40.3
S1.013	45.67	6.49	46.126	0.322	0.0	0.0	0.0	0.86	6.8	40.3
S1.014	44.85	6.74	46.024	0.339	0.0	0.0	0.0	0.77	6.0	41.2
S1.015	44.06	6.99	45.911	0.361	0.0	0.0	0.0	0.77	6.0	43.1
S1.016	42.74	7.42	45.797	0.380	0.0	0.0	0.0	0.77	6.0	44.0
S5.000	50.00	4.12	45.653	0.019	0.0	0.0	0.0	0.77	6.1	2.6
S1.017	42.55	7.48	45.598	0.426	0.0	0.0	0.0	3.08	24.2	49.1
S6.000	50.00	4.49	44.107	0.040	0.0	0.0	0.0	1.07	42.4	5.4
S6.001	50.00	4.68	43.897	0.110	0.0	0.0	0.0	1.07	42.4	14.9
S7.000	50.00	4.68	46.000	0.027	0.0	0.0	0.0	0.77	6.0	3.7
S7.001	50.00	4.69	45.684	0.054	0.0	0.0	0.0	7.98	62.7	7.3
S6.002	50.00	4.94	43.818	0.184	0.0	0.0	0.0	1.07	42.4	24.9
S6.003	50.00	5.14	43.712	0.184	0.0	0.0	0.0	1.06	42.1	24.9
S1.018	42.19	7.61	43.627	0.630	0.0	0.0	0.0	1.00	17.8	72.0

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Manhole Schedules for Storm Network 1 - Outfall 3											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SS1	49.211	0.711	Open Manhole	450	S1.000	48.500	100				
SS2	49.212	0.870	Open Manhole	450	S1.001	48.342	100	S1.000	48.342	100	
SS3	49.245	1.062	Open Manhole	450	S1.002	48.183	100	S1.001	48.183	100	
SS4	49.468	0.808	Open Manhole	450	S2.000	48.660	100				
SS5	49.471	1.001	Open Manhole	450	S2.001	48.470	100	S2.000	48.470	100	
SS6	49.473	1.442	Open Manhole	450	S1.003	48.031	100	S1.002	48.031	100	
								S2.001	48.031	100	
SS7	49.408	1.610	Open Manhole	450	S1.004	47.798	100	S1.003	47.798	100	
SS8	48.821	1.146	Open Manhole	450	S1.005	47.675	100	S1.004	47.675	100	
SS9	48.900	1.050	Open Manhole	450	S3.000	47.850	150				
SS10	49.300	1.350	Open Manhole	450	S4.000	47.950	150				
SS11	48.800	1.165	Open Manhole	1200	S3.001	47.635	150	S3.000	47.635	150	
								S4.000	47.635	150	
SS12	48.209	1.217	Open Manhole	450	S1.006	46.992	100	S1.005	46.992	100	
								S3.001	46.992	150	
SS13	47.965	1.123	Open Manhole	450	S1.007	46.842	100	S1.006	46.842	100	
SS14	47.866	1.212	Open Manhole	450	S1.008	46.654	100	S1.007	46.654	100	
SS15	47.797	1.242	Open Manhole	450	S1.009	46.555	100	S1.008	46.555	100	
SS16	47.701	1.291	Open Manhole	450	S1.010	46.410	100	S1.009	46.410	100	
SS17	47.627	1.335	Open Manhole	450	S1.011	46.292	100	S1.010	46.292	100	
SS18	47.570	1.373	Open Manhole	450	S1.012	46.197	100	S1.011	46.197	100	
SS19	47.547	1.421	Open Manhole	450	S1.013	46.126	100	S1.012	46.126	100	
SS20	47.473	1.449	Open Manhole	450	S1.014	46.024	100	S1.013	46.024	100	
SS21	47.384	1.473	Open Manhole	450	S1.015	45.911	100	S1.014	45.911	100	
SS22	47.293	1.496	Open Manhole	450	S1.016	45.797	100	S1.015	45.797	100	
SS23	46.496	0.843	Open Manhole	450	S5.000	45.653	100				
SS24	46.776	1.178	Open Manhole	450	S1.017	45.598	100	S1.016	45.598	100	
								S5.000	45.598	100	
SS65	46.857	2.750	Open Manhole	1200	S6.000	44.107	225				
SS66	45.609	1.712	Open Manhole	1200	S6.001	43.897	225	S6.000	43.897	225	
SEX S1	47.000	1.000	Open Manhole	450	S7.000	46.000	100				
SEX S2	46.600	0.916	Open Manhole	450	S7.001	45.684	100	S7.000	45.684	100	
SS67	46.600	2.782	Open Manhole	1200	S6.002	43.818	225	S6.001	43.818	225	
								S7.001	44.309	100	
SS68	47.000	3.288	Open Manhole	1200	S6.003	43.712	225	S6.002	43.712	225	
SS25	46.850	3.223	Open Manhole	1800	S1.018	43.627	150	S1.017	43.677	100	
								S6.003	43.627	225	
s	46.850	3.298	Open Manhole	0		OUTFALL		S1.018	43.552	150	
	MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)				
	SS1	470043.437	172017.189	470043.437	172017.189	Required					
	SS2	470031.196	172014.086	470031.196	172014.086	Required					
	SS3	470018.964	172010.687	470018.964	172010.687	Required					
	SS4	469980.235	172000.156	469980.235	172000.156	Required					

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Network 2020.1



Manhole Schedules for Storm Network 1 - Outfall 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SS5	469994.926	172004.059	469994.926	172004.059	Required	
SS6	470007.206	172007.445	470007.206	172007.445	Required	
SS7	470009.650	171998.438	470009.650	171998.438	Required	
SS8	470012.234	171988.915	470012.234	171988.915	Required	
SS9	469975.421	171959.456	469975.421	171959.456	Required	
SS10	469971.434	171991.503	469971.434	171991.503	Required	
SS11	469975.421	171976.623	469975.421	171976.623	Required	
SS12	470013.221	171976.554	470013.221	171976.554	Required	
SS13	470013.360	171969.301	470013.360	171969.301	Required	
SS14	470013.574	171958.015	470013.574	171958.015	Required	
SS15	470013.185	171948.161	470013.185	171948.161	Required	
SS16	470013.313	171936.560	470013.313	171936.560	Required	
SS17	470013.255	171927.156	470013.255	171927.156	Required	
SS18	470011.874	171919.649	470011.874	171919.649	Required	
SS19	470006.276	171918.578	470006.276	171918.578	Required	
SS20	470005.769	171910.444	470005.769	171910.444	Required	
SS21	470005.718	171899.121	470005.718	171899.121	Required	
SS22	470005.719	171887.705	470005.719	171887.705	Required	
SS23	470005.760	171862.314	470005.760	171862.314	Required	

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Manhole Schedules for Storm Network 1 - Outfall 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SS24	470005.760	171867.767	470005.760	171867.767	Required	
SS65	470045.427	171914.992	470045.427	171914.992	Required	
SS66	470045.323	171883.420	470045.323	171883.420	Required	
SEX S1	470034.739	171913.367	470034.739	171913.367	Required	
SEX S2	470034.416	171881.797	470034.416	171881.797	Required	
SS67	470033.924	171880.576	470033.924	171880.576	Required	
SS68	470018.029	171880.620	470018.029	171880.620	Required	
SS25	470018.029	171867.737	470018.029	171867.737	Required	
S	470025.533	171867.444			No Entry	

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PIPELINE SCHEDULES for Storm Network 1 - Outfall 3

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
S1.000	o	100	SS1	49.211	48.500	0.611	Open Manhole		450
S1.001	o	100	SS2	49.212	48.342	0.770	Open Manhole		450
S1.002	o	100	SS3	49.245	48.183	0.962	Open Manhole		450
S2.000	o	100	SS4	49.468	48.660	0.708	Open Manhole		450
S2.001	o	100	SS5	49.471	48.470	0.901	Open Manhole		450
S1.003	o	100	SS6	49.473	48.031	1.342	Open Manhole		450
S1.004	o	100	SS7	49.408	47.798	1.510	Open Manhole		450
S1.005	o	100	SS8	48.821	47.675	1.046	Open Manhole		450
S3.000	o	150	SS9	48.900	47.850	0.900	Open Manhole		450
S4.000	o	150	SS10	49.300	47.950	1.200	Open Manhole		450
S3.001	o	150	SS11	48.800	47.635	1.015	Open Manhole		1200
S1.006	o	100	SS12	48.209	46.992	1.117	Open Manhole		450
S1.007	o	100	SS13	47.965	46.842	1.023	Open Manhole		450
S1.008	o	100	SS14	47.866	46.654	1.112	Open Manhole		450
S1.009	o	100	SS15	47.797	46.555	1.142	Open Manhole		450
S1.010	o	100	SS16	47.701	46.410	1.191	Open Manhole		450
S1.011	o	100	SS17	47.627	46.292	1.235	Open Manhole		450
S1.012	o	100	SS18	47.570	46.197	1.273	Open Manhole		450
S1.013	o	100	SS19	47.547	46.126	1.321	Open Manhole		450
S1.014	o	100	SS20	47.473	46.024	1.349	Open Manhole		450
S1.015	o	100	SS21	47.384	45.911	1.373	Open Manhole		450
S1.016	o	100	SS22	47.293	45.797	1.396	Open Manhole		450
S5.000	o	100	SS23	46.496	45.653	0.743	Open Manhole		450
S1.017	o	100	SS24	46.776	45.598	1.078	Open Manhole		450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
S1.000	12.628	79.9	SS2	49.212	48.342	0.770	Open Manhole		450
S1.001	12.695	79.8	SS3	49.245	48.183	0.962	Open Manhole		450
S1.002	12.197	80.2	SS6	49.473	48.031	1.342	Open Manhole		450
S2.000	15.201	80.0	SS5	49.471	48.470	0.901	Open Manhole		450
S2.001	12.738	29.0	SS6	49.473	48.031	1.342	Open Manhole		450
S1.003	9.333	40.1	SS7	49.408	47.798	1.510	Open Manhole		450
S1.004	9.867	80.2	SS8	48.821	47.675	1.046	Open Manhole		450
S1.005	12.400	18.2	SS12	48.209	46.992	1.117	Open Manhole		450
S3.000	17.167	79.8	SS11	48.800	47.635	1.015	Open Manhole		1200
S4.000	15.405	48.9	SS11	48.800	47.635	1.015	Open Manhole		1200
S3.001	37.800	58.8	SS12	48.209	46.992	1.067	Open Manhole		450
S1.006	7.254	48.4	SS13	47.965	46.842	1.023	Open Manhole		450
S1.007	11.288	60.0	SS14	47.866	46.654	1.112	Open Manhole		450
S1.008	9.862	99.6	SS15	47.797	46.555	1.142	Open Manhole		450
S1.009	11.602	80.0	SS16	47.701	46.410	1.191	Open Manhole		450
S1.010	9.404	79.7	SS17	47.627	46.292	1.235	Open Manhole		450
S1.011	7.633	80.3	SS18	47.570	46.197	1.273	Open Manhole		450
S1.012	5.700	80.3	SS19	47.547	46.126	1.321	Open Manhole		450
S1.013	8.150	79.9	SS20	47.473	46.024	1.349	Open Manhole		450
S1.014	11.323	100.2	SS21	47.384	45.911	1.373	Open Manhole		450
S1.015	11.416	100.1	SS22	47.293	45.797	1.396	Open Manhole		450
S1.016	19.938	100.2	SS24	46.776	45.598	1.078	Open Manhole		450
S5.000	5.453	99.1	SS24	46.776	45.598	1.078	Open Manhole		450
S1.017	12.269	6.4	SS25	46.850	43.677	3.073	Open Manhole		1800

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PIPELINE SCHEDULES for Storm Network 1 - Outfall 3

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S6.000	o	225	SS65	46.857	44.107	2.525	Open Manhole	1200
S6.001	o	225	SS66	45.609	43.897	1.487	Open Manhole	1200
S7.000	o	100	SEX S1	47.000	46.000	0.900	Open Manhole	450
S7.001	o	100	SEX S2	46.600	45.684	0.816	Open Manhole	450
S6.002	o	225	SS67	46.600	43.818	2.557	Open Manhole	1200
S6.003	o	225	SS68	47.000	43.712	3.063	Open Manhole	1200
S1.018	o	150	SS25	46.850	43.627	3.073	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S6.000	31.572	150.0	SS66	45.609	43.897	1.487	Open Manhole	1200
S6.001	11.748	150.0	SS67	46.600	43.818	2.557	Open Manhole	1200
S7.000	31.572	99.9	SEX S2	46.600	45.684	0.816	Open Manhole	450
S7.001	1.315	1.0	SS67	46.600	44.309	2.191	Open Manhole	1200
S6.002	15.896	150.0	SS68	47.000	43.712	3.063	Open Manhole	1200
S6.003	12.883	151.6	SS25	46.850	43.627	2.998	Open Manhole	1800
S1.018	7.510	100.0	S	46.850	43.552	3.148	Open Manhole	0

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<u>Setting Out Information - True Coordinates (Storm Network 1 - Outfall 3)</u>									
PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Layout (North)	
S1.000	SS1	450		470043.437	172017.189	470043.437	172017.189		
S1.001	SS2	450		470031.196	172014.086	470031.196	172014.086		
S1.002	SS3	450		470018.964	172010.687	470018.964	172010.687		
S2.000	SS4	450		469980.235	172000.156	469980.235	172000.156		
S2.001	SS5	450		469994.926	172004.059	469994.926	172004.059		
S1.003	SS6	450		470007.206	172007.445	470007.206	172007.445		
S1.004	SS7	450		470009.650	171998.438	470009.650	171998.438		
S1.005	SS8	450		470012.234	171988.915	470012.234	171988.915		
S3.000	SS9	450		469975.421	171959.456	469975.421	171959.456		
S4.000	SS10	450		469971.434	171991.503	469971.434	171991.503		
S3.001	SS11	1200		469975.421	171976.623	469975.421	171976.623		
S1.006	SS12	450		470013.221	171976.554	470013.221	171976.554		
S1.007	SS13	450		470013.360	171969.301	470013.360	171969.301		
S1.008	SS14	450		470013.574	171958.015	470013.574	171958.015		
S1.009	SS15	450		470013.185	171948.161	470013.185	171948.161		
S1.010	SS16	450		470013.313	171936.560	470013.313	171936.560		
S1.011	SS17	450		470013.255	171927.156	470013.255	171927.156		
S1.012	SS18	450		470011.874	171919.649	470011.874	171919.649		
S1.013	SS19	450		470006.276	171918.578	470006.276	171918.578		
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Setting Out Information - True Coordinates (Storm Network 1 - Outfall 3)

PN	USMH Name	Dia/Len (mm)	width (mm)	US Easting (m)	US Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Layout (North)
S1.014	SS20	450		470005.769	171910.444	470005.769	171910.444	
S1.015	SS21	450		470005.718	171899.121	470005.718	171899.121	
S1.016	SS22	450		470005.719	171887.705	470005.719	171887.705	
S5.000	SS23	450		470005.760	171862.314	470005.760	171862.314	
S1.017	SS24	450		470005.760	171867.767	470005.760	171867.767	
S6.000	SS65	1200		470045.427	171914.992	470045.427	171914.992	
S6.001	SS66	1200		470045.323	171883.420	470045.323	171883.420	
S7.000	SEX S1	450		470034.739	171913.367	470034.739	171913.367	
S7.001	SEX S2	450		470034.416	171881.797	470034.416	171881.797	
S6.002	SS67	1200		470033.924	171880.576	470033.924	171880.576	
S6.003	SS68	1200		470018.029	171880.620	470018.029	171880.620	
S1.018	SS25	1800		470018.029	171867.737	470018.029	171867.737	

PN	DSMH Name	Dia/Len (mm)	width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
S1.018	S	0		470025.533	171867.444	

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Area Summary for Storm Network 1 - Outfall 3

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.007	0.007	0.007
1.001	-	-	100	0.009	0.009	0.009
1.002	-	-	100	0.007	0.007	0.007
2.000	-	-	100	0.009	0.009	0.009
2.001	-	-	100	0.009	0.009	0.009
1.003	-	-	100	0.007	0.007	0.007
1.004	-	-	100	0.011	0.011	0.011
1.005	-	-	100	0.092	0.092	0.092
3.000	-	-	100	0.032	0.032	0.032
4.000	-	-	100	0.030	0.030	0.030
3.001	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.015	0.015	0.015
1.007	-	-	100	0.012	0.012	0.012
1.008	-	-	100	0.031	0.031	0.031
1.009	-	-	100	0.014	0.014	0.014
1.010	-	-	100	0.013	0.013	0.013
1.011	-	-	100	0.011	0.011	0.011
1.012	-	-	100	0.013	0.013	0.013
1.013	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.017	0.017	0.017
1.015	-	-	100	0.022	0.022	0.022
1.016	-	-	100	0.019	0.019	0.019
5.000	-	-	100	0.019	0.019	0.019
1.017	-	-	100	0.027	0.027	0.027
6.000	-	-	100	0.040	0.040	0.040
6.001	-	-	100	0.070	0.070	0.070
7.000	-	-	100	0.027	0.027	0.027
7.001	-	-	100	0.027	0.027	0.027
6.002	-	-	100	0.020	0.020	0.020
6.003	-	-	100	0.000	0.000	0.000
1.018	-	-	100	0.020	0.020	0.020
				Total	Total	Total
				0.630	0.630	0.630

Free Flowing Outfall Details for Storm Network 1 - Outfall 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.018	S	46.850	43.552	0.000	0	0

Simulation Criteria for Storm Network 1 - Outfall 3

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	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 Online Controls	1	Number of Storage Structures	20
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.700	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm Network 1 - Outfall 3

Hydro-Brake® Optimum Manhole: SS25, DS/PN: S1.018, Volume (m³): 8.7

Unit Reference	MD-SHE-0101-5300-1500-5300
Design Head (m)	1.500
Design Flow (l/s)	5.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	101
Invert Level (m)	43.627
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	5.3	Kick-Flo®	0.903	4.2
Flush-Flo™	0.442	5.3	Mean Flow over Head Range	-	4.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.4	1.200	4.8	3.000	7.3	7.000	10.9
0.200	4.7	1.400	5.1	3.500	7.9	7.500	11.3
0.300	5.1	1.600	5.5	4.000	8.4	8.000	11.7
0.400	5.2	1.800	5.8	4.500	8.9	8.500	12.0
0.500	5.2	2.000	6.1	5.000	9.3	9.000	12.3
0.600	5.2	2.200	6.3	5.500	9.8	9.500	12.7
0.800	4.7	2.400	6.6	6.000	10.2		
1.000	4.4	2.600	6.8	6.500	10.6		

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Storage Structures for Storm Network 1 - Outfall 3

Porous Car Park Manhole: SS1, DS/PN: S1.000

Infiltration Coefficient Base (m/hr)	0.00000	width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	7.0
Max Percolation (l/s)	13.6	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	48.500	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: SS2, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00000	width (m)	7.9
Membrane Percolation (mm/hr)	1000	Length (m)	7.9
Max Percolation (l/s)	17.3	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	48.342	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: SS3, DS/PN: S1.002

Infiltration Coefficient Base (m/hr)	0.00000	width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	7.0
Max Percolation (l/s)	13.6	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	48.183	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: SS4, DS/PN: S2.000

Infiltration Coefficient Base (m/hr)	0.00000	width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	6.5
Max Percolation (l/s)	11.7	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	48.660	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: SS5, DS/PN: S2.001

Infiltration Coefficient Base (m/hr)	0.00000	width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	6.5
Max Percolation (l/s)	11.7	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	48.470	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: SS6, DS/PN: S1.003

Infiltration Coefficient Base (m/hr)	0.00000	width (m)	5.4
Membrane Percolation (mm/hr)	1000	Length (m)	5.4
Max Percolation (l/s)	8.1	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	48.031	Cap Volume Depth (m)	1.000

Porous Car Park Manhole: SS7, DS/PN: S1.004

Infiltration Coefficient Base (m/hr)	0.00000	width (m)	8.7
Membrane Percolation (mm/hr)	1000	Length (m)	8.7
Max Percolation (l/s)	21.0	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	47.748	Cap Volume Depth (m)	1.000

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<u>Porous Car Park Manhole: SS8, DS/PN: S1.005</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>9.2</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>9.2</td></tr><tr><td>Max Percolation (l/s)</td><td>23.5</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>47.625</td><td>Cap Volume Depth (m)</td><td>0.800</td></tr></table> <u>Porous Car Park Manhole: SS12, DS/PN: S1.006</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>9.9</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>9.9</td></tr><tr><td>Max Percolation (l/s)</td><td>27.2</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>47.042</td><td>Cap Volume Depth (m)</td><td>0.800</td></tr></table> <u>Porous Car Park Manhole: SS13, DS/PN: S1.007</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>8.4</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>8.4</td></tr><tr><td>Max Percolation (l/s)</td><td>19.6</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>46.842</td><td>Cap Volume Depth (m)</td><td>0.800</td></tr></table> <u>Porous Car Park Manhole: SS14, DS/PN: S1.008</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>8.7</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>8.7</td></tr><tr><td>Max Percolation (l/s)</td><td>21.0</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>46.529</td><td>Cap Volume Depth (m)</td><td>1.000</td></tr></table> <u>Porous Car Park Manhole: SS15, DS/PN: S1.009</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>9.8</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>9.8</td></tr><tr><td>Max Percolation (l/s)</td><td>26.7</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>46.305</td><td>Cap Volume Depth (m)</td><td>1.100</td></tr></table> <u>Porous Car Park Manhole: SS16, DS/PN: S1.010</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>9.3</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>9.3</td></tr><tr><td>Max Percolation (l/s)</td><td>24.0</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>46.035</td><td>Cap Volume Depth (m)</td><td>1.300</td></tr></table> <u>Porous Car Park Manhole: SS17, DS/PN: S1.011</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>8.3</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>8.3</td></tr><tr><td>Max Percolation (l/s)</td><td>19.1</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>45.792</td><td>Cap Volume Depth (m)</td><td>1.000</td></tr></table>			Infiltration Coefficient Base (m/hr)	0.00000	width (m)	9.2	Membrane Percolation (mm/hr)	1000	Length (m)	9.2	Max Percolation (l/s)	23.5	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	47.625	Cap Volume Depth (m)	0.800	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	9.9	Membrane Percolation (mm/hr)	1000	Length (m)	9.9	Max Percolation (l/s)	27.2	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	47.042	Cap Volume Depth (m)	0.800	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	8.4	Membrane Percolation (mm/hr)	1000	Length (m)	8.4	Max Percolation (l/s)	19.6	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	46.842	Cap Volume Depth (m)	0.800	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	8.7	Membrane Percolation (mm/hr)	1000	Length (m)	8.7	Max Percolation (l/s)	21.0	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	46.529	Cap Volume Depth (m)	1.000	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	9.8	Membrane Percolation (mm/hr)	1000	Length (m)	9.8	Max Percolation (l/s)	26.7	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	46.305	Cap Volume Depth (m)	1.100	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	9.3	Membrane Percolation (mm/hr)	1000	Length (m)	9.3	Max Percolation (l/s)	24.0	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	46.035	Cap Volume Depth (m)	1.300	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	8.3	Membrane Percolation (mm/hr)	1000	Length (m)	8.3	Max Percolation (l/s)	19.1	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	45.792	Cap Volume Depth (m)	1.000
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<u>Porous Car Park Manhole: SS20, DS/PN: S1.014</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>10.4</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>10.4</td></tr><tr><td>Max Percolation (l/s)</td><td>30.0</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>45.274</td><td>Cap Volume Depth (m)</td><td>1.800</td></tr></table> <u>Porous Car Park Manhole: SS21, DS/PN: S1.015</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>14.8</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>14.8</td></tr><tr><td>Max Percolation (l/s)</td><td>60.8</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>45.036</td><td>Cap Volume Depth (m)</td><td>1.000</td></tr></table> <u>Porous Car Park Manhole: SS22, DS/PN: S1.016</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>11.3</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>11.3</td></tr><tr><td>Max Percolation (l/s)</td><td>35.5</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>44.922</td><td>Cap Volume Depth (m)</td><td>1.400</td></tr></table> <u>Porous Car Park Manhole: SS23, DS/PN: S5.000</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>11.4</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>11.4</td></tr><tr><td>Max Percolation (l/s)</td><td>36.1</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>45.600</td><td>Cap Volume Depth (m)</td><td>0.500</td></tr></table> <u>Porous Car Park Manhole: SS24, DS/PN: S1.017</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>width (m)</td><td>12.6</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>12.6</td></tr><tr><td>Max Percolation (l/s)</td><td>44.1</td><td>Slope (1:X)</td><td>200.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>44.723</td><td>Cap Volume Depth (m)</td><td>1.400</td></tr></table> <u>Cellular Storage Manhole: SS66, DS/PN: S6.001</u> <table><tr><td>Invert Level (m)</td><td>44.032</td><td>Safety Factor</td><td>2.0</td></tr><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Porosity</td><td>0.95</td></tr><tr><td>Infiltration Coefficient Side (m/hr)</td><td>0.00000</td><td></td><td></td></tr></table> <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Inf. Area (m²)</td></tr><tr><td>0.000</td><td>150.0</td><td>0.0</td><td>0.810</td><td>0.0</td><td>0.0</td></tr><tr><td>0.800</td><td>150.0</td><td>0.0</td><td></td><td></td><td></td></tr></table>			Infiltration Coefficient Base (m/hr)	0.00000	width (m)	10.4	Membrane Percolation (mm/hr)	1000	Length (m)	10.4	Max Percolation (l/s)	30.0	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	45.274	Cap Volume Depth (m)	1.800	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	14.8	Membrane Percolation (mm/hr)	1000	Length (m)	14.8	Max Percolation (l/s)	60.8	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	45.036	Cap Volume Depth (m)	1.000	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	11.3	Membrane Percolation (mm/hr)	1000	Length (m)	11.3	Max Percolation (l/s)	35.5	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	44.922	Cap Volume Depth (m)	1.400	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	11.4	Membrane Percolation (mm/hr)	1000	Length (m)	11.4	Max Percolation (l/s)	36.1	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	45.600	Cap Volume Depth (m)	0.500	Infiltration Coefficient Base (m/hr)	0.00000	width (m)	12.6	Membrane Percolation (mm/hr)	1000	Length (m)	12.6	Max Percolation (l/s)	44.1	Slope (1:X)	200.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	44.723	Cap Volume Depth (m)	1.400	Invert Level (m)	44.032	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)	0.000	150.0	0.0	0.810	0.0	0.0	0.800	150.0	0.0			
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The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG		
Date 28/01/2022 15:04 File M43794-JNP-92-XX-CL-C-1...	Designed by Ben.Douglas Checked by	
Micro Drainage	Network 2020.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm Network 1 - Outfall 3

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 1 Number of Storage Structures 20 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750
Region England and Wales Ratio R 0.400 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 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.	Water Level (m)
S1.000	SS1	30 winter	1	+0%					48.519
S1.001	SS2	30 winter	1	+0%					48.368
S1.002	SS3	30 winter	1	+0%	100/15 Summer				48.213
S2.000	SS4	15 winter	1	+0%					48.683
S2.001	SS5	30 winter	1	+0%					48.495
S1.003	SS6	30 winter	1	+0%	100/15 Summer				48.070
S1.004	SS7	60 winter	1	+0%	30/15 Summer				47.841
S1.005	SS8	15 winter	1	+0%	30/15 Summer				47.730
S3.000	SS9	15 winter	1	+0%	100/15 Summer				47.900
S4.000	SS10	15 winter	1	+0%	100/15 Summer				47.992
S3.001	SS11	15 winter	1	+0%	100/15 Summer				47.699
S1.006	SS12	30 winter	1	+0%	1/15 Summer				47.141
S1.007	SS13	60 winter	1	+0%	1/15 Summer				46.988
S1.008	SS14	60 winter	1	+0%	1/15 Summer				46.814
S1.009	SS15	120 winter	1	+0%	1/120 Winter				46.662
S1.010	SS16	120 winter	1	+0%	30/60 Summer				46.490
S1.011	SS17	360 winter	1	+0%	30/60 Summer				46.350
S1.012	SS18	360 winter	1	+0%	30/60 Summer				46.258
S1.013	SS19	360 winter	1	+0%	30/60 Summer				46.185
S1.014	SS20	1440 winter	1	+0%	30/120 Summer				46.060
S1.015	SS21	1440 winter	1	+0%	100/240 Summer				45.523
S1.016	SS22	1440 winter	1	+0%	100/240 Summer				45.055
S5.000	SS23	360 winter	1	+0%					45.666
S1.017	SS24	1440 winter	1	+0%					44.941
S6.000	SS65	15 winter	1	+0%	100/15 Winter				44.163
S6.001	SS66	30 winter	1	+0%	30/15 Summer				44.066
S7.000	SEX S1	15 winter	1	+0%	30/15 Summer	100/15 summer			46.058
S7.001	SEX S2	15 winter	1	+0%					45.715
S6.002	SS67	15 winter	1	+0%	1/15 Summer				44.117
S6.003	SS68	15 winter	1	+0%	1/15 Summer				44.111
S1.018	SS25	15 winter	1	+0%	1/15 Summer				44.105

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS1	-0.081	0.000	0.08		7	0.5	OK	
S1.001	SS2	-0.074	0.000	0.15		9	1.0	OK	
S1.002	SS3	-0.070	0.000	0.19		10	1.2	OK	
S2.000	SS4	-0.077	0.000	0.12		6	0.8	OK	
S2.001	SS5	-0.075	0.000	0.14		8	1.5	OK	
S1.003	SS6	-0.061	0.000	0.32		14	2.8	OK	
S1.004	SS7	-0.057	0.000	0.39		54	2.5	OK	
S1.005	SS8	-0.045	0.000	0.58		23	7.8	OK	
S3.000	SS9	-0.100	0.000	0.24			4.4	OK	
S4.000	SS10	-0.108	0.000	0.18			4.2	OK	
S3.001	SS11	-0.086	0.000	0.38			8.5	OK	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm Network 1 - Outfall 3

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.006	SS12	0.049	0.000	1.13		10	9.0	SURCHARGED	
S1.007	SS13	0.046	0.000	1.00		14	7.3	SURCHARGED	
S1.008	SS14	0.060	0.000	1.29		28	7.2	SURCHARGED	
S1.009	SS15	0.007	0.000	1.04			6.6	SURCHARGED	
S1.010	SS16	-0.020	0.000	1.00			6.3	OK	
S1.011	SS17	-0.042	0.000	0.64			4.0	OK	
S1.012	SS18	-0.039	0.000	0.68			4.1	OK	
S1.013	SS19	-0.041	0.000	0.66			4.1	OK	
S1.014	SS20	-0.064	0.000	0.28			1.6	OK	
S1.015	SS21	-0.488	0.000	0.00			0.0	OK	
S1.016	SS22	-0.842	0.000	0.00			0.0	OK	
S5.000	SS23	-0.087	0.000	0.04			0.2	OK	
S1.017	SS24	-0.757	0.000	0.00			0.0	OK	
S6.000	SS65	-0.169	0.000	0.14			5.5	OK	
S6.001	SS66	-0.055	0.000	0.21		15	7.7	OK	
S7.000	SEX S1	-0.042	0.000	0.62			3.6	OK	
S7.001	SEX S2	-0.069	0.000	0.20			6.6	OK	
S6.002	SS67	0.074	0.000	0.37			14.0	SURCHARGED	
S6.003	SS68	0.173	0.000	0.24			8.9	SURCHARGED	
S1.018	SS25	0.328	0.000	0.34			5.2	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm Network 1 - Outfall 3

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 1 Number of Storage Structures 20 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.400 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 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.	Water Level (m)
S1.000	SS1	15 winter	30	+0%					48.535
S1.001	SS2	15 winter	30	+0%					48.392
S1.002	SS3	30 winter	30	+0%	100/15 Summer				48.241
S2.000	SS4	15 winter	30	+0%					48.702
S2.001	SS5	15 winter	30	+0%					48.516
S1.003	SS6	30 winter	30	+0%	100/15 Summer				48.124
S1.004	SS7	30 winter	30	+0%	30/15 Summer				47.995
S1.005	SS8	30 winter	30	+0%	30/15 Summer				47.915
S3.000	SS9	15 winter	30	+0%	100/15 Summer				47.933
S4.000	SS10	15 winter	30	+0%	100/15 Summer				48.019
S3.001	SS11	15 winter	30	+0%	100/15 Summer				47.757
S1.006	SS12	120 winter	30	+0%	1/15 Summer				47.544
S1.007	SS13	120 winter	30	+0%	1/15 Summer				47.329
S1.008	SS14	120 winter	30	+0%	1/15 Summer				47.057
S1.009	SS15	240 winter	30	+0%	1/120 Winter				46.850
S1.010	SS16	240 winter	30	+0%	30/60 Summer				46.666
S1.011	SS17	240 winter	30	+0%	30/60 Summer				46.521
S1.012	SS18	240 winter	30	+0%	30/60 Summer				46.400
S1.013	SS19	360 winter	30	+0%	30/60 Summer				46.305
S1.014	SS20	360 winter	30	+0%	30/120 Summer				46.179
S1.015	SS21	480 winter	30	+0%	100/240 Summer				46.011
S1.016	SS22	1440 winter	30	+0%	100/240 Summer				45.848
S5.000	SS23	60 winter	30	+0%					45.690
S1.017	SS24	1440 winter	30	+0%					45.615
S6.000	SS65	60 winter	30	+0%	100/15 Winter				44.222
S6.001	SS66	60 winter	30	+0%	30/15 Summer				44.219
S7.000	SEX S1	15 winter	30	+0%	30/15 Summer	100/15 summer			46.407
S7.001	SEX S2	15 winter	30	+0%					45.735
S6.002	SS67	60 winter	30	+0%	1/15 Summer				44.215
S6.003	SS68	60 winter	30	+0%	1/15 Summer				44.206
S1.018	SS25	60 winter	30	+0%	1/15 Summer				44.198

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS1	-0.065	0.000	0.27		6	1.7	OK	
S1.001	SS2	-0.050	0.000	0.49		7	3.1	OK	
S1.002	SS3	-0.042	0.000	0.64		11	4.1	OK	
S2.000	SS4	-0.058	0.000	0.37		6	2.4	OK	
S2.001	SS5	-0.054	0.000	0.43		6	4.6	OK	
S1.003	SS6	-0.007	0.000	0.96		8	8.5	OK	
S1.004	SS7	0.097	0.000	0.91		14	5.7	SURCHARGED	
S1.005	SS8	0.140	0.000	0.94		21	12.7	SURCHARGED	
S3.000	SS9	-0.067	0.000	0.59			10.9	OK	
S4.000	SS10	-0.081	0.000	0.43			10.2	OK	
S3.001	SS11	-0.028	0.000	0.91			20.5	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm Network 1 - Outfall 3

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.006	SS12	0.452	0.000	1.38		40	10.9	SURCHARGED	
S1.007	SS13	0.387	0.000	1.25		50	9.2	SURCHARGED	
S1.008	SS14	0.303	0.000	1.57		71	8.8	SURCHARGED	
S1.009	SS15	0.195	0.000	1.20		92	7.6	SURCHARGED	
S1.010	SS16	0.156	0.000	1.18			7.4	SURCHARGED	
S1.011	SS17	0.129	0.000	1.15			7.1	SURCHARGED	
S1.012	SS18	0.103	0.000	1.20			7.2	SURCHARGED	
S1.013	SS19	0.079	0.000	1.15			7.2	SURCHARGED	
S1.014	SS20	0.055	0.000	1.24			7.0	SURCHARGED	
S1.015	SS21	0.000	0.000	1.00			5.7	OK	
S1.016	SS22	-0.049	0.000	0.51			3.0	OK	
S5.000	SS23	-0.063	0.000	0.29			1.6	OK	
S1.017	SS24	-0.083	0.000	0.07			1.6	OK	
S6.000	SS65	-0.110	0.000	0.17			6.6	OK	
S6.001	SS66	0.097	0.000	0.15		51	5.3	SURCHARGED	
S7.000	SEX S1	0.307	0.000	1.37			8.1	SURCHARGED	3
S7.001	SEX S2	-0.049	0.000	0.51			16.6	OK	
S6.002	SS67	0.172	0.000	0.20			7.5	SURCHARGED	
S6.003	SS68	0.269	0.000	0.16			5.7	SURCHARGED	
S1.018	SS25	0.421	0.000	0.34			5.2	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network 1 - Outfall 3

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 1 Number of Storage Structures 20 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.700 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.400 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 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.	Water Level (m)
S1.000	SS1	15 Winter	100	+40%					48.552
S1.001	SS2	15 Winter	100	+40%					48.423
S1.002	SS3	30 Winter	100	+40%	100/15 Summer				48.388
S2.000	SS4	15 Winter	100	+40%					48.723
S2.001	SS5	15 Winter	100	+40%					48.541
S1.003	SS6	60 Winter	100	+40%	100/15 Summer				48.366
S1.004	SS7	60 Winter	100	+40%	30/15 Summer				48.325
S1.005	SS8	60 Winter	100	+40%	30/15 Summer				48.277
S3.000	SS9	15 Winter	100	+40%	100/15 Summer				48.629
S4.000	SS10	15 Winter	100	+40%	100/15 Summer				48.603
S3.001	SS11	15 Winter	100	+40%	100/15 Summer				48.477
S1.006	SS12	120 Winter	100	+40%	1/15 Summer				48.033
S1.007	SS13	120 Winter	100	+40%	1/15 Summer				47.737
S1.008	SS14	240 Winter	100	+40%	1/15 Summer				47.418
S1.009	SS15	360 Winter	100	+40%	1/120 Winter				47.182
S1.010	SS16	360 Winter	100	+40%	30/60 Summer				46.950
S1.011	SS17	480 Winter	100	+40%	30/60 Summer				46.767
S1.012	SS18	480 Winter	100	+40%	30/60 Summer				46.631
S1.013	SS19	480 Winter	100	+40%	30/60 Summer				46.522
S1.014	SS20	480 Winter	100	+40%	30/120 Summer				46.380
S1.015	SS21	960 Winter	100	+40%	100/240 Summer				46.195
S1.016	SS22	960 Winter	100	+40%	100/240 Summer				46.011
S5.000	SS23	30 Winter	100	+40%					45.721
S1.017	SS24	960 Winter	100	+40%					45.639
S6.000	SS65	960 Winter	100	+40%	100/15 winter				44.782
S6.001	SS66	960 Winter	100	+40%	30/15 Summer				44.782
S7.000	SEX S1	15 Winter	100	+40%	30/15 Summer	100/15 Summer			47.001
S7.001	SEX S2	15 Winter	100	+40%					45.756
S6.002	SS67	960 Winter	100	+40%	1/15 Summer				44.784
S6.003	SS68	960 Winter	100	+40%	1/15 Summer				44.788
S1.018	SS25	960 Winter	100	+40%	1/15 Summer				44.792

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS1	-0.048	0.000	0.52		6	3.3	OK	
S1.001	SS2	-0.019	0.000	0.92		8	5.9	OK	
S1.002	SS3	0.105	0.000	0.78		17	5.0	SURCHARGED	
S2.000	SS4	-0.037	0.000	0.71		6	4.6	OK	
S2.001	SS5	-0.029	0.000	0.83		6	8.8	OK	
S1.003	SS6	0.235	0.000	0.92		38	8.2	SURCHARGED	
S1.004	SS7	0.427	0.000	0.91		45	5.7	SURCHARGED	
S1.005	SS8	0.502	0.000	0.90		55	12.2	SURCHARGED	
S3.000	SS9	0.629	0.000	0.86			15.9	FLOOD RISK	
S4.000	SS10	0.503	0.000	0.67			15.8	SURCHARGED	
S3.001	SS11	0.692	0.000	1.26			28.4	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Network 1 - Outfall 3

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.006	SS12	0.941	0.000	1.80		127	14.3	FLOOD RISK	
S1.007	SS13	0.795	0.000	1.55		126	11.4	FLOOD RISK	
S1.008	SS14	0.664	0.000	1.74		154	9.8	SURCHARGED	
S1.009	SS15	0.527	0.000	1.31		173	8.4	SURCHARGED	
S1.010	SS16	0.440	0.000	1.30		198	8.1	SURCHARGED	
S1.011	SS17	0.375	0.000	1.28			7.9	SURCHARGED	
S1.012	SS18	0.334	0.000	1.35			8.1	SURCHARGED	
S1.013	SS19	0.296	0.000	1.30			8.1	SURCHARGED	
S1.014	SS20	0.256	0.000	1.48			8.4	SURCHARGED	
S1.015	SS21	0.184	0.000	1.30			7.4	SURCHARGED	
S1.016	SS22	0.114	0.000	1.26			7.4	SURCHARGED	
S5.000	SS23	-0.032	0.000	0.80		24	4.3	OK	
S1.017	SS24	-0.059	0.000	0.35			8.0	OK	
S6.000	SS65	0.450	0.000	0.04			1.5	SURCHARGED	
S6.001	SS66	0.661	0.000	0.14		252	5.2	SURCHARGED	
S7.000	SEX S1	0.901	0.563	1.97			11.6	FLOOD	3
S7.001	SEX S2	-0.028	0.000	0.85			27.7	OK	
S6.002	SS67	0.741	0.000	0.14			5.2	SURCHARGED	
S6.003	SS68	0.851	0.000	0.14			5.2	SURCHARGED	
S1.018	SS25	1.015	0.000	0.34			5.2	SURCHARGED	