

Queensberry Design Ltd		Page 0
North East (Head Office)	AVANT HOMES	
5 Staithes, The Watermark	SOUTH TYNE COLLEGE	
Gateshead, NE11 9SN	SW_WEST_OUTFALL	
Date 09/08/2024 09:37	Designed by N DUNWOODIE	
File QD2117_SW_EAST 08 01 24...	Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	17.100	Add Flow / Climate Change (%)	0
Ratio R	0.348	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Surface Network 2

- Indicates pipe length does not match coordinates

« - 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
1.000	9.874	0.200	49.4	0.037	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	50.814	0.500	101.6	0.089	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	45.381	0.525	86.4	0.157	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	44.114	0.590	74.8	0.234	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	42.693	0.200	213.5	0.101	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	11.706	0.100	117.1	0.049	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	37.733	0.200	188.7	0.084	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	41.009	0.320	128.2	0.070	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	13.469	0.050	269.4	0.129	5.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	43.44	5.09	35.375	0.037	0.0	0.0	0.0	1.87	74.2	4.4
1.001	41.25	5.74	35.175	0.126	0.0	0.0	0.0	1.30	51.6	14.1
1.002	39.90	6.19	34.675	0.283	0.0	0.0	0.0	1.69	119.6	30.6
1.003	38.76	6.59	34.150	0.517	0.0	0.0	0.0	1.82	128.7	54.3
1.004	37.42	7.10	33.560	0.618	0.0	0.0	0.0	1.39	220.7	62.6
1.005	37.16	7.21	33.360	0.667	0.0	0.0	0.0	1.88	298.7	67.1
1.006	36.14	7.63	33.260	0.751	0.0	0.0	0.0	1.48	234.9	73.5
1.007	35.29	8.02	33.060	0.821	0.0	0.0	0.0	1.79	285.4	78.5
2.000	43.11	5.18	32.790	0.129	0.0	0.0	0.0	1.23	196.2	15.1

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Network Design Table for Surface Network 2

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
1.008	10.203	0.100	102.0	0.021	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴
1.009	39.253	0.450	87.2	0.027	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴
1.010	21.252	0.100	212.5	0.145	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴
1.011	13.527	0.065	208.1	0.032	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴
1.012	15.000#	0.050	300.0	0.094	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴
3.000	17.096	0.300	57.0	0.097	5.00	0.0	0.600	o	225	Pipe/Conduit	🔴
3.001	58.968	1.545	38.2	0.122	0.00	0.0	0.600	o	300	Pipe/Conduit	🔴
4.000	50.751	0.440	115.3	0.183	5.00	0.0	0.600	o	300	Pipe/Conduit	🔴
4.001	8.565	0.100	85.7	0.038	0.00	0.0	0.600	o	300	Pipe/Conduit	🔴
5.000	13.240	0.200	66.2	0.049	5.00	0.0	0.600	o	225	Pipe/Conduit	🔴
5.001	45.190	0.665	68.0	0.097	0.00	0.0	0.600	o	225	Pipe/Conduit	🔴
3.002	32.635	0.220	148.3	0.162	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴
3.003	45.293	0.540	83.9	0.122	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴
6.000	16.516	1.130	14.6	0.079	5.00	0.0	0.600	o	225	Pipe/Conduit	🔴
3.004	27.564	0.270	102.1	0.062	0.00	0.0	0.600	o	450	Pipe/Conduit	🔴

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.008	35.11	8.10	32.740	0.971	0.0	0.0	0.0	2.01	320.1	92.3
1.009	34.47	8.40	32.640	0.998	0.0	0.0	0.0	2.18	346.4	93.2
1.010	33.95	8.66	32.190	1.143	0.0	0.0	0.0	1.39	221.2	105.1
1.011	33.64	8.82	32.090	1.175	0.0	0.0	0.0	1.41	223.5	107.0
1.012	33.23	9.03	32.025	1.269	0.0	0.0	0.0	1.17	185.8	114.2
3.000	43.17	5.16	35.180	0.097	0.0	0.0	0.0	1.74	69.0	11.3
3.001	41.87	5.55	34.805	0.219	0.0	0.0	0.0	2.55	180.5	24.8
4.000	41.77	5.58	33.800	0.183	0.0	0.0	0.0	1.46	103.4	20.7
4.001	41.50	5.66	33.360	0.221	0.0	0.0	0.0	1.70	120.2	24.8
5.000	43.26	5.14	34.200	0.049	0.0	0.0	0.0	1.61	64.0	5.7
5.001	41.66	5.61	34.000	0.146	0.0	0.0	0.0	1.59	63.2	16.5
3.002	40.49	5.99	33.110	0.748	0.0	0.0	0.0	1.67	265.1	82.0
3.003	39.49	6.33	32.890	0.870	0.0	0.0	0.0	2.22	353.3	93.1
6.000	43.47	5.08	33.705	0.079	0.0	0.0	0.0	3.44	136.8	9.3
3.004	38.86	6.56	32.350	1.011	0.0	0.0	0.0	2.01	320.0	106.4

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Network Design Table for Surface Network 2

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
3.005	21.000#	0.075	280.0	0.096	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.013	7.389	0.300	24.6	0.054	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.014	8.049	0.370	21.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.015	8.293	0.060	138.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.005	38.08	6.85	32.080	1.107	0.0	0.0	0.0	1.21	192.4	114.2
1.013	33.17	9.06	31.850	2.430	0.0	0.0	0.0	4.11	653.6	218.3
1.014	33.08	9.11	31.550	2.430	0.0	0.0	0.0	2.82	112.0x	218.3
1.015	32.85	9.23	31.180	2.430	0.0	0.0	0.0	1.11	44.1x	218.3

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PIPELINE SCHEDULES for Surface Network 2

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	S1	36.811	35.375	1.211	Open Manhole	1350
1.001	o	225	S2	36.887	35.175	1.487	Open Manhole	1500
1.002	o	300	S3	37.068	34.675	2.093	Open Manhole	1500
1.003	o	300	S4	36.164	34.150	1.714	Open Manhole	1500
1.004	o	450	S5	36.205	33.560	2.195	Open Manhole	1500
1.005	o	450	S6	35.489	33.360	1.679	Open Manhole	1500
1.006	o	450	S7	35.234	33.260	1.524	Open Manhole	1500
1.007	o	450	S8	35.017	33.060	1.507	Open Manhole	1500
2.000	o	450	S9	34.558	32.790	1.318	Open Manhole	1500
1.008	o	450	S10	34.744	32.740	1.554	Open Manhole	1500
1.009	o	450	S11	34.638	32.640	1.548	Open Manhole	1500
1.010	o	450	S12	34.004	32.190	1.364	Open Manhole	1500
1.011	o	450	S13	33.979	32.090	1.439	Open Manhole	1500
1.012	o	450	S14	34.153	32.025	1.678	Open Manhole	1500
3.000	o	225	S15	36.613	35.180	1.208	Open Manhole	1350
3.001	o	300	S16	36.520	34.805	1.415	Open Manhole	1500

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)
1.000	9.874	49.4	S2	36.887	35.175	1.487	Open Manhole	1500
1.001	50.814	101.6	S3	37.068	34.675	2.168	Open Manhole	1500
1.002	45.381	86.4	S4	36.164	34.150	1.714	Open Manhole	1500
1.003	44.114	74.8	S5	36.205	33.560	2.345	Open Manhole	1500
1.004	42.693	213.5	S6	35.489	33.360	1.679	Open Manhole	1500
1.005	11.706	117.1	S7	35.234	33.260	1.524	Open Manhole	1500
1.006	37.733	188.7	S8	35.017	33.060	1.507	Open Manhole	1500
1.007	41.009	128.2	S10	34.744	32.740	1.554	Open Manhole	1500
2.000	13.469	269.4	S10	34.744	32.740	1.554	Open Manhole	1500
1.008	10.203	102.0	S11	34.638	32.640	1.548	Open Manhole	1500
1.009	39.253	87.2	S12	34.004	32.190	1.364	Open Manhole	1500
1.010	21.252	212.5	S13	33.979	32.090	1.439	Open Manhole	1500
1.011	13.527	208.1	S14	34.153	32.025	1.678	Open Manhole	1500
1.012	15.000#	300.0	S26_BASIN	33.400	31.975	0.975	Open Manhole	1500
3.000	17.096	57.0	S16	36.520	34.880	1.415	Open Manhole	1500
3.001	58.968	38.2	S21	35.917	33.260	2.357	Open Manhole	1800

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PIPELINE SCHEDULES for Surface Network 2

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)
4.000	o	300	S17	35.540	33.800	1.440	Open Manhole	1200
4.001	o	300	S18	35.920	33.360	2.260	Open Manhole	1200
5.000	o	225	S19	35.675	34.200	1.250	Open Manhole	1350
5.001	o	225	S20	35.850	34.000	1.625	Open Manhole	1200
3.002	o	450	S21	35.917	33.110	2.357	Open Manhole	1800
3.003	o	450	S22	35.512	32.890	2.172	Open Manhole	1500
6.000	o	225	S23	35.065	33.705	1.135	Open Manhole	1350
3.004	o	450	S24	35.069	32.350	2.269	Open Manhole	1500
3.005	o	450	S25	34.717	32.080	2.187	Open Manhole	1500
1.013	o	450	S26_BASIN	33.400	31.850	1.100	Open Manhole	1500
1.014	o	225	S27_FC	33.650	31.550	1.875	Open Manhole	2400
1.015	o	225	C1	33.882	31.180	2.477	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.000	50.751	115.3	S18	35.920	33.360	2.260	Open Manhole	1200
4.001	8.565	85.7	S21	35.917	33.260	2.357	Open Manhole	1800
5.000	13.240	66.2	S20	35.850	34.000	1.625	Open Manhole	1200
5.001	45.190	68.0	S21	35.917	33.335	2.357	Open Manhole	1800
3.002	32.635	148.3	S22	35.512	32.890	2.172	Open Manhole	1500
3.003	45.293	83.9	S24	35.069	32.350	2.269	Open Manhole	1500
6.000	16.516	14.6	S24	35.069	32.575	2.269	Open Manhole	1500
3.004	27.564	102.1	S25	34.717	32.080	2.187	Open Manhole	1500
3.005	21.000#	280.0	S26_BASIN	33.400	32.005	0.945	Open Manhole	1500
1.013	7.389	24.6	S27_FC	33.650	31.550	1.650	Open Manhole	2400
1.014	8.049	21.8	C1	33.882	31.180	2.477	Open Manhole	1200
1.015	8.293	138.2	4802	33.770	31.120	2.425	Open Manhole	0

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Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: S27 FC, DS/PN: 1.014, Volume (m³): 10.4

Unit Reference	MD-SHE-0125-8500-1700-8500
Design Head (m)	1.700
Design Flow (l/s)	8.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	125
Invert Level (m)	31.550
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	8.5
Flush-Flo™	0.500	8.5
Kick-Flo®	1.033	6.7
Mean Flow over Head Range	-	7.4

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.5	1.200	7.2	3.000	11.1	7.000	16.6
0.200	7.4	1.400	7.8	3.500	12.0	7.500	17.2
0.300	8.1	1.600	8.3	4.000	12.7	8.000	17.7
0.400	8.4	1.800	8.7	4.500	13.5	8.500	18.3
0.500	8.5	2.000	9.2	5.000	14.2	9.000	18.8
0.600	8.4	2.200	9.6	5.500	14.8	9.500	19.3
0.800	8.1	2.400	10.0	6.000	15.5		
1.000	7.0	2.600	10.4	6.500	16.1		

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<u>Storage Structures for Surface Network 2</u> <u>Tank or Pond Manhole: S26 BASIN, DS/PN: 1.013</u> Invert Level (m) 31.850 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>921.0</td><td>1.550</td><td>2143.1</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	921.0	1.550	2143.1
Depth (m)	Area (m²)	Depth (m)	Area (m²)							
0.000	921.0	1.550	2143.1							
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 2

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		Exceeded
1.000	S1	35.413	-0.187	0.000	0.07			4.2	OK	
1.001	S2	35.253	-0.147	0.000	0.25			12.5	OK	
1.002	S3	34.775	-0.200	0.000	0.24			27.1	OK	
1.003	S4	34.283	-0.167	0.000	0.40			48.5	OK	1
1.004	S5	33.726	-0.284	0.000	0.29			57.4	OK	
1.005	S6	33.542	-0.268	0.000	0.34			61.4	OK	
1.006	S7	33.438	-0.272	0.000	0.33			67.9	OK	
1.007	S8	33.225	-0.285	0.000	0.29			73.0	OK	
2.000	S9	32.959	-0.281	0.000	0.09			13.5	OK	
1.008	S10	32.956	-0.234	0.000	0.47			83.2	OK	
1.009	S11	32.801	-0.289	0.000	0.28			84.8	OK	
1.010	S12	32.425	-0.215	0.000	0.53			94.9	OK	
1.011	S13	32.348	-0.192	0.000	0.58			96.3	OK	
1.012	S14	32.309	-0.166	0.000	0.71			101.7	OK	
3.000	S15	35.244	-0.161	0.000	0.18			10.9	OK	
3.001	S16	34.878	-0.227	0.000	0.13			22.6	OK	
4.000	S17	33.894	-0.206	0.000	0.21			20.2	OK	
4.001	S18	33.473	-0.187	0.000	0.30			23.9	OK	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.000	S19	15 Winter	1	+0%	100/15 Summer			
5.001	S20	15 Winter	1	+0%	30/15 Summer			
3.002	S21	15 Winter	1	+0%	30/15 Summer			
3.003	S22	15 Winter	1	+0%	30/15 Summer			
6.000	S23	15 Winter	1	+0%				
3.004	S24	15 Winter	1	+0%	30/15 Summer			
3.005	S25	15 Winter	1	+0%	30/15 Summer			
1.013	S26_BASIN	480 Winter	1	+0%	30/30 Summer			
1.014	S27_FC	480 Winter	1	+0%	1/15 Summer			
1.015	C1	30 Summer	1	+0%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.000	S19	34.248	-0.177	0.000	0.10			5.5	OK
5.001	S20	34.076	-0.149	0.000	0.25			14.8	OK
3.002	S21	33.289	-0.271	0.000	0.33			76.3	OK
3.003	S22	33.050	-0.290	0.000	0.27			86.6	OK
6.000	S23	33.745	-0.185	0.000	0.07			8.9	OK
3.004	S24	32.540	-0.260	0.000	0.37			100.5	OK
3.005	S25	32.355	-0.175	0.000	0.69			108.2	OK
1.013	S26_BASIN	32.111	-0.189	0.000	0.03			10.7	OK
1.014	S27_FC	32.116	0.341	0.000	0.10			8.5	SURCHARGED
1.015	C1	31.255	-0.150	0.000	0.25			8.5	OK

PN	US/MH Name	Level Exceeded
5.000	S19	
5.001	S20	
3.002	S21	
3.003	S22	
6.000	S23	
3.004	S24	
3.005	S25	
1.013	S26_BASIN	
1.014	S27_FC	
1.015	C1	

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North East (Head Office)	AVANT HOMES	
5 Staithes, The Watermark	SOUTH TYNE COLLEGE	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 2

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /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 Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.348
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	17,100	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, 45, 45

US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.
1.000	S1	15 Winter	30	+45%	30/15 Summer			
1.001	S2	15 Winter	30	+45%	30/15 Summer			
1.002	S3	15 Winter	30	+45%	30/15 Summer			
1.003	S4	15 Winter	30	+45%	30/15 Summer	100/15 Winter		
1.004	S5	15 Winter	30	+45%	30/15 Summer			
1.005	S6	15 Winter	30	+45%	30/15 Summer			
1.006	S7	15 Winter	30	+45%	30/15 Summer			
1.007	S8	15 Winter	30	+45%	30/15 Summer			
2.000	S9	15 Winter	30	+45%	30/15 Summer			
1.008	S10	15 Winter	30	+45%	30/15 Summer			
1.009	S11	15 Winter	30	+45%	30/15 Summer			
1.010	S12	15 Winter	30	+45%	30/15 Summer			
1.011	S13	15 Winter	30	+45%	30/15 Summer			
1.012	S14	960 Winter	30	+45%	30/15 Summer			
3.000	S15	15 Winter	30	+45%				
3.001	S16	15 Winter	30	+45%				
4.000	S17	15 Winter	30	+45%	30/15 Winter			
4.001	S18	15 Winter	30	+45%	30/15 Summer			

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North East (Head Office)	AVANT HOMES	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 2

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S1	35.781	0.181	0.000	0.23		14.3	SURCHARGED
1.001	S2	35.768	0.368	0.000	0.84		41.7	SURCHARGED
1.002	S3	35.504	0.529	0.000	0.76		85.2	SURCHARGED
1.003	S4	35.195	0.745	0.000	1.35		162.6	SURCHARGED
1.004	S5	34.309	0.299	0.000	0.93		183.2	SURCHARGED
1.005	S6	34.163	0.353	0.000	1.00		178.1	SURCHARGED
1.006	S7	34.058	0.348	0.000	0.97		201.2	SURCHARGED
1.007	S8	33.880	0.370	0.000	0.81		207.0	SURCHARGED
2.000	S9	33.679	0.439	0.000	0.30		44.1	SURCHARGED
1.008	S10	33.668	0.478	0.000	1.36		243.0	SURCHARGED
1.009	S11	33.481	0.391	0.000	0.81		247.5	SURCHARGED
1.010	S12	33.192	0.552	0.000	1.55		275.5	SURCHARGED
1.011	S13	32.948	0.408	0.000	1.69		281.9	SURCHARGED
1.012	S14	32.834	0.359	0.000	0.27		38.7	SURCHARGED
3.000	S15	35.311	-0.094	0.000	0.63		38.7	OK
3.001	S16	34.961	-0.144	0.000	0.52		89.8	OK
4.000	S17	34.177	0.077	0.000	0.71		69.4	SURCHARGED
4.001	S18	34.006	0.346	0.000	0.95		74.9	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S1	
1.001	S2	
1.002	S3	
1.003	S4	1
1.004	S5	
1.005	S6	
1.006	S7	
1.007	S8	
2.000	S9	
1.008	S10	
1.009	S11	
1.010	S12	
1.011	S13	
1.012	S14	
3.000	S15	
3.001	S16	
4.000	S17	
4.001	S18	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S1	36.808	1.208	0.000	0.29		17.6	FLOOD RISK
1.001	S2	36.792	1.392	0.000	0.92		45.7	FLOOD RISK
1.002	S3	36.489	1.514	0.000	0.80		89.9	SURCHARGED
1.003	S4	36.164	1.714	0.385	1.47		177.2	FLOOD
1.004	S5	35.143	1.133	0.000	1.01		199.4	SURCHARGED
1.005	S6	34.954	1.144	0.000	1.18		210.6	SURCHARGED
1.006	S7	34.818	1.108	0.000	1.11		230.1	SURCHARGED
1.007	S8	34.569	1.059	0.000	0.98		248.1	SURCHARGED
2.000	S9	34.276	1.036	0.000	0.34		50.3	FLOOD RISK
1.008	S10	34.262	1.072	0.000	1.65		294.0	SURCHARGED
1.009	S11	33.988	0.898	0.000	0.97		299.2	SURCHARGED
1.010	S12	33.566	0.926	0.000	1.88		334.5	SURCHARGED
1.011	S13	33.208	0.668	0.000	2.05		342.5	SURCHARGED
1.012	S14	33.087	0.612	0.000	0.25		35.3	SURCHARGED
3.000	S15	35.336	-0.069	0.000	0.81		49.9	OK
3.001	S16	35.086	-0.019	0.000	0.67		115.0	OK
4.000	S17	34.996	0.896	0.000	0.77		75.3	SURCHARGED
4.001	S18	34.724	1.064	0.000	1.15		91.0	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S1	
1.001	S2	
1.002	S3	
1.003	S4	1
1.004	S5	
1.005	S6	
1.006	S7	
1.007	S8	
2.000	S9	
1.008	S10	
1.009	S11	
1.010	S12	
1.011	S13	
1.012	S14	
3.000	S15	
3.001	S16	
4.000	S17	
4.001	S18	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.000	S19	15 Winter	100	+45%	100/15 Summer			
5.001	S20	15 Winter	100	+45%	30/15 Summer			
3.002	S21	15 Winter	100	+45%	30/15 Summer			
3.003	S22	15 Winter	100	+45%	30/15 Summer			
6.000	S23	15 Winter	100	+45%				
3.004	S24	15 Winter	100	+45%	30/15 Summer			
3.005	S25	1440 Winter	100	+45%	30/15 Summer			
1.013	S26_BASIN	1440 Winter	100	+45%	30/30 Summer			
1.014	S27_FC	1440 Winter	100	+45%	1/15 Summer			
1.015	C1	360 Summer	100	+45%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.000	S19	35.127	0.702	0.000	0.44			24.3	SURCHARGED
5.001	S20	35.096	0.871	0.000	0.95			57.4	SURCHARGED
3.002	S21	34.605	1.045	0.000	1.28			295.5	SURCHARGED
3.003	S22	34.249	0.909	0.000	1.07			339.6	SURCHARGED
6.000	S23	33.795	-0.135	0.000	0.34			40.7	OK
3.004	S24	33.624	0.824	0.000	1.46			397.3	SURCHARGED
3.005	S25	33.087	0.557	0.000	0.20			31.0	SURCHARGED
1.013	S26_BASIN	33.086	0.786	0.000	0.04			11.9	SURCHARGED
1.014	S27_FC	33.092	1.317	0.000	0.10			8.5	SURCHARGED
1.015	C1	31.255	-0.150	0.000	0.25			8.5	OK

PN	US/MH Name	Level Exceeded
5.000	S19	
5.001	S20	
3.002	S21	
3.003	S22	
6.000	S23	
3.004	S24	
3.005	S25	
1.013	S26_BASIN	
1.014	S27_FC	
1.015	C1	