

Odyssey Markides LLP						Page 17
Tuscany House White Hart Lane Basingstoke RG21 4AF			Designed by BASPC1 Checked by Innovyze Network 2020.1			
Date 26/08/2021 18:46 File 2021-08-17 Network - NA...						
<u>Manhole Schedules for Storm</u>						
MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
72	497499.497	102777.873	497499.497	102777.873	Required	
73	497485.161	102764.356	497485.161	102764.356	Required	
BASIN 3	497507.441	102755.325	497507.441	102755.325	Required	
75	497531.441	102728.920	497531.441	102728.920	Required	
76	497563.681	102703.971	497563.681	102703.971	Required	
77	497568.638	102700.133	497568.638	102700.133	Required	
78	497562.977	102684.340	497562.977	102684.340	Required	
TANK	497534.313	102686.411	497534.313	102686.411	Required	
80	497534.893	102680.574	497534.893	102680.574	Required	
BASIN 4	497512.163	102676.808	497512.163	102676.808	Required	
82	497503.313	102664.439	497503.313	102664.439	Required	
83	497780.981	102515.024	497780.981	102515.024	Required	
84	497777.928	102565.356	497777.928	102565.356	Required	
85	497761.977	102533.663	497761.977	102533.663	Required	
86	497756.347	102527.881	497756.347	102527.881	Required	
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<u>Manhole Schedules for Storm</u> <table><thead><tr><th>MH Name</th><th>Manhole Easting (m)</th><th>Manhole Northing (m)</th><th>Intersection Easting (m)</th><th>Intersection Northing (m)</th><th>Manhole Access</th><th>Layout (North)</th></tr></thead><tbody><tr><td>87</td><td>497707.687</td><td>102553.975</td><td>497707.687</td><td>102553.975</td><td>Required</td><td></td></tr><tr><td>88</td><td>497722.976</td><td>102587.848</td><td>497722.976</td><td>102587.848</td><td>Required</td><td></td></tr><tr><td>89</td><td>497707.265</td><td>102564.576</td><td>497707.265</td><td>102564.576</td><td>Required</td><td></td></tr><tr><td>90</td><td>497699.641</td><td>102560.796</td><td>497699.641</td><td>102560.796</td><td>Required</td><td></td></tr><tr><td>91</td><td>497684.627</td><td>102624.319</td><td>497684.627</td><td>102624.319</td><td>Required</td><td></td></tr><tr><td>92</td><td>497673.090</td><td>102606.543</td><td>497673.090</td><td>102606.543</td><td>Required</td><td></td></tr><tr><td>93</td><td>497665.797</td><td>102600.504</td><td>497665.797</td><td>102600.504</td><td>Required</td><td></td></tr><tr><td>94</td><td>497653.393</td><td>102611.458</td><td>497653.393</td><td>102611.458</td><td>Required</td><td></td></tr><tr><td>95</td><td>497609.405</td><td>102633.387</td><td>497609.405</td><td>102633.387</td><td>Required</td><td></td></tr><tr><td>96</td><td>497585.202</td><td>102646.535</td><td>497585.202</td><td>102646.535</td><td>Required</td><td></td></tr><tr><td>BASIN 5</td><td>497573.800</td><td>102631.702</td><td>497573.800</td><td>102631.702</td><td>Required</td><td></td></tr><tr><td>98</td><td>497554.454</td><td>102636.894</td><td>497554.454</td><td>102636.894</td><td>Required</td><td></td></tr><tr><td></td><td>497549.020</td><td>102627.742</td><td></td><td></td><td>No Entry</td><td></td></tr></tbody></table>							MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)	87	497707.687	102553.975	497707.687	102553.975	Required		88	497722.976	102587.848	497722.976	102587.848	Required		89	497707.265	102564.576	497707.265	102564.576	Required		90	497699.641	102560.796	497699.641	102560.796	Required		91	497684.627	102624.319	497684.627	102624.319	Required		92	497673.090	102606.543	497673.090	102606.543	Required		93	497665.797	102600.504	497665.797	102600.504	Required		94	497653.393	102611.458	497653.393	102611.458	Required		95	497609.405	102633.387	497609.405	102633.387	Required		96	497585.202	102646.535	497585.202	102646.535	Required		BASIN 5	497573.800	102631.702	497573.800	102631.702	Required		98	497554.454	102636.894	497554.454	102636.894	Required			497549.020	102627.742			No Entry	
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<u>PIPELINE SCHEDULES for Storm</u> <u>Upstream Manhole</u> <table><tr><th>PN</th><th>Hyd Sect</th><th>Diam (mm)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>1.000</td><td>o</td><td>300</td><td>1</td><td>6.969</td><td>5.469</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>2.000</td><td>o</td><td>375</td><td>2</td><td>6.660</td><td>5.385</td><td>0.900</td><td>Open Manhole</td><td>1350</td></tr><tr><td>2.001</td><td>o</td><td>375</td><td>3</td><td>6.850</td><td>5.275</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.001</td><td>o</td><td>375</td><td>4</td><td>6.929</td><td>5.212</td><td>1.342</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.002</td><td>o</td><td>375</td><td>5</td><td>6.846</td><td>5.162</td><td>1.309</td><td>Open Manhole</td><td>1350</td></tr><tr><td>3.000</td><td>o</td><td>375</td><td>6</td><td>6.906</td><td>5.331</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>3.001</td><td>o</td><td>375</td><td>7</td><td>6.685</td><td>5.110</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.003</td><td>o</td><td>450</td><td>8</td><td>6.563</td><td>4.913</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.004</td><td>o</td><td>450</td><td>9</td><td>6.314</td><td>4.838</td><td>1.026</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.005</td><td>o</td><td>450</td><td>10</td><td>6.051</td><td>4.701</td><td>0.900</td><td>Open Manhole</td><td>1350</td></tr><tr><td>4.000</td><td>o</td><td>375</td><td>11</td><td>6.307</td><td>4.732</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.006</td><td>o</td><td>600</td><td>12</td><td>5.984</td><td>4.435</td><td>0.949</td><td>Open Manhole</td><td>1500</td></tr><tr><td>5.000</td><td>o</td><td>300</td><td>13</td><td>7.000</td><td>5.800</td><td>0.900</td><td>Open Manhole</td><td>1200</td></tr><tr><td>5.001</td><td>o</td><td>300</td><td>14</td><td>7.250</td><td>5.627</td><td>1.323</td><td>Open Manhole</td><td>1200</td></tr></table> <u>Downstream Manhole</u> <table><tr><th>PN</th><th>Length (m)</th><th>Slope (1:X)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>1.000</td><td>29.623</td><td>162.8</td><td>4</td><td>6.929</td><td>5.287</td><td>1.342</td><td>Open Manhole</td><td>1350</td></tr><tr><td>2.000</td><td>26.224</td><td>238.4</td><td>3</td><td>6.850</td><td>5.275</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>2.001</td><td>15.003</td><td>238.1</td><td>4</td><td>6.929</td><td>5.212</td><td>1.342</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.001</td><td>15.735</td><td>313.0</td><td>5</td><td>6.846</td><td>5.162</td><td>1.309</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.002</td><td>34.637</td><td>199.1</td><td>8</td><td>6.563</td><td>4.988</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>3.000</td><td>22.261</td><td>100.7</td><td>7</td><td>6.685</td><td>5.110</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>3.001</td><td>8.782</td><td>72.0</td><td>8</td><td>6.563</td><td>4.988</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.003</td><td>28.730</td><td>383.1</td><td>9</td><td>6.314</td><td>4.838</td><td>1.026</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.004</td><td>27.193</td><td>198.5</td><td>10</td><td>6.051</td><td>4.701</td><td>0.900</td><td>Open Manhole</td><td>1350</td></tr><tr><td>1.005</td><td>16.213</td><td>139.8</td><td>12</td><td>5.984</td><td>4.585</td><td>0.949</td><td>Open Manhole</td><td>1500</td></tr><tr><td>4.000</td><td>22.527</td><td>312.9</td><td>12</td><td>5.984</td><td>4.660</td><td>0.949</td><td>Open Manhole</td><td>1500</td></tr><tr><td>1.006</td><td>108.735</td><td>464.7</td><td>BASIN 1</td><td>5.900</td><td>4.201</td><td>1.099</td><td>Open Manhole</td><td>1500</td></tr><tr><td>5.000</td><td>34.516</td><td>199.5</td><td>14</td><td>7.250</td><td>5.627</td><td>1.323</td><td>Open Manhole</td><td>1200</td></tr><tr><td>5.001</td><td>11.951</td><td>239.0</td><td>15</td><td>7.066</td><td>5.577</td><td>1.189</td><td>Open Manhole</td><td>1200</td></tr></table>										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	300	1	6.969	5.469	1.200	Open Manhole	1200	2.000	o	375	2	6.660	5.385	0.900	Open Manhole	1350	2.001	o	375	3	6.850	5.275	1.200	Open Manhole	1350	1.001	o	375	4	6.929	5.212	1.342	Open Manhole	1350	1.002	o	375	5	6.846	5.162	1.309	Open Manhole	1350	3.000	o	375	6	6.906	5.331	1.200	Open Manhole	1350	3.001	o	375	7	6.685	5.110	1.200	Open Manhole	1350	1.003	o	450	8	6.563	4.913	1.200	Open Manhole	1350	1.004	o	450	9	6.314	4.838	1.026	Open Manhole	1350	1.005	o	450	10	6.051	4.701	0.900	Open Manhole	1350	4.000	o	375	11	6.307	4.732	1.200	Open Manhole	1350	1.006	o	600	12	5.984	4.435	0.949	Open Manhole	1500	5.000	o	300	13	7.000	5.800	0.900	Open Manhole	1200	5.001	o	300	14	7.250	5.627	1.323	Open Manhole	1200	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	29.623	162.8	4	6.929	5.287	1.342	Open Manhole	1350	2.000	26.224	238.4	3	6.850	5.275	1.200	Open Manhole	1350	2.001	15.003	238.1	4	6.929	5.212	1.342	Open Manhole	1350	1.001	15.735	313.0	5	6.846	5.162	1.309	Open Manhole	1350	1.002	34.637	199.1	8	6.563	4.988	1.200	Open Manhole	1350	3.000	22.261	100.7	7	6.685	5.110	1.200	Open Manhole	1350	3.001	8.782	72.0	8	6.563	4.988	1.200	Open Manhole	1350	1.003	28.730	383.1	9	6.314	4.838	1.026	Open Manhole	1350	1.004	27.193	198.5	10	6.051	4.701	0.900	Open Manhole	1350	1.005	16.213	139.8	12	5.984	4.585	0.949	Open Manhole	1500	4.000	22.527	312.9	12	5.984	4.660	0.949	Open Manhole	1500	1.006	108.735	464.7	BASIN 1	5.900	4.201	1.099	Open Manhole	1500	5.000	34.516	199.5	14	7.250	5.627	1.323	Open Manhole	1200	5.001	11.951	239.0	15	7.066	5.577	1.189	Open Manhole	1200
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)																																																																																																																																																																																																																																																																															
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2.000	o	375	2	6.660	5.385	0.900	Open Manhole	1350																																																																																																																																																																																																																																																																															
2.001	o	375	3	6.850	5.275	1.200	Open Manhole	1350																																																																																																																																																																																																																																																																															
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2.000	26.224	238.4	3	6.850	5.275	1.200	Open Manhole	1350																																																																																																																																																																																																																																																																															
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4.000	22.527	312.9	12	5.984	4.660	0.949	Open Manhole	1500																																																																																																																																																																																																																																																																															
1.006	108.735	464.7	BASIN 1	5.900	4.201	1.099	Open Manhole	1500																																																																																																																																																																																																																																																																															
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Innovyze	Network 2020.1	

PIPELINE SCHEDULES for Storm

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)
5.002	o	300	15	7.066	5.577	1.189	Open Manhole	1200
5.003	o	375	16	6.762	5.321	1.066	Open Manhole	1350
6.000	o	300	17	6.700	5.500	0.900	Open Manhole	1200
6.001	o	300	18	6.800	5.300	1.200	Open Manhole	1200
6.002	o	300	19	6.750	5.250	1.200	Open Manhole	1200
5.004	o	450	20	6.567	5.073	1.044	Open Manhole	1350
5.005	o	450	21	6.374	5.005	0.919	Open Manhole	1350
7.000	o	375	22	6.750	5.475	0.900	Open Manhole	1350
7.001	o	375	23	6.400	5.120	0.905	Open Manhole	1350
5.006	o	525	24	6.155	4.711	0.919	Open Manhole	1500
5.007	o	525	25	6.005	4.561	0.919	Open Manhole	1500
8.000	o	150	26	5.872	4.822	0.900	Open Manhole	1200
5.008	o	525	27	5.834	4.390	0.919	Open Manhole	1500
9.000	o	225	28	5.952	4.727	1.000	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)
5.002	42.967	237.4	16	6.762	5.396	1.066	Open Manhole	1350
5.003	19.007	109.9	20	6.567	5.148	1.044	Open Manhole	1350
6.000	42.648	213.2	18	6.800	5.300	1.200	Open Manhole	1200
6.001	6.210	124.2	19	6.750	5.250	1.200	Open Manhole	1200
6.002	6.407	237.3	20	6.567	5.223	1.044	Open Manhole	1350
5.004	26.102	385.0	21	6.374	5.005	0.919	Open Manhole	1350
5.005	27.205	124.0	24	6.155	4.786	0.919	Open Manhole	1500
7.000	39.044	110.0	23	6.400	5.120	0.905	Open Manhole	1350
7.001	9.832	38.0	24	6.155	4.861	0.919	Open Manhole	1500
5.006	24.581	163.9	25	6.005	4.561	0.919	Open Manhole	1500
5.007	21.692	126.9	27	5.834	4.390	0.919	Open Manhole	1500
8.000	14.072	246.9	27	5.834	4.765	0.919	Open Manhole	1500
5.008	14.285	238.1	29	5.755	4.330	0.900	Open Manhole	1500
9.000	15.131	156.0	29	5.755	4.630	0.900	Open Manhole	1500

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Innovyze				Network 2020.1					
<u>PIPELINE SCHEDULES for Storm</u>									
<u>Upstream Manhole</u>									
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	
5.009	o	525	29	5.755	4.330	0.900	Open Manhole		1500
10.000	o	300	30	6.777	5.277	1.200	Open Manhole		1200
10.001	o	375	31	6.674	5.099	1.200	Open Manhole		1350
10.002	o	375	32	7.054	4.984	1.695	Open Manhole		1350
10.003	o	375	33	6.721	4.877	1.469	Open Manhole		1350
10.004	o	375	34	6.362	4.777	1.210	Open Manhole		1350
10.005	o	375	35	6.198	4.623	1.200	Open Manhole		1350
10.006	o	375	36	6.237	4.569	1.293	Open Manhole		1350
1.007	o	450	BASIN 1	5.900	4.201	1.249	Open Manhole		1500
1.008	o	450	38	6.242	4.133	1.659	Open Manhole		1350
1.009	o	450	39	6.472	4.119	1.903	Open Manhole		1350
1.010	o	450	40	6.318	4.009	1.859	Open Manhole		1350
1.011	o	450	41	6.174	3.972	1.752	Open Manhole		1350
1.012	o	450	42	6.077	3.948	1.679	Open Manhole		1350
1.013	o	450	43	5.967	3.918	1.599	Open Manhole		1350
11.000	o	300	44	5.250	4.050	0.900	Open Manhole		1200
11.001	o	300	45	5.750	3.825	1.625	Open Manhole		1200
<u>Downstream Manhole</u>									
PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	
5.009	22.656	175.6	BASIN 1	5.900	4.201	1.174	Open Manhole		1500
10.000	10.994	107.0	31	6.674	5.174	1.200	Open Manhole		1350
10.001	36.167	313.0	32	7.054	4.984	1.695	Open Manhole		1350
10.002	33.536	313.0	33	6.721	4.877	1.469	Open Manhole		1350
10.003	31.399	314.0	34	6.362	4.777	1.210	Open Manhole		1350
10.004	16.139	105.0	35	6.198	4.623	1.200	Open Manhole		1350
10.005	16.741	313.0	36	6.237	4.569	1.293	Open Manhole		1350
10.006	38.524	104.7	BASIN 1	5.900	4.201	1.324	Open Manhole		1500
1.007	35.029	515.1	38	6.242	4.133	1.659	Open Manhole		1350
1.008	5.284	377.4	39	6.472	4.119	1.903	Open Manhole		1350
1.009	42.278	384.3	40	6.318	4.009	1.859	Open Manhole		1350
1.010	14.131	381.9	41	6.174	3.972	1.752	Open Manhole		1350
1.011	9.197	383.2	42	6.077	3.948	1.679	Open Manhole		1350
1.012	11.526	384.2	43	5.967	3.918	1.599	Open Manhole		1350
1.013	32.608	111.7	46	5.687	3.626	1.611	Open Manhole		1350
11.000	38.334	170.0	45	5.750	3.825	1.625	Open Manhole		1200
11.001	7.265	148.3	46	5.687	3.776	1.611	Open Manhole		1350
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Innovyze				Network 2020.1					
<u>PIPELINE SCHEDULES for Storm</u> <u>Upstream Manhole</u>									
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.014	o	450	46	5.687	3.626	1.611	Open Manhole		1350
1.015	o	450	47	5.372	3.549	1.373	Open Manhole		1350
12.000	o	225	48	7.030	5.805	1.000	Open Manhole		1200
13.000	o	300	49	7.345	5.845	1.200	Open Manhole		1200
13.001	o	300	50	7.220	5.720	1.200	Open Manhole		1200
13.002	o	300	51	7.140	5.640	1.200	Open Manhole		1200
12.001	o	300	52	6.850	5.516	1.034	Open Manhole		1200
12.002	o	300	53	6.650	5.417	0.933	Open Manhole		1200
12.003	o	375	54	6.850	5.272	1.203	Open Manhole		1350
12.004	o	450	55	6.400	5.140	0.810	Open Manhole		1350
14.000	o	300	56	6.400	5.200	0.900	Open Manhole		1200
12.005	o	450	57	6.232	5.016	0.766	Open Manhole		1350
12.006	o	450	58	6.180	4.966	0.764	Open Manhole		1350
15.000	o	300	59	7.140	5.640	1.200	Open Manhole		1200
<u>Downstream Manhole</u>									
PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.014	29.639	385.0	47	5.372	3.549	1.373	Open Manhole		1350
1.015	33.280	385.0	77	5.054	3.463	1.141	Open Manhole		1500
12.000	21.226	99.2	52	6.850	5.591	1.034	Open Manhole		1200
13.000	11.599	93.0	50	7.220	5.720	1.200	Open Manhole		1200
13.001	8.661	108.3	51	7.140	5.640	1.200	Open Manhole		1200
13.002	29.592	238.0	52	6.850	5.516	1.034	Open Manhole		1200
12.001	23.632	238.0	53	6.650	5.417	0.933	Open Manhole		1200
12.002	16.754	238.0	54	6.850	5.347	1.203	Open Manhole		1350
12.003	17.691	313.0	55	6.400	5.215	0.810	Open Manhole		1350
12.004	30.500	246.0	57	6.232	5.016	0.766	Open Manhole		1350
14.000	8.115	238.0	57	6.232	5.166	0.766	Open Manhole		1350
12.005	19.159	385.0	58	6.180	4.966	0.764	Open Manhole		1350
12.006	64.550	377.5	BASIN 2	6.015	4.795	0.770	Open Manhole		1350
15.000	10.566	238.0	60	7.120	5.596	1.224	Open Manhole		1200
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<u>PIPELINE SCHEDULES for Storm</u> <u>Upstream Manhole</u> <table><tr><th>PN</th><th>Hyd Sect</th><th>Diam (mm)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>15.001</td><td>o</td><td>300</td><td>60</td><td>7.120</td><td>5.596</td><td>1.224</td><td>Open Manhole</td><td>1200</td></tr><tr><td>15.002</td><td>o</td><td>300</td><td>61</td><td>6.900</td><td>5.400</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>16.000</td><td>o</td><td>300</td><td>62</td><td>7.180</td><td>5.680</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>16.001</td><td>o</td><td>300</td><td>63</td><td>6.920</td><td>5.420</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>15.003</td><td>o</td><td>375</td><td>64</td><td>6.800</td><td>5.223</td><td>1.202</td><td>Open Manhole</td><td>1350</td></tr><tr><td>15.004</td><td>o</td><td>375</td><td>65</td><td>6.500</td><td>4.925</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.007</td><td>o</td><td>450</td><td>BASIN 2</td><td>6.015</td><td>4.795</td><td>0.770</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.008</td><td>o</td><td>450</td><td>67</td><td>6.337</td><td>4.708</td><td>1.179</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.009</td><td>o</td><td>450</td><td>68</td><td>6.369</td><td>4.644</td><td>1.275</td><td>Open Manhole</td><td>1350</td></tr><tr><td>17.000</td><td>o</td><td>300</td><td>69</td><td>6.840</td><td>5.340</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>17.001</td><td>o</td><td>300</td><td>70</td><td>6.700</td><td>5.200</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>17.002</td><td>o</td><td>300</td><td>71</td><td>6.680</td><td>5.160</td><td>1.220</td><td>Open Manhole</td><td>1200</td></tr><tr><td>17.003</td><td>o</td><td>300</td><td>72</td><td>6.400</td><td>4.900</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>12.010</td><td>o</td><td>450</td><td>73</td><td>6.031</td><td>4.576</td><td>1.005</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.011</td><td>o</td><td>450</td><td>BASIN 3</td><td>5.664</td><td>4.164</td><td>1.050</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.012</td><td>o</td><td>450</td><td>75</td><td>5.400</td><td>3.750</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr></table> <u>Downstream Manhole</u> <table><tr><th>PN</th><th>Length (m)</th><th>Slope (1:X)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>15.001</td><td>21.828</td><td>111.4</td><td>61</td><td>6.900</td><td>5.400</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>15.002</td><td>11.956</td><td>117.2</td><td>64</td><td>6.800</td><td>5.298</td><td>1.202</td><td>Open Manhole</td><td>1350</td></tr><tr><td>16.000</td><td>19.906</td><td>76.6</td><td>63</td><td>6.920</td><td>5.420</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>16.001</td><td>12.505</td><td>102.2</td><td>64</td><td>6.800</td><td>5.298</td><td>1.202</td><td>Open Manhole</td><td>1350</td></tr><tr><td>15.003</td><td>20.466</td><td>68.7</td><td>65</td><td>6.500</td><td>4.925</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>15.004</td><td>21.142</td><td>162.6</td><td>BASIN 2</td><td>6.015</td><td>4.795</td><td>0.845</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.007</td><td>33.565</td><td>385.8</td><td>67</td><td>6.337</td><td>4.708</td><td>1.179</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.008</td><td>24.805</td><td>385.0</td><td>68</td><td>6.369</td><td>4.644</td><td>1.275</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.009</td><td>26.253</td><td>385.0</td><td>73</td><td>6.031</td><td>4.576</td><td>1.005</td><td>Open Manhole</td><td>1350</td></tr><tr><td>17.000</td><td>15.513</td><td>110.8</td><td>70</td><td>6.700</td><td>5.200</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>17.001</td><td>9.427</td><td>235.7</td><td>71</td><td>6.680</td><td>5.160</td><td>1.220</td><td>Open Manhole</td><td>1200</td></tr><tr><td>17.002</td><td>36.243</td><td>139.4</td><td>72</td><td>6.400</td><td>4.900</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>17.003</td><td>19.704</td><td>113.2</td><td>73</td><td>6.031</td><td>4.726</td><td>1.005</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.010</td><td>24.041</td><td>58.4</td><td>BASIN 3</td><td>5.664</td><td>4.164</td><td>1.050</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.011</td><td>35.682</td><td>86.2</td><td>75</td><td>5.400</td><td>3.750</td><td>1.200</td><td>Open Manhole</td><td>1350</td></tr><tr><td>12.012</td><td>40.766</td><td>203.8</td><td>76</td><td>5.100</td><td>3.550</td><td>1.100</td><td>Open Manhole</td><td>1350</td></tr></table>										PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	15.001	o	300	60	7.120	5.596	1.224	Open Manhole	1200	15.002	o	300	61	6.900	5.400	1.200	Open Manhole	1200	16.000	o	300	62	7.180	5.680	1.200	Open Manhole	1200	16.001	o	300	63	6.920	5.420	1.200	Open Manhole	1200	15.003	o	375	64	6.800	5.223	1.202	Open Manhole	1350	15.004	o	375	65	6.500	4.925	1.200	Open Manhole	1350	12.007	o	450	BASIN 2	6.015	4.795	0.770	Open Manhole	1350	12.008	o	450	67	6.337	4.708	1.179	Open Manhole	1350	12.009	o	450	68	6.369	4.644	1.275	Open Manhole	1350	17.000	o	300	69	6.840	5.340	1.200	Open Manhole	1200	17.001	o	300	70	6.700	5.200	1.200	Open Manhole	1200	17.002	o	300	71	6.680	5.160	1.220	Open Manhole	1200	17.003	o	300	72	6.400	4.900	1.200	Open Manhole	1200	12.010	o	450	73	6.031	4.576	1.005	Open Manhole	1350	12.011	o	450	BASIN 3	5.664	4.164	1.050	Open Manhole	1350	12.012	o	450	75	5.400	3.750	1.200	Open Manhole	1350	PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	15.001	21.828	111.4	61	6.900	5.400	1.200	Open Manhole	1200	15.002	11.956	117.2	64	6.800	5.298	1.202	Open Manhole	1350	16.000	19.906	76.6	63	6.920	5.420	1.200	Open Manhole	1200	16.001	12.505	102.2	64	6.800	5.298	1.202	Open Manhole	1350	15.003	20.466	68.7	65	6.500	4.925	1.200	Open Manhole	1350	15.004	21.142	162.6	BASIN 2	6.015	4.795	0.845	Open Manhole	1350	12.007	33.565	385.8	67	6.337	4.708	1.179	Open Manhole	1350	12.008	24.805	385.0	68	6.369	4.644	1.275	Open Manhole	1350	12.009	26.253	385.0	73	6.031	4.576	1.005	Open Manhole	1350	17.000	15.513	110.8	70	6.700	5.200	1.200	Open Manhole	1200	17.001	9.427	235.7	71	6.680	5.160	1.220	Open Manhole	1200	17.002	36.243	139.4	72	6.400	4.900	1.200	Open Manhole	1200	17.003	19.704	113.2	73	6.031	4.726	1.005	Open Manhole	1350	12.010	24.041	58.4	BASIN 3	5.664	4.164	1.050	Open Manhole	1350	12.011	35.682	86.2	75	5.400	3.750	1.200	Open Manhole	1350	12.012	40.766	203.8	76	5.100	3.550	1.100	Open Manhole	1350
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)																																																																																																																																																																																																																																																																																																																			
15.001	o	300	60	7.120	5.596	1.224	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
15.002	o	300	61	6.900	5.400	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
16.000	o	300	62	7.180	5.680	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
16.001	o	300	63	6.920	5.420	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
15.003	o	375	64	6.800	5.223	1.202	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
15.004	o	375	65	6.500	4.925	1.200	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.007	o	450	BASIN 2	6.015	4.795	0.770	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.008	o	450	67	6.337	4.708	1.179	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.009	o	450	68	6.369	4.644	1.275	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
17.000	o	300	69	6.840	5.340	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
17.001	o	300	70	6.700	5.200	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
17.002	o	300	71	6.680	5.160	1.220	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
17.003	o	300	72	6.400	4.900	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
12.010	o	450	73	6.031	4.576	1.005	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.011	o	450	BASIN 3	5.664	4.164	1.050	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.012	o	450	75	5.400	3.750	1.200	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)																																																																																																																																																																																																																																																																																																																			
15.001	21.828	111.4	61	6.900	5.400	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
15.002	11.956	117.2	64	6.800	5.298	1.202	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
16.000	19.906	76.6	63	6.920	5.420	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
16.001	12.505	102.2	64	6.800	5.298	1.202	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
15.003	20.466	68.7	65	6.500	4.925	1.200	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
15.004	21.142	162.6	BASIN 2	6.015	4.795	0.845	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.007	33.565	385.8	67	6.337	4.708	1.179	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.008	24.805	385.0	68	6.369	4.644	1.275	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.009	26.253	385.0	73	6.031	4.576	1.005	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
17.000	15.513	110.8	70	6.700	5.200	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
17.001	9.427	235.7	71	6.680	5.160	1.220	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
17.002	36.243	139.4	72	6.400	4.900	1.200	Open Manhole	1200																																																																																																																																																																																																																																																																																																																			
17.003	19.704	113.2	73	6.031	4.726	1.005	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.010	24.041	58.4	BASIN 3	5.664	4.164	1.050	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.011	35.682	86.2	75	5.400	3.750	1.200	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
12.012	40.766	203.8	76	5.100	3.550	1.100	Open Manhole	1350																																																																																																																																																																																																																																																																																																																			
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<u>PIPELINE SCHEDULES for Storm</u>									
<u>Upstream Manhole</u>									
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	
12.013	o	450	76	5.100	3.550	1.100	Open Manhole		1350
1.016	o	525	77	5.054	3.388	1.141	Open Manhole		1500
1.017	o	525	78	4.912	3.351	1.036	Open Manhole		1500
18.000	o	525	TANK	5.101	3.301	1.275	Open Manhole		1500
1.018	o	525	80	4.991	3.288	1.178	Open Manhole		1500
1.019	o	525	BASIN 4	5.070	3.249	1.296	Open Manhole		1500
1.020	o	525	82	4.914	3.215	1.174	Open Manhole		1500
19.000	o	450	83	5.757	4.407	0.900	Open Manhole		1350
20.000	o	375	84	6.150	4.875	0.900	Open Manhole		1350
20.001	o	375	85	6.300	4.762	1.163	Open Manhole		1350
19.001	o	450	86	6.248	4.314	1.484	Open Manhole		1350
19.002	o	450	87	6.822	4.171	2.201	Open Manhole		1350
21.000	o	300	88	6.450	4.950	1.200	Open Manhole		1200
21.001	o	300	89	6.800	4.832	1.668	Open Manhole		1200
<u>Downstream Manhole</u>									
PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	
12.013	6.269	72.1	77	5.054	3.463	1.141	Open Manhole		1500
1.016	16.777	450.0	78	4.912	3.351	1.036	Open Manhole		1500
1.017	28.335	450.0	80	4.991	3.288	1.178	Open Manhole		1500
18.000	5.866	451.2	80	4.991	3.288	1.178	Open Manhole		1500
1.018	23.040	590.8	BASIN 4	5.070	3.249	1.296	Open Manhole		1500
1.019	15.210	447.4	82	4.914	3.215	1.174	Open Manhole		1500
1.020	58.087	79.5	98	4.758	2.484	1.749	Open Manhole		1500
19.000	27.788	300.0	86	6.248	4.314	1.484	Open Manhole		1350
20.000	35.481	313.0	85	6.300	4.762	1.163	Open Manhole		1350
20.001	8.071	21.6	86	6.248	4.389	1.484	Open Manhole		1350
19.001	55.215	385.0	87	6.822	4.171	2.201	Open Manhole		1350
19.002	10.549	204.5	90	6.689	4.119	2.120	Open Manhole		1350
21.000	28.079	238.0	89	6.800	4.832	1.668	Open Manhole		1200
21.001	8.510	15.1	90	6.689	4.269	2.120	Open Manhole		1350
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<u>Upstream Manhole</u>									
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	
19.003	o	450	90	6.689	4.119	2.120	Open Manhole	1350	
22.000	o	225	91	6.350	4.925	1.200	Open Manhole	1200	
22.001	o	225	92	6.300	4.798	1.277	Open Manhole	1200	
19.004	o	450	93	6.169	3.983	1.736	Open Manhole	1350	
19.005	o	450	94	6.029	3.940	1.639	Open Manhole	1350	
19.006	o	450	95	5.537	3.812	1.275	Open Manhole	1350	
19.007	o	450	96	5.269	3.740	1.079	Open Manhole	1350	
19.008	o	450	BASIN 5	5.180	3.188	1.542	Open Manhole	1350	
1.021	o	600	98	4.758	2.409	1.749	Open Manhole	1500	
<u>Downstream Manhole</u>									
PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	
19.003	52.174	385.0	93	6.169	3.983	1.736	Open Manhole	1350	
22.000	21.192	166.9	92	6.300	4.798	1.277	Open Manhole	1200	
22.001	9.468	16.0	93	6.169	4.208	1.736	Open Manhole	1350	
19.004	16.548	384.8	94	6.029	3.940	1.639	Open Manhole	1350	
19.005	49.152	385.0	95	5.537	3.812	1.275	Open Manhole	1350	
19.006	27.544	385.0	96	5.269	3.740	1.079	Open Manhole	1350	
19.007	18.709	33.9	BASIN 5	5.180	3.188	1.542	Open Manhole	1350	
19.008	20.031	31.8	98	4.758	2.559	1.749	Open Manhole	1500	
1.021	10.643	425.7		4.829	2.384	1.845	Open Manhole	0	
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<u>Area Summary for Storm</u>						
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.041	0.041	0.041
2.000	-	-	100	0.149	0.149	0.149
2.001	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.100	0.100	0.100
1.002	-	-	100	0.037	0.037	0.037
3.000	-	-	100	0.080	0.080	0.080
3.001	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.138	0.138	0.138
1.004	-	-	100	0.095	0.095	0.095
1.005	-	-	100	0.101	0.101	0.101
4.000	-	-	100	0.046	0.046	0.046
1.006	-	-	100	0.115	0.115	0.115
5.000	-	-	100	0.206	0.206	0.206
5.001	-	-	100	0.000	0.000	0.000
5.002	-	-	100	0.000	0.000	0.000
5.003	-	-	100	0.146	0.146	0.146
6.000	-	-	100	0.109	0.109	0.109
6.001	-	-	100	0.000	0.000	0.000
6.002	-	-	100	0.000	0.000	0.000
5.004	-	-	100	0.016	0.016	0.016
5.005	-	-	100	0.072	0.072	0.072
7.000	-	-	100	0.082	0.082	0.082
7.001	-	-	100	0.103	0.103	0.103
5.006	-	-	100	0.063	0.063	0.063
5.007	-	-	100	0.036	0.036	0.036
8.000	-	-	100	0.041	0.041	0.041
5.008	-	-	100	0.064	0.064	0.064
9.000	-	-	100	0.104	0.104	0.104
5.009	-	-	100	0.035	0.035	0.035
10.000	-	-	100	0.107	0.107	0.107
10.001	-	-	100	0.104	0.104	0.104
10.002	-	-	100	0.061	0.061	0.061
10.003	-	-	100	0.096	0.096	0.096
10.004	-	-	100	0.000	0.000	0.000
10.005	-	-	100	0.169	0.169	0.169
10.006	-	-	100	0.054	0.054	0.054
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.046	0.046	0.046
1.011	-	-	100	0.056	0.056	0.056
1.012	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.040	0.040	0.040
11.000	-	-	100	0.153	0.153	0.153
11.001	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.058	0.058	0.058
1.015	-	-	100	0.052	0.052	0.052
12.000	-	-	100	0.046	0.046	0.046
13.000	-	-	100	0.029	0.029	0.029
13.001	-	-	100	0.050	0.050	0.050
13.002	-	-	100	0.022	0.022	0.022
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Area Summary for Storm						
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
12.001	-	-	100	0.067	0.067	0.067
12.002	-	-	100	0.000	0.000	0.000
12.003	-	-	100	0.051	0.051	0.051
12.004	-	-	100	0.019	0.019	0.019
14.000	-	-	100	0.115	0.115	0.115
12.005	-	-	100	0.000	0.000	0.000
12.006	-	-	100	0.000	0.000	0.000
15.000	-	-	100	0.090	0.090	0.090
15.001	-	-	100	0.000	0.000	0.000
15.002	-	-	100	0.091	0.091	0.091
16.000	-	-	100	0.072	0.072	0.072
16.001	-	-	100	0.051	0.051	0.051
15.003	-	-	100	0.042	0.042	0.042
15.004	-	-	100	0.120	0.120	0.120
12.007	-	-	100	0.000	0.000	0.000
12.008	-	-	100	0.000	0.000	0.000
12.009	-	-	100	0.000	0.000	0.000
17.000	-	-	100	0.136	0.136	0.136
17.001	-	-	100	0.044	0.044	0.044
17.002	-	-	100	0.000	0.000	0.000
17.003	-	-	100	0.163	0.163	0.163
12.010	-	-	100	0.000	0.000	0.000
12.011	-	-	100	0.000	0.000	0.000
12.012	-	-	100	0.000	0.000	0.000
12.013	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.183	0.183	0.183
1.017	-	-	100	0.081	0.081	0.081
18.000	-	-	100	0.000	0.000	0.000
1.018	-	-	100	0.000	0.000	0.000
1.019	-	-	100	0.000	0.000	0.000
1.020	-	-	100	0.000	0.000	0.000
19.000	-	-	100	0.122	0.122	0.122
20.000	-	-	100	0.145	0.145	0.145
20.001	-	-	100	0.000	0.000	0.000
19.001	-	-	100	0.040	0.040	0.040
19.002	-	-	100	0.071	0.071	0.071
21.000	-	-	100	0.126	0.126	0.126
21.001	-	-	100	0.000	0.000	0.000
19.003	-	-	100	0.017	0.017	0.017
22.000	-	-	100	0.116	0.116	0.116
22.001	-	-	100	0.000	0.000	0.000
19.004	-	-	100	0.110	0.110	0.110
19.005	-	-	100	0.058	0.058	0.058
19.006	-	-	100	0.148	0.148	0.148
19.007	-	-	100	0.070	0.070	0.070
19.008	-	-	100	0.000	0.000	0.000
1.021	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				5.470	5.470	5.470
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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.021	4.829	2.384	0.000	0	0

Simulation Criteria for Storm

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 Storage Structures	6
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 497050 103400 SU 97050 03400
C (1km)	-0.025
D1 (1km)	0.395
D2 (1km)	0.244
D3 (1km)	0.395
E (1km)	0.309
F (1km)	2.339
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: BASIN 1, DS/PN: 1.007, Volume (m³): 42.0

Unit Reference	MD-SHE-0091-4200-1400-4200
Design Head (m)	1.400
Design Flow (l/s)	4.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	91
Invert Level (m)	4.201
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	4.2
Flush-Flo™	0.398	4.1
Kick-Flo®	0.814	3.3
Mean Flow over Head Range	-	3.6

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	2.9	1.200	3.9	3.000	6.0	7.000	8.9
0.200	3.8	1.400	4.2	3.500	6.4	7.500	9.2
0.300	4.0	1.600	4.5	4.000	6.9	8.000	9.5
0.400	4.1	1.800	4.7	4.500	7.2	8.500	9.8
0.500	4.0	2.000	5.0	5.000	7.6	9.000	10.1
0.600	3.9	2.200	5.2	5.500	8.0	9.500	10.3
0.800	3.3	2.400	5.4	6.000	8.3		
1.000	3.6	2.600	5.6	6.500	8.6		

Hydro-Brake® Optimum Manhole: BASIN 2, DS/PN: 12.007, Volume (m³): 14.0

Unit Reference	MD-SHE-0319-6000-0920-6000
Design Head (m)	0.920
Design Flow (l/s)	60.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	319
Invert Level (m)	4.795
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

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Hydro-Brake® Optimum Manhole: BASIN 2, DS/PN: 12.007, Volume (m³): 14.0

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.920	60.0
Flush-Flo™	0.462	60.0
Kick-Flo®	0.754	54.5
Mean Flow over Head Range	-	46.8

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	9.6	1.200	68.2	3.000	106.4	7.000	161.0
0.200	32.7	1.400	73.5	3.500	114.7	7.500	166.5
0.300	57.3	1.600	78.4	4.000	122.4	8.000	171.9
0.400	59.7	1.800	83.0	4.500	129.7	8.500	177.1
0.500	59.9	2.000	87.4	5.000	136.5	9.000	182.1
0.600	58.8	2.200	91.5	5.500	143.1	9.500	185.5
0.800	56.1	2.400	95.5	6.000	149.3		
1.000	62.4	2.600	99.2	6.500	155.2		

Hydro-Brake® Optimum Manhole: BASIN 3, DS/PN: 12.011, Volume (m³): 5.8

Unit Reference	MD-SHE-0187-1800-1200-1800
Design Head (m)	1.200
Design Flow (l/s)	18.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	187
Invert Level (m)	4.164
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	18.0
Flush-Flo™	0.374	17.9
Kick-Flo®	0.818	15.0
Mean Flow over Head Range	-	15.4

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	6.5	0.300	17.8	0.500	17.7	0.800	15.4
0.200	16.8	0.400	17.9	0.600	17.3	1.000	16.5

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Innovyze	Network 2020.1						
<u>Hydro-Brake® Optimum Manhole: BASIN 3, DS/PN: 12.011, Volume (m³): 5.8</u>							
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.200	18.0	2.400	25.1	5.000	35.7	8.000	44.8
1.400	19.4	2.600	26.0	5.500	37.3	8.500	46.1
1.600	20.6	3.000	27.9	6.000	38.9	9.000	47.4
1.800	21.8	3.500	30.0	6.500	40.5	9.500	48.6
2.000	23.0	4.000	32.0	7.000	42.0		
2.200	24.0	4.500	33.9	7.500	43.4		
<u>Hydro-Brake® Optimum Manhole: BASIN 4, DS/PN: 1.019, Volume (m³): 7.9</u>			Unit Reference MD-SHE-0190-1980-1520-1980 Design Head (m) 1.520 Design Flow (l/s) 19.8 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 190 Invert Level (m) 3.249 Minimum Outlet Pipe Diameter (mm) 225 Suggested Manhole Diameter (mm) 1500				
Control Points		Head (m)		Flow (l/s)			
Design Point (Calculated)		1.520		19.8			
Flush-Flo™		0.455		19.8			
Kick-Flo®		0.991		16.2			
Mean Flow over Head Range		-		17.1			
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated							
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	17.7	3.000	27.4	7.000	41.2
0.200	17.5	1.400	19.0	3.500	29.5	7.500	42.6
0.300	19.2	1.600	20.3	4.000	31.5	8.000	44.0
0.400	19.7	1.800	21.5	4.500	33.3	8.500	45.3
0.500	19.8	2.000	22.6	5.000	35.0	9.000	46.5
0.600	19.5	2.200	23.6	5.500	36.7	9.500	47.8
0.800	18.7	2.400	24.6	6.000	38.2		
1.000	16.2	2.600	25.6	6.500	39.8		
<u>Hydro-Brake® Optimum Manhole: BASIN 5, DS/PN: 19.008, Volume (m³): 5.6</u>			Unit Reference MD-SHE-0058-1900-1692-1900 Design Head (m) 1.692 Design Flow (l/s) 1.9 Flush-Flo™ Calculated				
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Tuscany House White Hart Lane Basingstoke RG21 4AF																																																																																																							
Date 26/08/2021 18:46 File 2021-08-17 Network - NA...	Designed by BASPC1 Checked by																																																																																																						
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<u>Hydro-Brake® Optimum Manhole: BASIN 5, DS/PN: 19.008, Volume (m³): 5.6</u> <table><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>58</td></tr><tr><td>Invert Level (m)</td><td>3.188</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>75</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1200</td></tr></table> <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.692</td><td>1.9</td></tr><tr><td>Flush-Flo™</td><td>0.254</td><td>1.4</td></tr><tr><td>Kick-Flo®</td><td>0.516</td><td>1.1</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>1.4</td></tr></table> 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 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>1.2</td><td>1.200</td><td>1.6</td><td>3.000</td><td>2.5</td><td>7.000</td><td>3.7</td></tr><tr><td>0.200</td><td>1.3</td><td>1.400</td><td>1.7</td><td>3.500</td><td>2.7</td><td>7.500</td><td>3.8</td></tr><tr><td>0.300</td><td>1.4</td><td>1.600</td><td>1.9</td><td>4.000</td><td>2.8</td><td>8.000</td><td>3.9</td></tr><tr><td>0.400</td><td>1.3</td><td>1.800</td><td>2.0</td><td>4.500</td><td>3.0</td><td>8.500</td><td>4.0</td></tr><tr><td>0.500</td><td>1.2</td><td>2.000</td><td>2.0</td><td>5.000</td><td>3.1</td><td>9.000</td><td>4.1</td></tr><tr><td>0.600</td><td>1.2</td><td>2.200</td><td>2.1</td><td>5.500</td><td>3.3</td><td>9.500</td><td>4.2</td></tr><tr><td>0.800</td><td>1.4</td><td>2.400</td><td>2.2</td><td>6.000</td><td>3.4</td><td></td><td></td></tr><tr><td>1.000</td><td>1.5</td><td>2.600</td><td>2.3</td><td>6.500</td><td>3.5</td><td></td><td></td></tr></table>			Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	58	Invert Level (m)	3.188	Minimum Outlet Pipe Diameter (mm)	75	Suggested Manhole Diameter (mm)	1200	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.692	1.9	Flush-Flo™	0.254	1.4	Kick-Flo®	0.516	1.1	Mean Flow over Head Range	-	1.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	1.2	1.200	1.6	3.000	2.5	7.000	3.7	0.200	1.3	1.400	1.7	3.500	2.7	7.500	3.8	0.300	1.4	1.600	1.9	4.000	2.8	8.000	3.9	0.400	1.3	1.800	2.0	4.500	3.0	8.500	4.0	0.500	1.2	2.000	2.0	5.000	3.1	9.000	4.1	0.600	1.2	2.200	2.1	5.500	3.3	9.500	4.2	0.800	1.4	2.400	2.2	6.000	3.4			1.000	1.5	2.600	2.3	6.500	3.5		
Objective	Minimise upstream storage																																																																																																						
Application	Surface																																																																																																						
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0.100	1.2	1.200	1.6	3.000	2.5	7.000	3.7																																																																																																
0.200	1.3	1.400	1.7	3.500	2.7	7.500	3.8																																																																																																
0.300	1.4	1.600	1.9	4.000	2.8	8.000	3.9																																																																																																
0.400	1.3	1.800	2.0	4.500	3.0	8.500	4.0																																																																																																
0.500	1.2	2.000	2.0	5.000	3.1	9.000	4.1																																																																																																
0.600	1.2	2.200	2.1	5.500	3.3	9.500	4.2																																																																																																
0.800	1.4	2.400	2.2	6.000	3.4																																																																																																		
1.000	1.5	2.600	2.3	6.500	3.5																																																																																																		
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Date 26/08/2021 18:46 File 2021-08-17 Network - NA...	Designed by BASPC1 Checked by																			
Innovyze Network 2020.1																				
<u>Storage Structures for Storm</u>																				
<u>Tank or Pond Manhole: BASIN 1, DS/PN: 1.007</u>																				
Invert Level (m) 4.201																				
<table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>952.2</td><td>1.700</td><td>2459.3</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	952.2	1.700	2459.3										
Depth (m)	Area (m²)	Depth (m)	Area (m²)																	
0.000	952.2	1.700	2459.3																	
<u>Tank or Pond Manhole: BASIN 2, DS/PN: 12.007</u>																				
Invert Level (m) 4.795																				
<table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>110.1</td><td>1.220</td><td>344.8</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	110.1	1.220	344.8										
Depth (m)	Area (m²)	Depth (m)	Area (m²)																	
0.000	110.1	1.220	344.8																	
<u>Tank or Pond Manhole: BASIN 3, DS/PN: 12.011</u>																				
Invert Level (m) 4.164																				
<table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>187.2</td><td>1.500</td><td>501.8</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	187.2	1.500	501.8										
Depth (m)	Area (m²)	Depth (m)	Area (m²)																	
0.000	187.2	1.500	501.8																	
<u>Cellular Storage Manhole: TANK, DS/PN: 18.000</u>																				
Invert Level (m) 3.301 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000																				
<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>240.0</td><td>240.0</td><td>1.501</td><td>0.0</td><td>333.0</td></tr><tr><td>1.500</td><td>240.0</td><td>333.0</td><td></td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	240.0	240.0	1.501	0.0	333.0	1.500	240.0	333.0			
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)															
0.000	240.0	240.0	1.501	0.0	333.0															
1.500	240.0	333.0																		
<u>Tank or Pond Manhole: BASIN 4, DS/PN: 1.019</u>																				
Invert Level (m) 3.249																				
<table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>63.2</td><td>1.820</td><td>322.8</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	63.2	1.820	322.8										
Depth (m)	Area (m²)	Depth (m)	Area (m²)																	
0.000	63.2	1.820	322.8																	
<u>Tank or Pond Manhole: BASIN 5, DS/PN: 19.008</u>																				
Invert Level (m) 3.188																				
<table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>234.7</td><td>1.992</td><td>910.6</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	234.7	1.992	910.6										
Depth (m)	Area (m²)	Depth (m)	Area (m²)																	
0.000	234.7	1.992	910.6																	
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Innovyze		Network 2020.1						
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>								
<u>Simulation Criteria</u>								
Areal Reduction Factor		1.000		Additional Flow - % of Total Flow 0.000				
Hot Start (mins)		0		MADD Factor * 10m³/ha Storage 2.000				
Hot Start Level (mm)		0		Inlet Coeffiecient 0.800				
Manhole Headloss Coeff (Global)		0.500		Flow per Person per Day (l/per/day) 0.000				
Foul Sewage per hectare (l/s)		0.000						
Number of Input Hydrographs		0		Number of Storage Structures 6				
Number of Online Controls		5		Number of Time/Area Diagrams 0				
Number of Offline Controls		0		Number of Real Time Controls 0				
<u>Synthetic Rainfall Details</u>								
Rainfall Model				FEH				
FEH Rainfall Version				2013				
Site Location		GB 497526 102719		SU 97526 02719				
Data Type				Point				
Cv (Summer)				0.750				
Cv (Winter)				0.840				
Margin for Flood Risk Warning (mm)				300.0				
Analysis Timestep		2.5		Second Increment (Extended)				
DTS Status				ON				
DVD Status				ON				
Inertia Status				ON				
Profile(s)				Summer and Winter				
Duration(s) (mins)		15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080						
Return Period(s) (years)				100				
Climate Change (%)				40				
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	100	+40%	100/15 Summer			
2.000	2	15 Winter	100	+40%	100/15 Summer	100/15 Winter		
2.001	3	15 Winter	100	+40%	100/15 Summer			
1.001	4	15 Winter	100	+40%	100/15 Summer			
1.002	5	15 Winter	100	+40%	100/15 Summer			
3.000	6	15 Winter	100	+40%	100/15 Summer			
3.001	7	15 Winter	100	+40%	100/15 Summer			
1.003	8	15 Winter	100	+40%	100/15 Summer			
1.004	9	15 Winter	100	+40%	100/15 Summer			
1.005	10	15 Winter	100	+40%	100/15 Summer			
4.000	11	10080 Winter	100	+40%	100/15 Summer			
1.006	12	10080 Winter	100	+40%	100/15 Summer			
5.000	13	15 Winter	100	+40%	100/15 Summer	100/15 Winter		
5.001	14	15 Winter	100	+40%	100/15 Summer			
5.002	15	15 Winter	100	+40%	100/15 Summer			
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Innovyze				Network 2020.1					
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
		Water	Surcharged	Flooded			Half Drain	Pipe	
	US/MH	Level	Depth	Volume	Flow /	Overflow	Time	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status
1.000	1	6.502	0.733	0.000	0.27			21.3	SURCHARGED
2.000	2	6.640	0.880	0.012	0.66			74.1	FLOOD
2.001	3	6.563	0.913	0.000	0.72			74.2	FLOOD RISK
1.001	4	6.480	0.893	0.000	1.49			135.5	SURCHARGED
1.002	5	6.362	0.825	0.000	1.20			152.4	SURCHARGED
3.000	6	6.379	0.673	0.000	0.24			41.1	SURCHARGED
3.001	7	6.247	0.762	0.000	0.32			43.3	SURCHARGED
1.003	8	6.131	0.768	0.000	1.76			247.5	SURCHARGED
1.004	9	5.894	0.607	0.000	1.47			284.8	SURCHARGED
1.005	10	5.595	0.444	0.000	1.72			330.7	SURCHARGED
4.000	11	5.591	0.484	0.000	0.00			0.4	SURCHARGED
1.006	12	5.591	0.556	0.000	0.02			6.4	SURCHARGED
5.000	13	7.002	0.902	1.693	1.39			99.9	FLOOD
5.001	14	6.744	0.817	0.000	1.68			97.3	SURCHARGED
5.002	15	6.606	0.729	0.000	1.45			97.0	SURCHARGED
	US/MH	Level							
PN	Name	Exceeded							
1.000	1								
2.000	2								
2.001	3								
1.001	4								
1.002	5								
3.000	6								
3.001	7								
1.003	8								
1.004	9								
1.005	10								
4.000	11								
1.006	12								
5.000	13	1							
5.001	14								
5.002	15								
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Innovyze				Network 2020.1			
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>							
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow Act.
5.003	16	15 Winter	100	+40%	100/15 Summer		
6.000	17	15 Winter	100	+40%	100/15 Summer		
6.001	18	15 Winter	100	+40%	100/15 Summer		
6.002	19	15 Winter	100	+40%	100/15 Summer		
5.004	20	15 Winter	100	+40%	100/15 Summer		
5.005	21	15 Winter	100	+40%	100/15 Summer		
7.000	22	15 Winter	100	+40%	100/15 Summer		
7.001	23	15 Winter	100	+40%	100/15 Summer		
5.006	24	15 Winter	100	+40%	100/15 Summer		
5.007	25	10080 Winter	100	+40%	100/15 Summer		
8.000	26	10080 Winter	100	+40%	100/15 Summer		
5.008	27	10080 Winter	100	+40%	100/15 Summer		
9.000	28	10080 Winter	100	+40%	100/15 Summer		
5.009	29	10080 Winter	100	+40%	100/15 Summer		
10.000	30	15 Winter	100	+40%	100/15 Summer		
10.001	31	15 Winter	100	+40%	100/15 Summer		
10.002	32	15 Winter	100	+40%	100/15 Summer		
10.003	33	15 Winter	100	+40%	100/15 Summer		
10.004	34	15 Winter	100	+40%	100/15 Summer		
10.005	35	15 Winter	100	+40%	100/15 Summer		
10.006	36	10080 Winter	100	+40%	100/15 Summer		
1.007	BASIN 1	10080 Winter	100	+40%	100/15 Summer		
1.008	38	960 Winter	100	+40%	100/360 Winter		
1.009	39	960 Winter	100	+40%	100/360 Winter		
1.010	40	960 Winter	100	+40%	100/240 Winter		
1.011	41	960 Winter	100	+40%	100/180 Winter		
1.012	42	960 Winter	100	+40%	100/180 Winter		
1.013	43	960 Winter	100	+40%	100/15 Winter		
11.000	44	960 Winter	100	+40%	100/15 Summer		
11.001	45	960 Winter	100	+40%	100/15 Summer		
1.014	46	960 Winter	100	+40%	100/15 Summer		
1.015	47	960 Winter	100	+40%	100/15 Summer		
12.000	48	15 Winter	100	+40%	100/15 Summer		
13.000	49	15 Winter	100	+40%	100/15 Summer		
13.001	50	15 Winter	100	+40%	100/15 Summer		
13.002	51	15 Winter	100	+40%	100/15 Summer		
12.001	52	15 Winter	100	+40%	100/15 Summer		
12.002	53	60 Winter	100	+40%	100/15 Summer		
12.003	54	60 Winter	100	+40%	100/15 Summer		
12.004	55	60 Winter	100	+40%	100/15 Summer		
14.000	56	60 Winter	100	+40%	100/15 Summer		
12.005	57	60 Winter	100	+40%	100/15 Summer		
12.006	58	60 Winter	100	+40%	100/15 Summer		
15.000	59	15 Winter	100	+40%	100/15 Summer		
15.001	60	15 Winter	100	+40%	100/15 Summer		
15.002	61	60 Winter	100	+40%	100/15 Summer		
16.000	62	15 Winter	100	+40%	100/15 Summer		
16.001	63	15 Winter	100	+40%	100/15 Summer		
15.003	64	60 Winter	100	+40%	100/15 Summer		
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Innovyze				Network 2020.1					
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.003	16	6.282	0.586	0.000	0.99			157.7	SURCHARGED
6.000	17	6.392	0.592	0.000	0.77			54.2	SURCHARGED
6.001	18	6.275	0.675	0.000	0.86			52.6	SURCHARGED
6.002	19	6.192	0.642	0.000	1.08			55.1	SURCHARGED
5.004	20	6.125	0.602	0.000	1.51			208.9	SURCHARGED
5.005	21	5.970	0.515	0.000	0.96			236.3	SURCHARGED
7.000	22	6.073	0.223	0.000	0.28			49.3	SURCHARGED
7.001	23	5.938	0.443	0.000	0.48			94.8	SURCHARGED
5.006	24	5.764	0.528	0.000	1.13			336.7	SURCHARGED
5.007	25	5.592	0.506	0.000	0.02			6.1	SURCHARGED
8.000	26	5.592	0.620	0.000	0.03			0.3	FLOOD RISK
5.008	27	5.592	0.677	0.000	0.03			7.1	FLOOD RISK
9.000	28	5.592	0.640	0.000	0.02			0.8	SURCHARGED
5.009	29	5.591	0.736	0.000	0.03			8.2	FLOOD RISK
10.000	30	6.756	1.179	0.000	0.69			55.5	FLOOD RISK
10.001	31	6.665	1.191	0.000	1.02			103.1	FLOOD RISK
10.002	32	6.540	1.181	0.000	1.28			128.9	SURCHARGED
10.003	33	6.359	1.108	0.000	1.71			170.6	SURCHARGED
10.004	34	6.057	0.905	0.000	1.14			174.6	SURCHARGED
10.005	35	5.873	0.875	0.000	2.70			247.9	SURCHARGED
10.006	36	5.592	0.647	0.000	0.02			4.0	SURCHARGED
1.007	BASIN 1	5.591	0.940	0.000	0.03			4.2	SURCHARGED
1.008	38	4.811	0.228	0.000	0.05			5.2	SURCHARGED
1.009	39	4.810	0.241	0.000	0.03			5.0	SURCHARGED
1.010	40	4.808	0.349	0.000	0.05			6.0	SURCHARGED
1.011	41	4.804	0.382	0.000	0.08			7.7	SURCHARGED
1.012	42	4.802	0.404	0.000	0.07			7.6	SURCHARGED
1.013	43	4.799	0.431	0.000	0.03			9.2	SURCHARGED
11.000	44	4.794	0.444	0.000	0.08			6.1	SURCHARGED
11.001	45	4.795	0.671	0.000	0.10			6.1	SURCHARGED
1.014	46	4.793	0.717	0.000	0.13			17.6	SURCHARGED
1.015	47	4.792	0.793	0.000	0.14			19.5	SURCHARGED
12.000	48	6.414	0.384	0.000	0.51			24.2	SURCHARGED
13.000	49	6.541	0.396	0.000	0.17			14.8	SURCHARGED
13.001	50	6.531	0.511	0.000	0.59			42.0	SURCHARGED
13.002	51	6.437	0.497	0.000	0.79			51.5	SURCHARGED
12.001	52	6.364	0.548	0.000	1.73			110.1	SURCHARGED
12.002	53	6.230	0.513	0.000	0.98			59.8	SURCHARGED
12.003	54	6.168	0.522	0.000	0.79			73.6	SURCHARGED
12.004	55	6.090	0.500	0.000	0.44			77.9	SURCHARGED
14.000	56	6.008	0.508	0.000	0.69			37.2	SURCHARGED
12.005	57	6.004	0.538	0.000	0.84			110.5	FLOOD RISK
12.006	58	5.992	0.576	0.000	0.71			108.5	FLOOD RISK
15.000	59	6.371	0.431	0.000	0.90			51.1	SURCHARGED
15.001	60	6.301	0.406	0.000	0.55			51.3	SURCHARGED
15.002	61	6.196	0.497	0.000	0.69			55.3	SURCHARGED
16.000	62	6.269	0.289	0.000	0.37			40.5	SURCHARGED
16.001	63	6.135	0.415	0.000	0.77			67.9	SURCHARGED
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White Hart Lane

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Micro Drainage

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

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
15.003	64	6.120	0.523	0.000	0.52			105.7	SURCHARGED

PN	US/MH Name	Level Exceeded
5.003		16
6.000		17
6.001		18
6.002		19
5.004		20
5.005		21
7.000		22
7.001		23
5.006		24
5.007		25
8.000		26
5.008		27
9.000		28
5.009		29
10.000		30
10.001		31
10.002		32
10.003		33
10.004		34
10.005		35
10.006		36
1.007	BASIN	1
1.008		38
1.009		39
1.010		40
1.011		41
1.012		42
1.013		43
11.000		44
11.001		45
1.014		46
1.015		47
12.000		48
13.000		49
13.001		50
13.002		51
12.001		52
12.002		53
12.003		54
12.004		55
14.000		56
12.005		57

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Innovyze	Network 2020.1																									
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>																										
	<table><thead><tr><th>PN</th><th>US/MH Name</th><th>Level Exceeded</th></tr></thead><tbody><tr><td>12.006</td><td>58</td><td></td></tr><tr><td>15.000</td><td>59</td><td></td></tr><tr><td>15.001</td><td>60</td><td></td></tr><tr><td>15.002</td><td>61</td><td></td></tr><tr><td>16.000</td><td>62</td><td></td></tr><tr><td>16.001</td><td>63</td><td></td></tr><tr><td>15.003</td><td>64</td><td></td></tr></tbody></table>	PN	US/MH Name	Level Exceeded	12.006	58		15.000	59		15.001	60		15.002	61		16.000	62		16.001	63		15.003	64		
PN	US/MH Name	Level Exceeded																								
12.006	58																									
15.000	59																									
15.001	60																									
15.002	61																									
16.000	62																									
16.001	63																									
15.003	64																									
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Date 26/08/2021 18:46 File 2021-08-17 Network - NA...				Designed by BASPC1 Checked by					
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	
15.004	65	60 Winter	100	+40%	100/15 Summer				
12.007	BASIN 2	60 Winter	100	+40%	100/15 Summer				
12.008	67	180 Winter	100	+40%	100/30 Summer				
12.009	68	180 Winter	100	+40%	100/30 Summer				
17.000	69	15 Winter	100	+40%	100/15 Summer				
17.001	70	15 Winter	100	+40%	100/15 Summer				
17.002	71	15 Winter	100	+40%	100/15 Summer				
17.003	72	15 Winter	100	+40%	100/15 Summer				
12.010	73	180 Winter	100	+40%	100/30 Summer				
12.011	BASIN 3	240 Winter	100	+40%	100/15 Summer				
12.012	75	720 Winter	100	+40%	100/120 Summer				
12.013	76	960 Winter	100	+40%	100/15 Summer				
1.016	77	960 Winter	100	+40%	100/15 Summer				
1.017	78	960 Winter	100	+40%	100/15 Summer				
18.000	TANK	960 Winter	100	+40%	100/30 Summer				
1.018	80	960 Winter	100	+40%	100/15 Summer				
1.019	BASIN 4	960 Winter	100	+40%	100/15 Summer				
1.020	82	960 Winter	100	+40%					
19.000	83	15 Winter	100	+40%	100/15 Summer	100/15 Summer			
20.000	84	15 Winter	100	+40%	100/15 Summer				
20.001	85	15 Winter	100	+40%	100/15 Summer				
19.001	86	15 Winter	100	+40%	100/15 Summer				
19.002	87	15 Winter	100	+40%	100/15 Summer				
21.000	88	15 Winter	100	+40%	100/15 Summer				
21.001	89	15 Winter	100	+40%	100/15 Summer				
19.003	90	15 Winter	100	+40%	100/15 Summer				
22.000	91	15 Winter	100	+40%	100/15 Summer				
22.001	92	15 Winter	100	+40%	100/15 Summer				
19.004	93	15 Winter	100	+40%	100/15 Summer				
19.005	94	15 Winter	100	+40%	100/15 Summer				
19.006	95	2160 Winter	100	+40%	100/15 Summer				
19.007	96	2160 Winter	100	+40%	100/30 Summer				
19.008	BASIN 5	2160 Winter	100	+40%	100/15 Summer				
1.021	98	960 Winter	100	+40%					
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
15.004	65	6.007	0.708	0.000	1.07			141.9	SURCHARGED
12.007	BASIN 2	5.900	0.655	0.000	0.42			59.8	FLOOD RISK
12.008	67	5.556	0.398	0.000	0.41			56.9	SURCHARGED
12.009	68	5.544	0.450	0.000	0.41			56.3	SURCHARGED
17.000	69	6.450	0.810	0.000	0.88			78.2	SURCHARGED
17.001	70	6.335	0.835	0.000	1.83			101.9	SURCHARGED
17.002	71	6.160	0.700	0.000	1.20			103.9	SURCHARGED
17.003	72	5.809	0.609	0.000	2.11			191.1	SURCHARGED
12.010	73	5.532	0.506	0.000	0.29			101.0	SURCHARGED
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Innovyze				Network 2020.1					
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	
12.011	BASIN 3	5.512	0.898	0.000	0.06		17.8	FLOOD RISK	
12.012	75	4.803	0.603	0.000	0.09		18.3	SURCHARGED	
12.013	76	4.794	0.794	0.000	0.11		19.2	SURCHARGED	
1.016	77	4.791	0.878	0.000	0.28		41.9	FLOOD RISK	
1.017	78	4.789	0.913	0.000	0.24		44.8	FLOOD RISK	
18.000	TANK	4.769	0.943	0.000	0.07	723	11.7	SURCHARGED	
1.018	80	4.789	0.976	0.000	0.30		42.2	FLOOD RISK	
1.019	BASIN 4	4.763	0.989	0.000	0.14		19.9	SURCHARGED	
1.020	82	3.283	-0.457	0.000	0.04		19.9	OK	
19.000	83	5.766	0.909	9.030	0.42		65.7	FLOOD	
20.000	84	6.089	0.839	0.000	0.73		74.2	FLOOD RISK	
20.001	85	6.017	0.880	0.000	0.29		69.5	FLOOD RISK	
19.001	86	5.800	1.036	0.000	0.77		115.2	SURCHARGED	
19.002	87	5.753	1.133	0.000	0.84		133.8	SURCHARGED	
21.000	88	5.971	0.721	0.000	1.00		65.0	SURCHARGED	
21.001	89	5.872	0.740	0.000	0.33		61.5	SURCHARGED	
19.003	90	5.674	1.105	0.000	1.26		187.7	SURCHARGED	
22.000	91	5.910	0.760	0.000	1.69		61.8	SURCHARGED	
22.001	92	5.618	0.595	0.000	0.53		57.3	SURCHARGED	
19.004	93	5.465	1.032	0.000	2.41		285.7	SURCHARGED	
19.005	94	5.198	0.808	0.000	2.03		301.6	SURCHARGED	
19.006	95	4.879	0.617	0.000	0.14		19.0	SURCHARGED	
19.007	96	4.878	0.688	0.000	0.05		20.3	SURCHARGED	
19.008	BASIN 5	4.878	1.240	0.000	0.00		1.9	SURCHARGED	
1.021	98	2.548	-0.461	0.000	0.12		21.8	OK	
PN	US/MH Name	Level Exceeded							
15.004		65							
12.007	BASIN 2								
12.008		67							
12.009		68							
17.000		69							
17.001		70							
17.002		71							
17.003		72							
12.010		73							
12.011	BASIN 3								
12.012		75							
12.013		76							
1.016		77							
1.017		78							
18.000	TANK								
1.018		80							
1.019	BASIN 4								
1.020		82							
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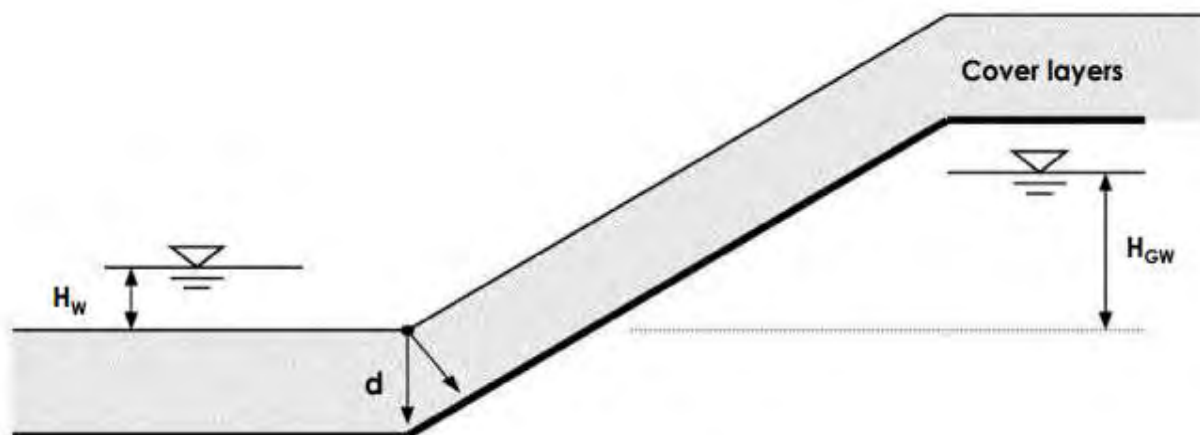
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PN	US/MH Name	Level Exceeded																																																			
19.000	83	4																																																			
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TUSCANY HOUSE, WHITE HART LANE, BASINGSTOKE, RG21 4AF

Project:	Bilsham Road, Yapton	Reference:	19-326
Purpose:	Flotation Calculations	Sheet No:	1 of 5
Calcs By:	JW	Date:	08/03/2021
Checked:	GG	Date:	09/03/2021

REF	CALCULATION	OUTPUT
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Attenuation Basin 1 Details



Basin Cover Level	6.001 mAOD
Basin Invert Level	4.201 mAOD
<u>Groundwater Level at Basin</u>	
WS 16	1.03 mbgl
Ground level at location of WS 16	6.2 mAOD
Groundwater level at location of WS 16	5.17 mAOD
Equivalent level of water if bgl value taken, below level at the basin	4.971 mAOD
Use the higher level of G38 or G40 cells	5.17 mAOD

Note: highest level
recorded

Water level in the pond above the sealing system	Hw =	0 m	Note: Basins normally dry
Groundwater Level above the pond surface	Hgw =	0.969 m	
Unit weight of water	Yw =	10 kN/m3	
Thickness of the cover layers above the sealing system	d =	0.9 m	
Unit weight of soil above the sealing system	Yb =	23 kN/m3	
Partial safety Factor (favourable, permanent loads)	Yg, stb =	0.95 -	
Partial safety Factor (unfavourable, permanent loads)	Yg, dst =	1.05 -	

Buoyancy force σ_a below the liner

$$\sigma_a = (H_{gw} + d) \cdot \gamma_w \cdot \gamma_{g,dst}$$

$$\sigma_{a,d} = 19.6245$$

Load σ_g above the liner

$$\sigma_{g,d} = (d \cdot \gamma_b + H_w \cdot \gamma_w) \cdot \gamma_{g,stb}$$

$$\sigma_{g,d} = 19.665$$

This is the load from any permanent existing water in the basin and the soil

Degree of Utilisation

$$\mu = \sigma_{a,d} / \sigma_{g,d} \leq 1$$

$$\text{Degree of Utilisation} = 0.99794$$

Degree of Utilisation is less than 1 therefore OK

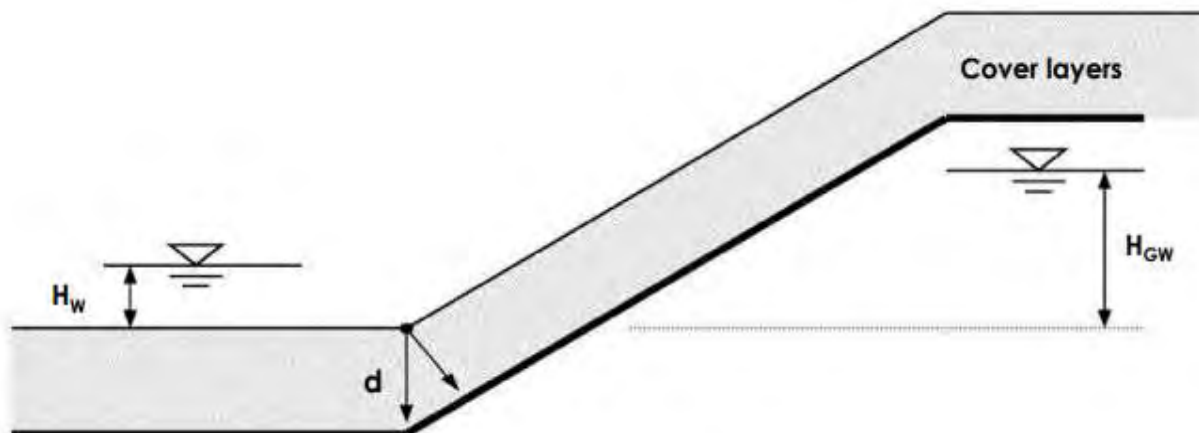
0.9 m depth of soil on top of the liner is required

TUSCANY HOUSE, WHITE HART LANE, BASINGSTOKE, RG21 4AF

Project:	Bilsham Road, Yapton	Reference:	19-326
Purpose:	Flotation Calculations	Sheet No:	1 of 5
Calcs By:	JW	Date:	08/03/2021
Checked:	GG	Date:	09/03/2021

REF	CALCULATION	OUTPUT
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Attenuation Basin 2 Details



Basin Cover Level	6.01 mAOD
Basin Invert Level	4.82 mAOD
<u>Groundwater Level at Basin</u>	
WS 17	1.01 mbgl
Ground level at location of WS 17	5.64 mAOD
Groundwater level at location of WS 17	4.63 mAOD
Equivalent level of water if bgl value taken, below level at the basin	5 mAOD
Use the higher level of G38 or G40 cells	5.005 mAOD

Note: highest level
recorded

Water level in the pond above the sealing system	Hw =	0 m	Note: Basins normally dry
Groundwater Level above the pond surface	Hgw =	0.185 m	
Unit weight of water	Yw =	10 kN/m3	
Thickness of the cover layers above the sealing system	d =	0.3 m	
Unit weight of soil above the sealing system	Yb =	23 kN/m3	
Partial safety Factor (favourable, permanent loads)	Yg,stb =	0.95 -	
Partial safety Factor (unfavourable, permanent loads)	Yg,dst =	1.05 -	

Buoyancy force σ_a below the liner

$$\sigma_a = (H_{gw} + d) \cdot \gamma_w \cdot \gamma_{g,dst}$$

$$\sigma_{a,d} = 5.0925$$

Load σ_g above the liner

$$\sigma_{g,d} = (d \cdot \gamma_b + H_w \cdot \gamma_w) \cdot \gamma_{g,stb}$$

$$\sigma_{g,d} = 6.555$$

This is the load from any permanent existing water in the basin and the soil

Degree of Utilisation

$$\mu = \sigma_{a,d} / \sigma_{g,d} \leq 1$$

$$\text{Degree of Utilisation} = 0.77689$$

Degree of Utilisation is less than 1 therefore OK

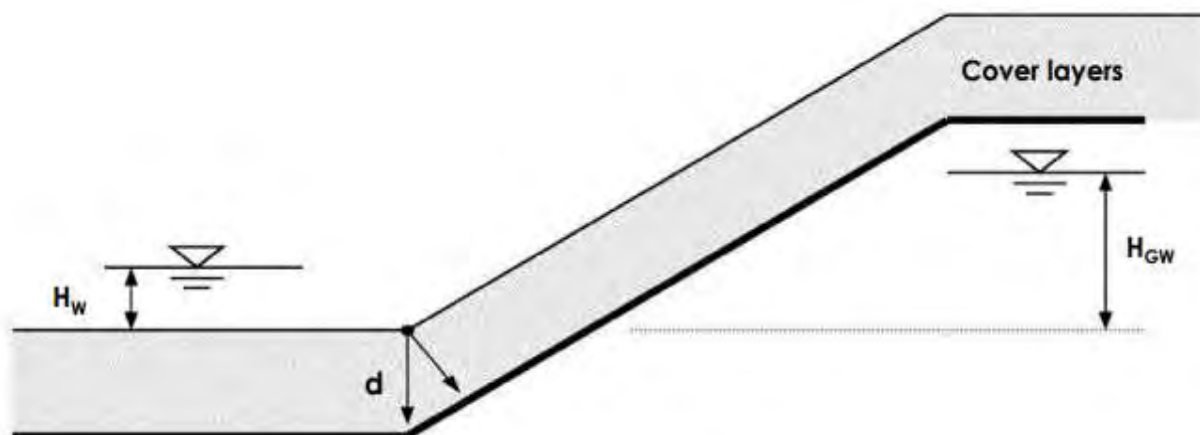
0.3 m depth of soil on top of the liner is required

TUSCANY HOUSE, WHITE HART LANE, BASINGSTOKE, RG21 4AF

Project:	Bilsham Road, Yapton	Reference:	19-326
Purpose:	Flotation Calculations	Sheet No:	1 of 5
Calcs By:	JW	Date:	08/03/2021
Checked:	GG	Date:	09/03/2021

REF	CALCULATION	OUTPUT
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Attenuation Basin 3 Details



Basin Cover Level	5.671 mAOD
Basin Invert Level	4.521 mAOD
<u>Groundwater Level at Basin</u>	
WS 17	1.01 mbgl
Ground level at location of WS 17	5.64 mAOD
Groundwater level at location of WS 17	4.63 mAOD
Equivalent level of water if bgl value taken, below level at the basin	4.661 mAOD
Use the higher level of G38 or G40 cells	4.654 mAOD

Note: highest level
recorded

Water level in the pond above the sealing system	Hw =	0 m	Note: Basins normally dry
Groundwater Level above the pond surface	Hgw =	0.133 m	
Unit weight of water	Yw =	10 kN/m3	
Thickness of the cover layers above the sealing system	d =	0.3 m	
Unit weight of soil above the sealing system	Yb =	23 kN/m3	
Partial safety Factor (favourable, permanent loads)	Yg, stb =	0.95 -	
Partial safety Factor (unfavourable, permanent loads)	Yg, dst =	1.05 -	

Buoyancy force σ_a below the liner

$$\sigma_a = (H_{gw} + d) \cdot \gamma_w \cdot \gamma_{g,dst}$$

$$\sigma_{a,d} = 4.5465$$

Load σ_g above the liner

$$\sigma_{g,d} = (d \cdot \gamma_b + H_w \cdot \gamma_w) \cdot \gamma_{g,stb}$$

$$\sigma_{g,d} = 6.555$$

This is the load from any permanent existing water in the basin and the soil

Degree of Utilisation

$$\mu = \sigma_{a,d} / \sigma_{g,d} \leq 1$$

$$\text{Degree of Utilisation} = 0.69359$$

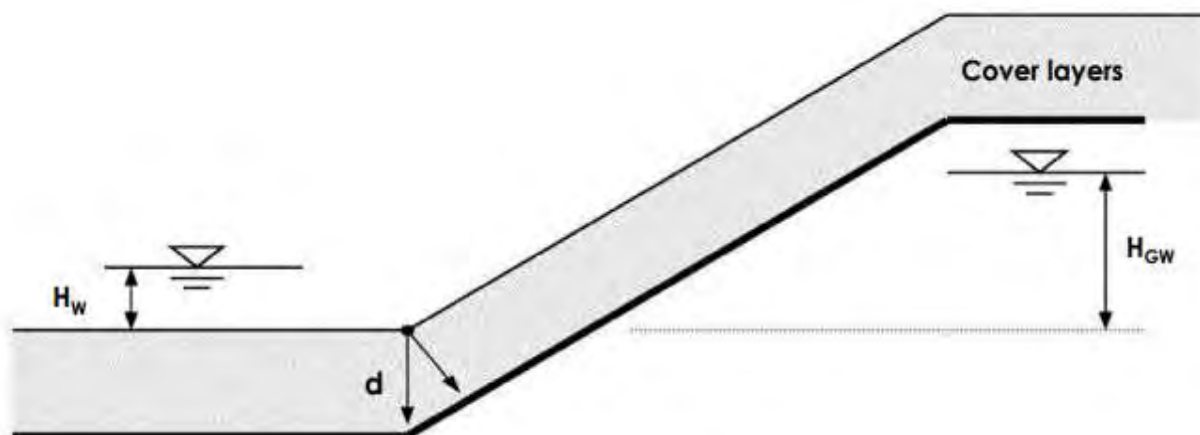
Degree of Utilisation is less than 1 therefore OK

0.3 m depth of soil on top of the liner is required

TUSCANY HOUSE, WHITE HART LANE, BASINGSTOKE, RG21 4AF

Project:	Bilsham Road, Yapton	Reference:	19-326
Purpose:	Flotation Calculations	Sheet No:	1 of 5
Calcs By:	JW	Date:	08/03/2021
Checked:	GG	Date:	09/03/2021

REF	CALCULATION	OUTPUT
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Attenuation Basin 4 Details

Basin Cover Level	4.999 mAOD
Basin Invert Level	3.249 mAOD
<u>Groundwater Level at Basin</u>	
WS 14	1.22 mbgl
Ground level at location of WS 14	4.85 mAOD
Groundwater level at location of WS 17	3.63 mAOD
Equivalent level of water if bgl value taken, below level at the basin	3.779 mAOD
Use the higher level of G38 or G40 cells	3.78 mAOD

Note: highest level
recorded

Water level in the pond above the sealing system	Hw =	0 m	Note: Basins normally dry
Groundwater Level above the pond surface	Hgw =	0.531 m	
Unit weight of water	Yw =	10 kN/m3	
Thickness of the cover layers above the sealing system	d =	0.55 m	
Unit weight of soil above the sealing system	Yb =	23 kN/m3	
Partial safety Factor (favourable, permanent loads)	Yg,stb =	0.95 -	
Partial safety Factor (unfavourable, permanent loads)	Yg,dst =	1.05 -	

Buoyancy force σ_a below the liner

$$\sigma_a = (H_{gw} + d) \cdot \gamma_w \cdot \gamma_{g,dst}$$

$$\sigma_{a,d} = 11.3505$$

Load σ_g above the liner

$$\sigma_{g,d} = (d \cdot \gamma_b + H_w \cdot \gamma_w) \cdot \gamma_{g,stb}$$

$$\sigma_{g,d} = 12.0175$$

This is the load from any permanent existing water in the basin and the soil

Degree of Utilisation

$$\mu = \sigma_{a,d} / \sigma_{g,d} \leq 1$$

$$\text{Degree of Utilisation} = 0.9445$$

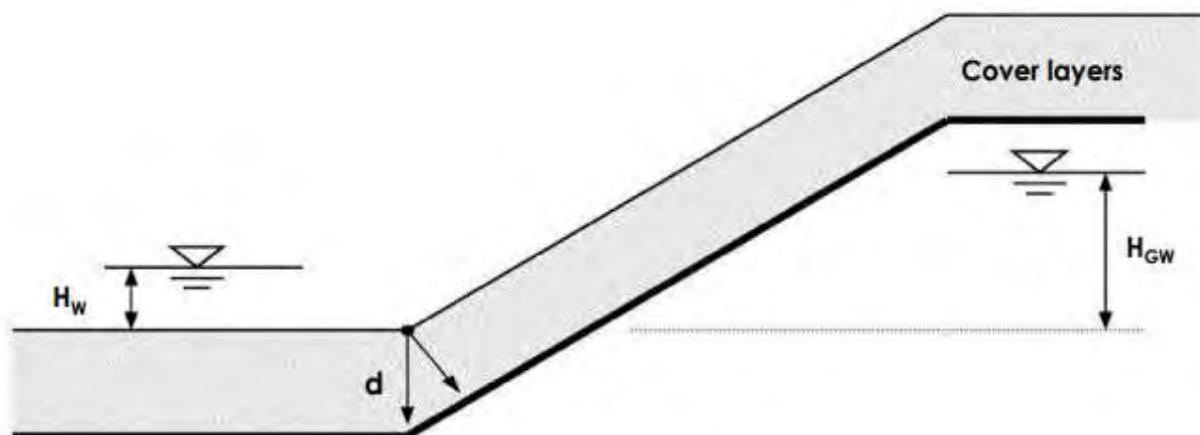
Degree of Utilisation is less than 1 therefore OK

0.55 m depth of soil on top of the liner is required

TUSCANY HOUSE, WHITE HART LANE, BASINGSTOKE, RG21 4AF

Project:	Bilsham Road, Yapton	Reference:	19-326
Purpose:	Flotation Calculations	Sheet No:	1 of 5
Calcs By:	JW	Date:	08/03/2021
Checked:	GG	Date:	09/03/2021

REF	CALCULATION	OUTPUT
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Attenuation Basin 5 Details

Basin Cover Level	5.188 mAOD
Basin Invert Level	3.388 mAOD
<u>Groundwater Level at Basin</u>	
WS 14	1.22 mbgl
Ground level at location of WS 14	4.85 mAOD
Groundwater level at location of WS 14	3.63 mAOD
Equivalent level of water if bgl value taken, below level at the basin	3.968 mAOD
Use the higher level of G38 or G40 cells	3.959 mAOD

Note: highest level
recorded

Water level in the pond above the sealing system	Hw =	0 m	Note: Basins normally dry
Groundwater Level above the pond surface	Hgw =	0.571 m	
Unit weight of water	Yw =	10 kN/m3	
Thickness of the cover layers above the sealing system	d =	0.6 m	
Unit weight of soil above the sealing system	Yb =	23 kN/m3	
Partial safety Factor (favourable, permanent loads)	Yg,stb =	0.95 -	
Partial safety Factor (unfavourable, permanent loads)	Yg,dst =	1.05 -	

Buoyancy force σ_a below the liner

$$\sigma_a = (H_{gw} + d) \cdot \gamma_w \cdot \gamma_{g,dst}$$

$$\sigma_{a,d} = 12.2955$$

Load σ_g above the liner

$$\sigma_{g,d} = (d \cdot \gamma_b + H_w \cdot \gamma_w) \cdot \gamma_{g,stb}$$

$$\sigma_{g,d} = 13.11$$

This is the load from any permanent existing water in the basin and the soil

Degree of Utilisation

$$\mu = \sigma_{a,d} / \sigma_{g,d} \leq 1$$

$$\text{Degree of Utilisation} = 0.93787$$

Degree of Utilisation is less than 1 therefore OK

0.6 m depth of soil on top of the liner is required

	Cover level (mAOD)	Invert level (mAOD)	Depth (m)	Borehole number	Cover level - Borehole location (mAOD)
Basin 1	6.001	4.201	1.8	WS 16	6.2
Basin 2	6.01	4.82	1.19	WS17	5.64
Basin 3	5.671	4.521	1.15	WS17	5.64
Basin 4	4.999	3.249	1.75	WS17	4.85
Basin 5	5.188	3.388	1.8	WS14 or WS17	4.85

Highest
groundwater
level in that
location

1.03

1.01

1.01

1.22

1.22

APPENDIX E

Exceedance Flow Routes

APPENDIX F

Impermeable Areas Catchment Plan

APPENDIX G

Operation and Maintenance Requirements for SuDS Features

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

22.13 REFERENCE

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Statutes

Reservoir Act 1975 (c.23)

Health and Safety at Work (etc) Act 1974 (c.37)

Building Act 1984 (c.55)

Flood and Water Management Act 2010 (c.29)

Construction (Design and Management) Regulations (CDM) 2015

TABLE 20.15 Operation and maintenance requirements for pervious pavements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Many of the specific maintenance activities for pervious pavements can be undertaken as part of a general site cleaning contract (many car parks or roads are swept to remove litter and for visual reasons to keep them tidy) and therefore, if litter management is already required at site, this should have marginal cost implications.

Generally, pervious pavements require less frequent gritting in winter to prevent ice formation. There is also less risk of ice formation after snow melt, as the melt water drains directly into the underlying sub-base and does not have chance to refreeze. A slight frost may occur more frequently on the surface of pervious pavements compared to adjacent impermeable surfaces, but this is only likely to last for a few hours. It does not happen in all installations and, if necessary, this can be dealt with by application of salt. It is not likely to pose a hazard to vehicle movements.

► Generic health and safety guidance is presented in **Chapter 36**.

CDM 2015 requires designers to ensure that all maintenance risks have been identified, eliminated, reduced and/or controlled where appropriate. This information will be required as part of the health and safety file.

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

21.14 REFERENCES

BARNES, G E (2010) *Soil mechanics: principles and practice, third edition*, Palgrave Macmillan, Hampshire, UK (ISBN: 978-0-23057-980-4)

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