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City Quadrant 11 Waterloo Square Newcastle upon Tyne N...		
Date 09/04/2015 12:33 File Rural.srcx	Designed By jsymmons Checked By	
XP Solutions	Source Control W.12.5	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	153.724	0.224	19.9	199.4	O K
30 min Summer	153.794	0.294	23.9	270.6	O K
60 min Summer	153.866	0.366	25.7	347.2	O K
120 min Summer	153.954	0.454	26.3	447.7	O K
180 min Summer	153.988	0.488	26.3	488.1	O K
240 min Summer	154.006	0.506	26.3	509.6	O K
360 min Summer	154.025	0.525	26.3	532.5	O K
480 min Summer	154.032	0.532	26.3	540.8	O K
600 min Summer	154.032	0.532	26.3	540.8	O K
720 min Summer	154.028	0.528	26.3	535.7	O K
960 min Summer	154.013	0.513	26.3	517.2	O K
1440 min Summer	153.972	0.472	26.3	468.1	O K
2160 min Summer	153.909	0.409	26.2	395.9	O K
2880 min Summer	153.857	0.357	25.6	338.1	O K
4320 min Summer	153.785	0.285	23.5	261.5	O K
5760 min Summer	153.742	0.242	21.3	217.4	O K
7200 min Summer	153.714	0.214	19.1	189.6	O K
8640 min Summer	153.694	0.194	17.4	170.5	O K
10080 min Summer	153.679	0.179	16.0	156.5	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	43.587	25
30 min Summer	30.568	39
60 min Summer	20.563	68
120 min Summer	13.351	128
180 min Summer	10.299	174
240 min Summer	8.545	208
360 min Summer	6.553	274
480 min Summer	5.421	342
600 min Summer	4.676	410
720 min Summer	4.143	476
960 min Summer	3.422	612
1440 min Summer	2.611	874
2160 min Summer	1.992	1244
2880 min Summer	1.644	1596
4320 min Summer	1.252	2300
5760 min Summer	1.032	3008
7200 min Summer	0.888	3744
8640 min Summer	0.785	4424
10080 min Summer	0.707	5152

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Winter	153.748	0.248	21.7	223.7	O K
30 min Winter	153.827	0.327	24.9	304.9	O K
60 min Winter	153.907	0.407	26.1	393.4	O K
120 min Winter	154.005	0.505	26.3	508.0	O K
180 min Winter	154.048	0.548	26.3	560.7	O K
240 min Winter	154.066	0.566	26.3	583.5	O K
360 min Winter	154.081	0.581	26.3	602.6	O K
480 min Winter	154.084	0.584	26.3	606.0	O K
600 min Winter	154.078	0.578	26.3	598.5	O K
720 min Winter	154.067	0.567	26.3	584.5	O K
960 min Winter	154.036	0.536	26.3	546.1	O K
1440 min Winter	153.964	0.464	26.3	458.7	O K
2160 min Winter	153.867	0.367	25.7	349.0	O K
2880 min Winter	153.800	0.300	24.1	277.1	O K
4320 min Winter	153.727	0.227	20.2	203.1	O K
5760 min Winter	153.691	0.191	17.1	167.8	O K
7200 min Winter	153.669	0.169	14.9	146.4	O K
8640 min Winter	153.653	0.153	13.3	131.6	O K
10080 min Winter	153.641	0.141	12.0	120.7	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Winter	43.587	25
30 min Winter	30.568	39
60 min Winter	20.563	68
120 min Winter	13.351	128
180 min Winter	10.299	180
240 min Winter	8.545	230
360 min Winter	6.553	292
480 min Winter	5.421	368
600 min Winter	4.676	442
720 min Winter	4.143	516
960 min Winter	3.422	660
1440 min Winter	2.611	928
2160 min Winter	1.992	1288
2880 min Winter	1.644	1644
4320 min Winter	1.252	2336
5760 min Winter	1.032	3016
7200 min Winter	0.888	3744
8640 min Winter	0.785	4424
10080 min Winter	0.707	5152

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	13.500	Shortest Storm (mins)	15
Ratio R	0.250	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time / Area Diagram

Total Area (ha) 2.900

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.500	12-16	0.000	24-28	0.000	36-40	0.000	48-52	0.000		
4-8	0.500	16-20	0.000	28-32	0.000	40-44	0.000	52-56	0.000		
8-12	1.600	20-24	0.000	32-36	0.000	44-48	0.000	56-60	0.300		

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Model Details

Storage is Online Cover Level (m) 155.000

Tank or Pond Structure


Invert Level (m) 153.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	800.0	1.500	2024.0

Hydro-Brake® Outflow Control

Design Head (m) 1.050 Diameter (mm) 213
Design Flow (l/s) 28.5 Invert Level (m) 153.500
Hydro-Brake® Type Md5 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6	1.200	30.2	3.000	47.3	7.000	72.2
0.200	17.9	1.400	32.4	3.500	51.1	7.500	74.8
0.300	24.1	1.600	34.6	4.000	54.6	8.000	77.2
0.400	26.1	1.800	36.6	4.500	57.9	8.500	79.6
0.500	26.2	2.000	38.6	5.000	61.1	9.000	81.9
0.600	25.9	2.200	40.5	5.500	64.0	9.500	84.2
0.800	26.4	2.400	42.3	6.000	66.9		
1.000	28.1	2.600	44.0	6.500	69.6		

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XP Solutions	Source Control W.12.5	

Summary of Results for 200 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	153.877	0.377	25.9	359.5	O K
30 min Summer	154.002	0.502	26.3	504.4	O K
60 min Summer	154.151	0.651	26.3	693.4	O K
120 min Summer	154.291	0.791	26.4	888.7	O K
180 min Summer	154.356	0.856	26.8	984.3	O K
240 min Summer	154.390	0.890	27.1	1034.6	O K
360 min Summer	154.418	0.918	27.3	1079.0	O K
480 min Summer	154.431	0.931	27.4	1098.8	O K
600 min Summer	154.436	0.936	27.5	1106.2	O K
720 min Summer	154.436	0.936	27.5	1106.3	O K
960 min Summer	154.427	0.927	27.4	1092.9	O K
1440 min Summer	154.393	0.893	27.1	1040.5	O K
2160 min Summer	154.329	0.829	26.6	944.0	O K
2880 min Summer	154.260	0.760	26.3	843.1	O K
4320 min Summer	154.117	0.617	26.3	649.2	O K
5760 min Summer	153.990	0.490	26.3	490.2	O K
7200 min Summer	153.896	0.396	26.1	380.4	O K
8640 min Summer	153.833	0.333	25.0	311.4	O K
10080 min Summer	153.790	0.290	23.7	266.6	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	77.822	26
30 min Summer	55.454	40
60 min Summer	37.553	96
120 min Summer	24.127	132
180 min Summer	18.463	188
240 min Summer	15.216	244
360 min Summer	11.546	328
480 min Summer	9.474	392
600 min Summer	8.120	458
720 min Summer	7.155	526
960 min Summer	5.856	664
1440 min Summer	4.412	940
2160 min Summer	3.324	1348
2880 min Summer	2.717	1740
4320 min Summer	2.041	2480
5760 min Summer	1.664	3176
7200 min Summer	1.420	3832
8640 min Summer	1.246	4512
10080 min Summer	1.116	5248

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Summary of Results for 200 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Winter	153.917	0.417	26.2	404.1	O K
30 min Winter	154.054	0.554	26.3	569.0	O K
60 min Winter	154.218	0.718	26.3	785.0	O K
120 min Winter	154.367	0.867	26.9	1000.7	O K
180 min Winter	154.444	0.944	27.5	1118.9	O K
240 min Winter	154.485	0.985	27.9	1183.5	O K
360 min Winter	154.522	1.022	28.3	1243.6	O K
480 min Winter	154.532	1.032	28.4	1259.6	O K
600 min Winter	154.534	1.034	28.4	1264.2	O K
720 min Winter	154.532	1.032	28.4	1260.7	O K
960 min Winter	154.516	1.016	28.2	1233.8	O K
1440 min Winter	154.459	0.959	27.7	1142.5	O K
2160 min Winter	154.354	0.854	26.8	980.3	O K
2880 min Winter	154.240	0.740	26.3	815.2	O K
4320 min Winter	154.010	0.510	26.3	514.1	O K
5760 min Winter	153.855	0.355	25.5	334.9	O K
7200 min Winter	153.777	0.277	23.2	252.8	O K
8640 min Winter	153.736	0.236	20.8	211.3	O K
10080 min Winter	153.710	0.210	18.8	186.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Winter	77.822	26
30 min Winter	55.454	81
60 min Winter	37.553	100
120 min Winter	24.127	132
180 min Winter	18.463	186
240 min Winter	15.216	240
360 min Winter	11.546	348
480 min Winter	9.474	442
600 min Winter	8.120	486
720 min Winter	7.155	562
960 min Winter	5.856	718
1440 min Winter	4.412	1018
2160 min Winter	3.324	1456
2880 min Winter	2.717	1856
4320 min Winter	2.041	2564
5760 min Winter	1.664	3184
7200 min Winter	1.420	3824
8640 min Winter	1.246	4504
10080 min Winter	1.116	5208

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Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	13.500	Shortest Storm (mins)	15
Ratio R	0.250	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time / Area Diagram

Total Area (ha) 2.900

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0-4	0.500	12-16	0.000	24-28	0.000	36-40	0.000	48-52	0.000		
4-8	0.500	16-20	0.000	28-32	0.000	40-44	0.000	52-56	0.000		
8-12	1.600	20-24	0.000	32-36	0.000	44-48	0.000	56-60	0.300		

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 Design Flow (l/s) 28.5 Invert Level (m) 153.500
 Hydro-Brake® Type Md5 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6	1.200	30.2	3.000	47.3	7.000	72.2
0.200	17.9	1.400	32.4	3.500	51.1	7.500	74.8
0.300	24.1	1.600	34.6	4.000	54.6	8.000	77.2
0.400	26.1	1.800	36.6	4.500	57.9	8.500	79.6
0.500	26.2	2.000	38.6	5.000	61.1	9.000	81.9
0.600	25.9	2.200	40.5	5.500	64.0	9.500	84.2
0.800	26.4	2.400	42.3	6.000	66.9		
1.000	28.1	2.600	44.0	6.500	69.6		