

Betts Associates Ltd				Page 1																																																																																																																																																																																																																			
Old Marsh Farm Barns Welsh Road Sealand Flintshire CH5 2LY		Old Foundry Wrexham SG Estates																																																																																																																																																																																																																					
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Summary of Results for 100 year Return Period (+30%) Half Drain Time : 48 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>107.517</td><td>1.096</td><td>2.6</td><td>9.8</td><td>0 K</td></tr><tr><td>30 min Summer</td><td>107.846</td><td>1.425</td><td>3.0</td><td>12.7</td><td>0 K</td></tr><tr><td>60 min Summer</td><td>108.066</td><td>1.645</td><td>3.2</td><td>14.7</td><td>0 K</td></tr><tr><td>120 min Summer</td><td>108.143</td><td>1.722</td><td>3.3</td><td>15.4</td><td>0 K</td></tr><tr><td>180 min Summer</td><td>108.094</td><td>1.673</td><td>3.3</td><td>14.9</td><td>0 K</td></tr><tr><td>240 min Summer</td><td>108.016</td><td>1.595</td><td>3.2</td><td>14.2</td><td>0 K</td></tr><tr><td>360 min Summer</td><td>107.860</td><td>1.439</td><td>3.0</td><td>12.8</td><td>0 K</td></tr><tr><td>480 min 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Volume (m³)	Status	15 min Summer	107.517	1.096	2.6	9.8	0 K	30 min Summer	107.846	1.425	3.0	12.7	0 K	60 min Summer	108.066	1.645	3.2	14.7	0 K	120 min Summer	108.143	1.722	3.3	15.4	0 K	180 min Summer	108.094	1.673	3.3	14.9	0 K	240 min Summer	108.016	1.595	3.2	14.2	0 K	360 min Summer	107.860	1.439	3.0	12.8	0 K	480 min Summer	107.717	1.296	2.8	11.6	0 K	600 min Summer	107.589	1.168	2.6	10.4	0 K	720 min Summer	107.474	1.053	2.5	9.4	0 K	960 min Summer	107.281	0.860	2.3	7.7	0 K	1440 min Summer	106.997	0.576	1.9	5.1	0 K	2160 min Summer	106.725	0.304	1.6	2.7	0 K	2880 min Summer	106.560	0.139	1.4	1.2	0 K	4320 min Summer	106.465	0.044	1.1	0.4	0 K	5760 min Summer	106.456	0.035	0.9	0.3	0 K	7200 min Summer	106.451	0.030	0.8	0.3	0 K	8640 min Summer	106.447	0.026	0.7	0.2	0 K	10080 min Summer	106.444	0.023	0.6	0.2	0 K	15 min Winter	107.663	1.242	2.7	11.1	0 K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	102.843	0.0	22	30 min Summer	71.174	0.0	33	60 min 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Micro Drainage		Source Control 2014.1.1

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	108.044	1.623	3.2	14.5	0 K
60 min Winter	108.301	1.880	3.5	16.8	Flood Risk
120 min Winter	108.367	1.946	3.6	17.4	Flood Risk
180 min Winter	108.273	1.852	3.5	16.5	Flood Risk
240 min Winter	108.140	1.719	3.3	15.3	0 K
360 min Winter	107.898	1.477	3.0	13.2	0 K
480 min Winter	107.691	1.270	2.8	11.3	0 K
600 min Winter	107.513	1.092	2.6	9.8	0 K
720 min Winter	107.362	0.941	2.4	8.4	0 K
960 min Winter	107.119	0.698	2.1	6.2	0 K
1440 min Winter	106.788	0.367	1.7	3.3	0 K
2160 min Winter	106.508	0.087	1.3	0.8	0 K
2880 min Winter	106.464	0.043	1.1	0.4	0 K
4320 min Winter	106.453	0.032	0.8	0.3	0 K
5760 min Winter	106.447	0.026	0.7	0.2	0 K
7200 min Winter	106.443	0.022	0.6	0.2	0 K
8640 min Winter	106.440	0.019	0.5	0.2	0 K
10080 min Winter	106.438	0.017	0.4	0.2	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	71.174	0.0	34
60 min Winter	47.182	0.0	56
120 min Winter	30.215	0.0	92
180 min Winter	22.902	0.0	130
240 min Winter	18.651	0.0	166
360 min Winter	13.921	0.0	234
480 min Winter	11.303	0.0	302
600 min Winter	9.607	0.0	368
720 min Winter	8.406	0.0	432
960 min Winter	6.800	0.0	558
1440 min Winter	5.032	0.0	800
2160 min Winter	3.713	0.0	1136
2880 min Winter	2.987	0.0	1452
4320 min Winter	2.194	0.0	2200
5760 min Winter	1.763	0.0	2904
7200 min Winter	1.489	0.0	3544
8640 min Winter	1.298	0.0	4296
10080 min Winter	1.155	0.0	5064

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.296	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.063

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.021		4 8 0.021		8 12 0.021	

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<u>Model Details</u> Storage is Online Cover Level (m) 108.530 <u>Lined Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.54000</td> <td>Ring Diameter (m)</td> <td>2.70</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.54000</td> <td>Pit Multiplier</td> <td>1.5</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Number Required</td> <td>1</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.000</td> </tr> <tr> <td>Invert Level (m)</td> <td>106.421</td> <td>Cap Infiltration Depth (m)</td> <td>0.000</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.54000	Ring Diameter (m)	2.70	Infiltration Coefficient Side (m/hr)	0.54000	Pit Multiplier	1.5	Safety Factor	2.0	Number Required	1	Porosity	0.30	Cap Volume Depth (m)	0.000	Invert Level (m)	106.421	Cap Infiltration Depth (m)	0.000
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