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5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	SOAKAWAY CALCULATIONS SOUTH-EAST CORNER HEATON AVE, CLECKHEATON	
Date DEC 2017 File H17074-R1 SOAKAWAY DESI...	Designed by TB Checked by	
XP Solutions	Source Control 2016.1	

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 54 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	124.779	1.179	0.6	2.1	O K
30 min Summer	125.293	1.693	0.6	2.6	O K
60 min Summer	125.578	1.978	0.6	2.9	O K
120 min Summer	125.580	1.980	0.6	2.9	O K
180 min Summer	125.404	1.804	0.6	2.7	O K
240 min Summer	125.186	1.586	0.6	2.5	O K
360 min Summer	124.769	1.169	0.6	2.1	O K
480 min Summer	124.404	0.804	0.6	1.7	O K
600 min Summer	124.107	0.507	0.6	1.4	O K
720 min Summer	123.970	0.370	0.5	1.2	O K
960 min Summer	123.880	0.280	0.5	0.9	O K
1440 min Summer	123.759	0.159	0.4	0.5	O K
2160 min Summer	123.665	0.065	0.3	0.2	O K
2880 min Summer	123.644	0.044	0.3	0.1	O K
4320 min Summer	123.632	0.032	0.2	0.1	O K
5760 min Summer	123.625	0.025	0.2	0.1	O K
7200 min Summer	123.621	0.021	0.1	0.1	O K
8640 min Summer	123.619	0.019	0.1	0.1	O K
10080 min Summer	123.616	0.016	0.1	0.1	O K
15 min Winter	125.077	1.477	0.6	2.4	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	122.736	0.0	17
30 min Summer	83.131	0.0	31
60 min Summer	53.779	0.0	50
120 min Summer	33.582	0.0	84
180 min Summer	25.102	0.0	118
240 min Summer	20.261	0.0	152
360 min Summer	14.960	0.0	218
480 min Summer	12.053	0.0	278
600 min Summer	10.184	0.0	338
720 min Summer	8.869	0.0	396
960 min Summer	7.123	0.0	518
1440 min Summer	5.219	0.0	754
2160 min Summer	3.815	0.0	1104
2880 min Summer	3.051	0.0	1464
4320 min Summer	2.221	0.0	2156
5760 min Summer	1.771	0.0	2864
7200 min Summer	1.487	0.0	3560
8640 min Summer	1.289	0.0	4352
10080 min Summer	1.143	0.0	4968
15 min Winter	122.736	0.0	17

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	125.697	2.097	0.6	3.0	O K
60 min Winter	126.053	2.453	0.6	3.4	Flood Risk
120 min Winter	126.013	2.413	0.6	3.3	Flood Risk
180 min Winter	125.723	2.123	0.6	3.1	O K
240 min Winter	125.373	1.773	0.6	2.7	O K
360 min Winter	124.719	1.119	0.6	2.0	O K
480 min Winter	124.192	0.592	0.6	1.5	O K
600 min Winter	123.960	0.360	0.5	1.2	O K
720 min Winter	123.892	0.292	0.5	1.0	O K
960 min Winter	123.789	0.189	0.4	0.6	O K
1440 min Winter	123.666	0.066	0.3	0.2	O K
2160 min Winter	123.639	0.039	0.2	0.1	O K
2880 min Winter	123.631	0.031	0.2	0.1	O K
4320 min Winter	123.623	0.023	0.1	0.1	O K
5760 min Winter	123.618	0.018	0.1	0.1	O K
7200 min Winter	123.615	0.015	0.1	0.1	O K
8640 min Winter	123.613	0.013	0.1	0.0	O K
10080 min Winter	123.612	0.012	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	83.131	0.0	31
60 min Winter	53.779	0.0	56
120 min Winter	33.582	0.0	92
180 min Winter	25.102	0.0	128
240 min Winter	20.261	0.0	164
360 min Winter	14.960	0.0	230
480 min Winter	12.053	0.0	290
600 min Winter	10.184	0.0	348
720 min Winter	8.869	0.0	410
960 min Winter	7.123	0.0	530
1440 min Winter	5.219	0.0	762
2160 min Winter	3.815	0.0	1076
2880 min Winter	3.051	0.0	1468
4320 min Winter	2.221	0.0	2200
5760 min Winter	1.771	0.0	2888
7200 min Winter	1.487	0.0	3672
8640 min Winter	1.289	0.0	4240
10080 min Winter	1.143	0.0	5136

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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)	19.000	Shortest Storm (mins)	15
Ratio R	0.335	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.011

Time (mins)		Area
From:	To:	(ha)
0	4	0.011

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Model Details

Storage is Online Cover Level (m) 126.200

Cellular Storage Structure

Invert Level (m) 123.600 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.57600 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.57600

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	3.5	3.5	0.401	0.0	7.1
0.400	3.5	7.1			