Date 12/12/2019 14:35	Designed by Arwyn
File Green roof calc 1 in 10...	Checked by
Innovyze	Source Control 2017.1

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

Half Drain Time : 1588 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	9.826	0.076	0.0	0.0	0.0	7.3	O K
30 min Summer	9.854	0.104	0.0	0.0	0.0	9.9	O K
60 min Summer	9.881	0.131	0.0	0.0	0.0	12.6	O K
120 min Summer	9.909	0.159	0.0	0.0	0.0	15.2	O K
180 min Summer	9.924	0.174	0.0	0.0	0.0	16.7	O K
240 min Summer	9.935	0.185	0.0	0.0	0.0	17.7	O K
360 min Summer	9.951	0.201	0.0	0.0	0.0	19.3	Flood Risk
480 min Summer	9.963	0.213	0.0	0.0	0.0	20.4	Flood Risk
600 min Summer	9.972	0.222	0.0	0.0	0.0	21.3	Flood Risk
720 min Summer	9.980	0.230	0.0	0.0	0.0	22.0	Flood Risk
960 min Summer	9.987	0.237	0.0	0.1	0.1	22.7	Flood Risk
1440 min Summer	9.989	0.239	0.0	0.1	0.1	22.9	Flood Risk
2160 min Summer	9.989	0.239	0.0	0.1	0.1	22.9	Flood Risk
2880 min Summer	9.990	0.240	0.0	0.1	0.1	22.9	Flood Risk
4320 min Summer	9.990	0.240	0.0	0.1	0.1	23.0	Flood Risk
5760 min Summer	9.990	0.240	0.0	0.1	0.1	22.9	Flood Risk
7200 min Summer	9.989	0.239	0.0	0.1	0.1	22.9	Flood Risk
8640 min Summer	9.989	0.239	0.0	0.1	0.1	22.8	Flood Risk
10080 min Summer	9.988	0.238	0.0	0.1	0.1	22.7	Flood Risk
15 min Winter	9.837	0.087	0.0	0.0	0.0	8.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	149.936	0.0	0.0	128
30 min Summer	96.960	0.0	0.0	137
60 min Summer	59.609	0.0	0.0	158
120 min Summer	35.379	0.0	0.0	206
180 min Summer	25.731	0.0	0.0	260
240 min Summer	20.411	0.0	0.0	314
360 min Summer	14.730	0.0	0.0	428
480 min Summer	11.676	0.0	0.0	544
600 min Summer	9.744	0.0	0.0	660
720 min Summer	8.402	0.0	0.4	762
960 min Summer	6.645	0.0	1.5	970
1440 min Summer	4.769	0.0	3.1	1358
2160 min Summer	3.417	0.0	4.8	1688
2880 min Summer	2.695	0.0	5.8	2040
4320 min Summer	1.926	0.0	7.0	2816
5760 min Summer	1.517	0.0	7.9	3640
7200 min Summer	1.260	0.0	8.2	4464
8640 min Summer	1.082	0.0	8.4	5272
10080 min Summer	0.951	0.0	8.3	6096
15 min Winter	149.936	0.0	0.0	128

Date 12/12/2019 14:35	Designed by Arwyn
File Green roof calc 1 in 10...	Checked by
Innovyze	Source Control 2017.1

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	9.868	0.118	0.0	0.0	0.0	11.3	O K
60 min Winter	9.899	0.149	0.0	0.0	0.0	14.3	O K
120 min Winter	9.930	0.180	0.0	0.0	0.0	17.2	O K
180 min Winter	9.948	0.198	0.0	0.0	0.0	18.9	O K
240 min Winter	9.960	0.210	0.0	0.0	0.0	20.1	Flood Risk
360 min Winter	9.978	0.228	0.0	0.0	0.0	21.8	Flood Risk
480 min Winter	9.988	0.238	0.0	0.1	0.1	22.8	Flood Risk
600 min Winter	9.993	0.243	0.0	0.2	0.2	23.3	Flood Risk
720 min Winter	9.995	0.245	0.0	0.2	0.2	23.5	Flood Risk
960 min Winter	9.996	0.246	0.0	0.2	0.2	23.5	Flood Risk
1440 min Winter	9.997	0.247	0.0	0.2	0.2	23.6	Flood Risk
2160 min Winter	9.998	0.248	0.0	0.2	0.2	23.7	Flood Risk
2880 min Winter	9.997	0.247	0.0	0.2	0.2	23.7	Flood Risk
4320 min Winter	9.996	0.246	0.0	0.2	0.2	23.5	Flood Risk
5760 min Winter	9.994	0.244	0.0	0.2	0.2	23.4	Flood Risk
7200 min Winter	9.993	0.243	0.0	0.2	0.2	23.2	Flood Risk
8640 min Winter	9.992	0.242	0.0	0.1	0.1	23.1	Flood Risk
10080 min Winter	9.991	0.241	0.0	0.1	0.1	23.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	96.960	0.0	0.0	138
60 min Winter	59.609	0.0	0.0	160
120 min Winter	35.379	0.0	0.0	206
180 min Winter	25.731	0.0	0.0	260
240 min Winter	20.411	0.0	0.0	314
360 min Winter	14.730	0.0	0.2	418
480 min Winter	11.676	0.0	1.5	494
600 min Winter	9.744	0.0	2.5	596
720 min Winter	8.402	0.0	3.3	700
960 min Winter	6.645	0.0	4.6	880
1440 min Winter	4.769	0.0	6.4	1078
2160 min Winter	3.417	0.0	8.4	1500
2880 min Winter	2.695	0.0	9.6	1920
4320 min Winter	1.926	0.0	11.1	2748
5760 min Winter	1.517	0.0	12.1	3552
7200 min Winter	1.260	0.0	12.7	4392
8640 min Winter	1.082	0.0	12.9	5192
10080 min Winter	0.951	0.0	13.0	6048

Date 12/12/2019 14:35	Designed by Arwyn
File Green roof calc 1 in 10...	Checked by
Innovyze	Source Control 2017.1

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)	21.000	Shortest Storm (mins)	15
Ratio R	0.434	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Green Roof

Area (m^3)	319	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.005797	32	36	0.001170	64	68	0.000236	96	100	0.000048
4	8	0.004746	36	40	0.000958	68	72	0.000193	100	104	0.000039
8	12	0.003886	40	44	0.000785	72	76	0.000158	104	108	0.000032
12	16	0.003181	44	48	0.000642	76	80	0.000130	108	112	0.000026
16	20	0.002605	48	52	0.000526	80	84	0.000106	112	116	0.000021
20	24	0.002133	52	56	0.000431	84	88	0.000087	116	120	0.000018
24	28	0.001746	56	60	0.000353	88	92	0.000071			
28	32	0.001429	60	64	0.000289	92	96	0.000058			

Date 12/12/2019 14:35	Designed by Arwyn
File Green roof calc 1 in 10...	Checked by
Innovyze	Source Control 2017.1

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.750 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	319.0	0.0	0.250	319.0	0.0

Orifice Outflow Control

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.975