

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

Half Drain Time : 17 minutes.


Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m ³)	Status
15 min Summer	50.692	0.192	0.0	35.0	35.0	36.1	O K
30 min Summer	50.722	0.222	0.0	35.0	35.0	41.6	Flood Risk
60 min Summer	50.719	0.219	0.0	35.0	35.0	41.0	Flood Risk
120 min Summer	50.703	0.203	0.0	35.0	35.0	38.1	Flood Risk
180 min Summer	50.682	0.182	0.0	35.0	35.0	34.1	O K
240 min Summer	50.660	0.160	0.0	31.6	31.6	30.0	O K
360 min Summer	50.627	0.127	0.0	25.8	25.8	23.7	O K
480 min Summer	50.604	0.104	0.0	21.8	21.8	19.4	O K
600 min Summer	50.586	0.086	0.0	18.9	18.9	16.2	O K
720 min Summer	50.573	0.073	0.0	16.7	16.7	13.7	O K
960 min Summer	50.552	0.052	0.0	13.6	13.6	9.8	O K
1440 min Summer	50.525	0.025	0.0	10.3	10.3	4.7	O K
2160 min Summer	50.507	0.007	0.0	7.7	7.7	1.3	O K
2880 min Summer	50.500	0.000	0.0	6.2	6.2	0.0	O K
4320 min Summer	50.500	0.000	0.0	4.5	4.5	0.0	O K
5760 min Summer	50.500	0.000	0.0	3.5	3.5	0.0	O K
7200 min Summer	50.500	0.000	0.0	2.9	2.9	0.0	O K
8640 min Summer	50.500	0.000	0.0	2.5	2.5	0.0	O K
10080 min Summer	50.500	0.000	0.0	2.2	2.2	0.0	O K
15 min Winter	50.718	0.218	0.0	35.0	35.0	40.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	139.894	0.0	75.7	21
30 min Summer	90.253	0.0	97.1	27
60 min Summer	55.351	0.0	117.6	44
120 min Summer	32.779	0.0	144.8	84
180 min Summer	23.815	0.0	159.4	112
240 min Summer	18.879	0.0	169.4	142
360 min Summer	13.605	0.0	183.4	204
480 min Summer	10.775	0.0	193.8	264
600 min Summer	8.987	0.0	202.0	326
720 min Summer	7.745	0.0	208.7	386
960 min Summer	6.121	0.0	220.0	510
1440 min Summer	4.387	0.0	236.0	748
2160 min Summer	3.141	0.0	252.7	1108
2880 min Summer	2.475	0.0	264.6	0
4320 min Summer	1.768	0.0	281.4	0
5760 min Summer	1.391	0.0	293.1	0
7200 min Summer	1.155	0.0	301.9	0
8640 min Summer	0.991	0.0	308.9	0
10080 min Summer	0.871	0.0	314.4	0
15 min Winter	139.894	0.0	83.1	22

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m ³)	Status
30 min Winter	50.783	0.283	0.0	35.0	35.0	53.1	Flood Risk
60 min Winter	50.782	0.282	0.0	35.0	35.0	52.9	Flood Risk
120 min Winter	50.726	0.226	0.0	35.0	35.0	42.4	Flood Risk
180 min Winter	50.675	0.175	0.0	34.2	34.2	32.8	O K
240 min Winter	50.645	0.145	0.0	29.0	29.0	27.3	O K
360 min Winter	50.607	0.107	0.0	22.3	22.3	20.0	O K
480 min Winter	50.582	0.082	0.0	18.2	18.2	15.5	O K
600 min Winter	50.565	0.065	0.0	15.4	15.4	12.2	O K
720 min Winter	50.551	0.051	0.0	13.4	13.4	9.5	O K
960 min Winter	50.529	0.029	0.0	10.8	10.8	5.4	O K
1440 min Winter	50.508	0.008	0.0	7.8	7.8	1.5	O K
2160 min Winter	50.500	0.000	0.0	5.7	5.7	0.0	O K
2880 min Winter	50.500	0.000	0.0	4.5	4.5	0.0	O K
4320 min Winter	50.500	0.000	0.0	3.2	3.2	0.0	O K
5760 min Winter	50.500	0.000	0.0	2.5	2.5	0.0	O K
7200 min Winter	50.500	0.000	0.0	2.1	2.1	0.0	O K
8640 min Winter	50.500	0.000	0.0	1.8	1.8	0.0	O K
10080 min Winter	50.500	0.000	0.0	1.6	1.6	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
30 min Winter	90.253	0.0	110.7	34
60 min Winter	55.351	0.0	135.3	52
120 min Winter	32.779	0.0	164.4	88
180 min Winter	23.815	0.0	179.8	114
240 min Winter	18.879	0.0	190.4	146
360 min Winter	13.605	0.0	206.0	208
480 min Winter	10.775	0.0	217.7	270
600 min Winter	8.987	0.0	226.9	330
720 min Winter	7.745	0.0	234.6	394
960 min Winter	6.121	0.0	247.1	512
1440 min Winter	4.387	0.0	265.3	758
2160 min Winter	3.141	0.0	284.1	0
2880 min Winter	2.475	0.0	297.7	0
4320 min Winter	1.768	0.0	316.8	0
5760 min Winter	1.391	0.0	330.3	0
7200 min Winter	1.155	0.0	340.5	0
8640 min Winter	0.991	0.0	348.6	0
10080 min Winter	0.871	0.0	355.2	0

Ardent Consulting Engineers		Page 3
4th Floor, Diamond House 36-38 Hatton Garden London EC1N 8EB		
Date 22/12/2017 19:24 File Southern Permeable Pavi...	Designed by JChinnock Checked by	
Micro Drainage		Source Control 2017.1.2

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	0.440	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Pipe Network

Volume in Pipe Network (m³)	20	Dia of Outfall Pipe (m)	0.2
Slope of Outfall Pipe (1:X)	150	Roughness of Outfall Pipe (mm)	0.001

Time Area Diagram


Total Area (ha) 0.278

Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:
0	4 0.139	4	8 0.139

Green Roof

Area (m³)	305	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:	From:	To:
0	4 0.005542	32	36 0.001119	64	68 0.000226	96	100 0.000046
4	8 0.004538	36	40 0.000916	68	72 0.000185	100	104 0.000037
8	12 0.003715	40	44 0.000750	72	76 0.000151	104	108 0.000031
12	16 0.003042	44	48 0.000614	76	80 0.000124	108	112 0.000025
16	20 0.002490	48	52 0.000503	80	84 0.000102	112	116 0.000020
20	24 0.002039	52	56 0.000412	84	88 0.000083	116	120 0.000017
24	28 0.001669	56	60 0.000337	88	92 0.000068		
28	32 0.001367	60	64 0.000276	92	96 0.000056		

Ardent Consulting Engineers		Page 4
4th Floor, Diamond House 36-38 Hatton Garden London EC1N 8EB		
Date 22/12/2017 19:24 File Southern Permeable Pavi...	Designed by JChinnock Checked by	
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Model Details

Storage is Online Cover Level (m) 51.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	25.0
Membrane Percolation (mm/hr)	1000	Length (m)	25.0
Max Percolation (l/s)	173.6	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	50.500	Cap Volume Depth (m)	0.350

Hydroslide Outflow Control

Design Head (m)	2.000	Invert Level (m)	50.400
Design Flow (l/s)	35.0	Maximum Head (m)	2.700
Range	VS	Minimum Pipe Diameter (mm)	200
Application	Stormwater	Minimum Manhole Diameter (mm)	1800
Model	DR 200 VS		

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	35.0	3.000	36.8	7.000	56.2
0.200	21.2	1.400	35.0	3.500	39.7	7.500	58.2
0.300	35.0	1.600	35.0	4.000	42.5	8.000	60.1
0.400	35.0	1.800	35.0	4.500	45.1	8.500	61.9
0.500	35.0	2.000	35.0	5.000	47.5	9.000	63.7
0.600	35.0	2.200	31.5	5.500	49.8	9.500	65.5
0.800	35.0	2.400	32.9	6.000	52.0		
1.000	35.0	2.600	34.2	6.500	54.1		