

Nanjerrick Court  
 Allet  
 Truro, TR4 9DJ



Date 19/10/2022 15:12  
 File SWALE FOR AREAS 1 AND

Designed by hsh  
 Checked by

Innovyze Source Control 2020.1.3

Summary of Results for 100 year Return Period (+50%)

Half Drain Time : 149 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	99.878	0.278	0.0	0.7	0.7	5.7	Flood Risk
30 min Summer	99.922	0.322	0.0	0.7	0.7	7.5	Flood Risk
60 min Summer	99.952	0.352	0.0	0.7	0.7	8.9	Flood Risk
120 min Summer	99.961	0.361	0.0	0.7	0.7	9.3	Flood Risk
180 min Summer	99.954	0.354	0.0	0.7	0.7	8.9	Flood Risk
240 min Summer	99.945	0.345	0.0	0.7	0.7	8.5	Flood Risk
360 min Summer	99.929	0.329	0.0	0.7	0.7	7.8	Flood Risk
480 min Summer	99.912	0.312	0.0	0.7	0.7	7.1	Flood Risk
600 min Summer	99.895	0.295	0.0	0.7	0.7	6.4	Flood Risk
720 min Summer	99.877	0.277	0.0	0.7	0.7	5.7	Flood Risk
960 min Summer	99.836	0.236	0.0	0.7	0.7	4.3	Flood Risk
1440 min Summer	99.762	0.162	0.0	0.7	0.7	2.2	Flood Risk
2160 min Summer	99.685	0.085	0.0	0.7	0.7	0.7	O K
2880 min Summer	99.659	0.059	0.0	0.6	0.6	0.4	O K
4320 min Summer	99.643	0.043	0.0	0.4	0.4	0.2	O K
5760 min Summer	99.636	0.036	0.0	0.3	0.3	0.2	O K
7200 min Summer	99.632	0.032	0.0	0.3	0.3	0.1	O K
8640 min Summer	99.629	0.029	0.0	0.2	0.2	0.1	O K
10080 min Summer	99.627	0.027	0.0	0.2	0.2	0.1	O K
15 min Winter	99.899	0.299	0.0	0.7	0.7	6.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	148.021	0.0	6.9	35
30 min Summer	97.184	0.0	9.1	47
60 min Summer	60.764	0.0	11.4	72
120 min Summer	36.692	0.0	13.8	122
180 min Summer	26.945	0.0	15.2	156
240 min Summer	21.513	0.0	16.1	188
360 min Summer	15.627	0.0	17.6	256
480 min Summer	12.453	0.0	18.7	324
600 min Summer	10.434	0.0	19.6	392
720 min Summer	9.026	0.0	20.3	460
960 min Summer	7.175	0.0	21.5	582
1440 min Summer	5.185	0.0	23.3	808
2160 min Summer	3.740	0.0	25.2	1128
2880 min Summer	2.963	0.0	26.7	1472
4320 min Summer	2.131	0.0	28.8	2192
5760 min Summer	1.686	0.0	30.3	2936
7200 min Summer	1.404	0.0	31.6	3624
8640 min Summer	1.209	0.0	32.6	4336
10080 min Summer	1.065	0.0	33.6	5104
15 min Winter	148.021	0.0	7.8	35

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Summary of Results for 100 year Return Period (+50%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	99.946	0.346	0.0	0.7	0.7	8.6	Flood Risk
60 min Winter	99.980	0.380	0.0	0.7	0.7	10.2	Flood Risk
120 min Winter	99.993	0.393	0.0	0.7	0.7	10.9	Flood Risk
180 min Winter	99.986	0.386	0.0	0.7	0.7	10.5	Flood Risk
240 min Winter	99.976	0.376	0.0	0.7	0.7	10.0	Flood Risk
360 min Winter	99.954	0.354	0.0	0.7	0.7	8.9	Flood Risk
480 min Winter	99.930	0.330	0.0	0.7	0.7	7.9	Flood Risk
600 min Winter	99.906	0.306	0.0	0.7	0.7	6.8	Flood Risk
720 min Winter	99.878	0.278	0.0	0.7	0.7	5.7	Flood Risk
960 min Winter	99.811	0.211	0.0	0.7	0.7	3.5	Flood Risk
1440 min Winter	99.698	0.098	0.0	0.7	0.7	0.9	O K
2160 min Winter	99.654	0.054	0.0	0.5	0.5	0.3	O K
2880 min Winter	99.643	0.043	0.0	0.4	0.4	0.2	O K
4320 min Winter	99.633	0.033	0.0	0.3	0.3	0.1	O K
5760 min Winter	99.629	0.029	0.0	0.2	0.2	0.1	O K
7200 min Winter	99.626	0.026	0.0	0.2	0.2	0.1	O K
8640 min Winter	99.624	0.024	0.0	0.2	0.2	0.1	O K
10080 min Winter	99.622	0.022	0.0	0.2	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	97.184	0.0	10.2	48
60 min Winter	60.764	0.0	12.8	72
120 min Winter	36.692	0.0	15.4	122
180 min Winter	26.945	0.0	17.0	170
240 min Winter	21.513	0.0	18.1	200
360 min Winter	15.627	0.0	19.7	276
480 min Winter	12.453	0.0	20.9	350
600 min Winter	10.434	0.0	21.9	424
720 min Winter	9.026	0.0	22.7	496
960 min Winter	7.175	0.0	24.1	610
1440 min Winter	5.185	0.0	26.1	800
2160 min Winter	3.740	0.0	28.3	1112
2880 min Winter	2.963	0.0	29.9	1444
4320 min Winter	2.131	0.0	32.2	2204
5760 min Winter	1.686	0.0	34.0	2864
7200 min Winter	1.404	0.0	35.4	3584
8640 min Winter	1.209	0.0	36.6	4352
10080 min Winter	1.065	0.0	37.6	4984

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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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+50

Time Area Diagram

Total Area (ha) 0.025

Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)
0	4	0.004	8	12	0.004	16	20	0.004
4	8	0.004	12	16	0.004	20	24	0.005

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Model Details

Storage is Online Cover Level (m) 100.000

Swale Structure

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	15.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	4.0
Safety Factor	2.0	Slope (1:X)	500.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	99.600	Cap Infiltration Depth (m)	0.000
Base Width (m)	0.4		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0046-7000-0400-7000
Design Head (m)	0.400
Design Flow (l/s)	0.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	46
Invert Level (m)	99.600
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	0.7	Kick-Flo®	0.270	0.6
Flush-Flo™	0.119	0.7	Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.1	3.000	1.7	7.000	2.6
0.200	0.7	1.400	1.2	3.500	1.8	7.500	2.7
0.300	0.6	1.600	1.3	4.000	2.0	8.000	2.8
0.400	0.7	1.800	1.4	4.500	2.1	8.500	2.9
0.500	0.8	2.000	1.4	5.000	2.2	9.000	2.9
0.600	0.8	2.200	1.5	5.500	2.3	9.500	3.0
0.800	0.9	2.400	1.6	6.000	2.4		
1.000	1.0	2.600	1.6	6.500	2.5		

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Event: 120 min Winter

