Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.322	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 3.000

Time (mins) From:	To:	Area (ha)
0	4	3.000

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Model Details

Storage is Online Cover Level (m) 103.000

Tank or Pond Structure

Invert Level (m) 100.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	365.0	0.700	365.0	1.400	365.0	2.100	365.0
0.100	365.0	0.800	365.0	1.500	365.0	2.200	365.0
0.200	365.0	0.900	365.0	1.600	365.0	2.300	365.0
0.300	365.0	1.000	365.0	1.700	365.0	2.400	365.0
0.400	365.0	1.100	365.0	1.800	365.0	2.500	365.0
0.500	365.0	1.200	365.0	1.900	365.0		
0.600	365.0	1.300	365.0	2.000	365.0		

Hydro-Brake® Outflow Control

Design Head (m) 2.400 Hydro-Brake® Type Md6 SW Only Invert Level (m) 100.000
Design Flow (l/s) 27.0 Diameter (mm) 174

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.8	1.200	19.3	3.000	29.9	7.000	45.7
0.200	14.1	1.400	20.6	3.500	32.3	7.500	47.3
0.300	18.5	1.600	21.9	4.000	34.5	8.000	48.9
0.400	19.0	1.800	23.2	4.500	36.6	8.500	50.4
0.500	18.6	2.000	24.4	5.000	38.6	9.000	51.8
0.600	18.0	2.200	25.6	5.500	40.5	9.500	53.2
0.800	17.5	2.400	26.8	6.000	42.3		
1.000	18.1	2.600	27.9	6.500	44.0		

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	100.866	0.866	26.5	612.7	O K
30 min Summer	101.168	1.168	26.5	825.9	O K
60 min Summer	101.492	1.492	26.5	1055.0	O K
120 min Summer	101.801	1.801	26.5	1273.7	O K
180 min Summer	101.945	1.945	26.5	1375.5	O K
240 min Summer	102.014	2.014	26.5	1424.4	O K
360 min Summer	102.073	2.073	26.5	1466.6	O K
480 min Summer	102.073	2.073	26.5	1466.4	O K
600 min Summer	102.058	2.058	26.5	1455.8	O K
720 min Summer	102.037	2.037	26.5	1440.7	O K
960 min Summer	101.984	1.984	26.5	1403.2	O K
1440 min Summer	101.863	1.863	26.5	1318.0	O K
2160 min Summer	101.670	1.670	26.5	1181.0	O K
2880 min Summer	101.457	1.457	26.5	1030.6	O K
4320 min Summer	101.018	1.018	26.5	719.8	O K
5760 min Summer	100.720	0.720	26.5	509.4	O K
7200 min Summer	100.525	0.525	26.2	371.7	O K
8640 min Summer	100.398	0.398	25.2	281.3	O K
10080 min Summer	100.315	0.315	24.0	222.7	O K
15 min Winter	100.973	0.973	26.5	688.1	O K
30 min Winter	101.314	1.314	26.5	929.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	112.400	0.0	623.4	19
30 min Summer	76.645	0.0	852.0	33
60 min Summer	49.937	0.0	1119.1	64
120 min Summer	31.389	0.0	1407.6	122
180 min Summer	23.536	0.0	1583.3	182
240 min Summer	19.027	0.0	1706.8	242
360 min Summer	14.108	0.0	1898.4	360
480 min Summer	11.392	0.0	2044.0	456
600 min Summer	9.642	0.0	2162.4	508
720 min Summer	8.409	0.0	2262.7	570
960 min Summer	6.768	0.0	2427.7	702
1440 min Summer	4.973	0.0	2673.4	980
2160 min Summer	3.645	0.0	2949.7	1404
2880 min Summer	2.920	0.0	3150.0	1816
4320 min Summer	2.131	0.0	3446.2	2508
5760 min Summer	1.703	0.0	3677.8	3224
7200 min Summer	1.433	0.0	3867.8	3888
8640 min Summer	1.245	0.0	4029.9	4576
10080 min Summer	1.105	0.0	4170.9	5240
15 min Winter	112.400	0.0	698.9	18
30 min Winter	76.645	0.0	954.6	33

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	101.681	1.681	26.5	1189.2	O K
120 min Winter	102.034	2.034	26.5	1438.9	O K
180 min Winter	102.205	2.205	26.5	1559.8	O K
240 min Winter	102.293	2.293	26.5	1621.7	O K
360 min Winter	102.380	2.380	26.6	1683.6	O K
480 min Winter	102.399	2.399	26.7	1696.9	O K
600 min Winter	102.382	2.382	26.6	1684.6	O K
720 min Winter	102.346	2.346	26.5	1659.3	O K
960 min Winter	102.280	2.280	26.5	1612.9	O K
1440 min Winter	102.107	2.107	26.5	1490.2	O K
2160 min Winter	101.814	1.814	26.5	1283.4	O K
2880 min Winter	101.490	1.490	26.5	1054.1	O K
4320 min Winter	100.829	0.829	26.5	586.4	O K
5760 min Winter	100.479	0.479	25.9	338.5	O K
7200 min Winter	100.307	0.307	23.8	216.8	O K
8640 min Winter	100.224	0.224	21.8	158.1	O K
10080 min Winter	100.199	0.199	19.5	140.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	49.937	0.0	1253.7	62
120 min Winter	31.389	0.0	1576.7	120
180 min Winter	23.536	0.0	1773.6	178
240 min Winter	19.027	0.0	1911.9	236
360 min Winter	14.108	0.0	2126.4	350
480 min Winter	11.392	0.0	2289.4	458
600 min Winter	9.642	0.0	2421.9	562
720 min Winter	8.409	0.0	2534.2	600
960 min Winter	6.768	0.0	2718.7	742
1440 min Winter	4.973	0.0	2993.1	1054
2160 min Winter	3.645	0.0	3303.9	1516
2880 min Winter	2.920	0.0	3528.3	1964
4320 min Winter	2.131	0.0	3860.7	2636
5760 min Winter	1.703	0.0	4119.4	3232
7200 min Winter	1.433	0.0	4332.2	3888
8640 min Winter	1.245	0.0	4514.0	4416
10080 min Winter	1.105	0.0	4672.6	5144

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

Time Area Diagram

Total Area (ha) 3.000

Time (mins) From:	To:	Area (ha)
0	4	3.000

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Model Details

Storage is Online Cover Level (m) 103.000

Tank or Pond Structure

Invert Level (m) 100.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	707.3	0.700	707.3	1.400	707.3	2.100	707.3
0.100	707.3	0.800	707.3	1.500	707.3	2.200	707.3
0.200	707.3	0.900	707.3	1.600	707.3	2.300	707.3
0.300	707.3	1.000	707.3	1.700	707.3	2.400	707.3
0.400	707.3	1.100	707.3	1.800	707.3	2.500	707.3
0.500	707.3	1.200	707.3	1.900	707.3		
0.600	707.3	1.300	707.3	2.000	707.3		

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0205-2700-2400-2700
Design Head (m)	2.400
Design Flow (l/s)	27.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	205
Invert Level (m)	100.000
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.400	26.7
Flush-Flo™	0.685	26.5
Kick-Flo®	1.448	21.0
Mean Flow over Head Range	-	23.2

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	7.0	1.200	24.5	3.000	29.7	7.000	44.6
0.200	19.5	1.400	21.9	3.500	32.0	7.500	46.2
0.300	23.7	1.600	22.0	4.000	34.1	8.000	47.6
0.400	25.2	1.800	23.2	4.500	36.1	8.500	49.0
0.500	26.0	2.000	24.4	5.000	37.9	9.000	50.4
0.600	26.4	2.200	25.6	5.500	39.7	9.500	51.8
0.800	26.4	2.400	26.7	6.000	41.4		
1.000	25.8	2.600	27.7	6.500	43.1		

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