

2 Hallam Road, Priory Park East
Hull, Humberside
HU4 7DY



Date 15/02/2024 22:02
File Calcs 3.5ls.SRCX

Designed by GGPAeecOne
Checked by

Innovyze Source Control 2020.1.3

Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	31.586	0.286	3.5	28.6	O K
30 min Summer	31.668	0.368	3.5	36.8	O K
60 min Summer	31.736	0.436	3.5	43.6	O K
120 min Summer	31.770	0.470	3.5	47.0	O K
180 min Summer	31.763	0.463	3.5	46.3	O K
240 min Summer	31.748	0.448	3.5	44.8	O K
360 min Summer	31.717	0.417	3.5	41.7	O K
480 min Summer	31.685	0.385	3.5	38.5	O K
600 min Summer	31.654	0.354	3.5	35.4	O K
720 min Summer	31.623	0.323	3.5	32.3	O K
960 min Summer	31.566	0.266	3.5	26.6	O K
1440 min Summer	31.475	0.175	3.5	17.5	O K
2160 min Summer	31.394	0.094	3.4	9.4	O K
2880 min Summer	31.358	0.058	3.1	5.8	O K
4320 min Summer	31.333	0.033	2.4	3.3	O K
5760 min Summer	31.321	0.021	2.0	2.1	O K
7200 min Summer	31.313	0.013	1.7	1.3	O K
8640 min Summer	31.308	0.008	1.5	0.8	O K
10080 min Summer	31.304	0.004	1.3	0.4	O K
15 min Winter	31.625	0.325	3.5	32.5	O K
30 min Winter	31.720	0.420	3.5	42.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	102.243	0.0	32.1	21
30 min Summer	67.875	0.0	42.7	35
60 min Summer	43.136	0.0	54.3	64
120 min Summer	26.588	0.0	67.0	120
180 min Summer	19.796	0.0	74.7	154
240 min Summer	15.981	0.0	80.4	182
360 min Summer	11.821	0.0	89.2	248
480 min Summer	9.531	0.0	96.0	314
600 min Summer	8.060	0.0	101.5	380
720 min Summer	7.026	0.0	106.1	446
960 min Summer	5.653	0.0	113.9	572
1440 min Summer	4.155	0.0	125.6	810
2160 min Summer	3.050	0.0	138.3	1148
2880 min Summer	2.447	0.0	147.9	1476
4320 min Summer	1.792	0.0	162.5	2204
5760 min Summer	1.436	0.0	173.6	2936
7200 min Summer	1.209	0.0	182.7	3672
8640 min Summer	1.051	0.0	190.6	4400
10080 min Summer	0.933	0.0	197.5	5120
15 min Winter	102.243	0.0	36.0	21
30 min Winter	67.875	0.0	47.9	35

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Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Winter	31.804	0.504	3.5	50.4	O K
120 min Winter	31.849	0.549	3.5	54.9	O K
180 min Winter	31.845	0.545	3.5	54.5	O K
240 min Winter	31.826	0.526	3.5	52.6	O K
360 min Winter	31.785	0.485	3.5	48.5	O K
480 min Winter	31.732	0.432	3.5	43.2	O K
600 min Winter	31.679	0.379	3.5	37.9	O K
720 min Winter	31.629	0.329	3.5	32.9	O K
960 min Winter	31.540	0.240	3.5	24.0	O K
1440 min Winter	31.418	0.118	3.4	11.8	O K
2160 min Winter	31.352	0.052	2.9	5.2	O K
2880 min Winter	31.333	0.033	2.4	3.3	O K
4320 min Winter	31.316	0.016	1.8	1.6	O K
5760 min Winter	31.308	0.008	1.4	0.8	O K
7200 min Winter	31.302	0.002	1.2	0.2	O K
8640 min Winter	31.300	0.000	1.0	0.0	O K
10080 min Winter	31.300	0.000	0.9	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Winter	43.136	0.0	60.8	62
120 min Winter	26.588	0.0	74.9	118
180 min Winter	19.796	0.0	83.7	172
240 min Winter	15.981	0.0	90.1	196
360 min Winter	11.821	0.0	100.0	274
480 min Winter	9.531	0.0	107.6	346
600 min Winter	8.060	0.0	113.7	414
720 min Winter	7.026	0.0	118.9	480
960 min Winter	5.653	0.0	127.6	606
1440 min Winter	4.155	0.0	140.7	826
2160 min Winter	3.050	0.0	154.9	1128
2880 min Winter	2.447	0.0	165.7	1476
4320 min Winter	1.792	0.0	182.0	2204
5760 min Winter	1.436	0.0	194.4	2928
7200 min Winter	1.209	0.0	204.7	3672
8640 min Winter	1.051	0.0	213.5	0
10080 min Winter	0.933	0.0	221.3	0

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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)	20.000	Shortest Storm (mins)	15
Ratio R	0.355	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.168

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 4	0.084	4 8	0.084

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Model Details

Storage is Online Cover Level (m) 33.700

Tank or Pond Structure

Invert Level (m) 31.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	100.0	1.200	100.0	1.201	1.0	2.400	1.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0092-3500-0800-3500
 Design Head (m) 0.800
 Design Flow (l/s) 3.5
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 92
 Invert Level (m) 31.250
 Minimum Outlet Pipe Diameter (mm) 150
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	3.5
Flush-Flo™	0.238	3.5
Kick-Flo®	0.521	2.9
Mean Flow over Head Range	-	3.0

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	2.9	1.200	4.2	3.000	6.5	7.000	9.7
0.200	3.5	1.400	4.5	3.500	7.0	7.500	10.0
0.300	3.5	1.600	4.8	4.000	7.4	8.000	10.3
0.400	3.3	1.800	5.1	4.500	7.8	8.500	10.6
0.500	3.0	2.000	5.3	5.000	8.2	9.000	10.9
0.600	3.1	2.200	5.6	5.500	8.6	9.500	11.2
0.800	3.5	2.400	5.8	6.000	9.0		
1.000	3.9	2.600	6.0	6.500	9.3		