

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



Date 15/02/2024 22:01  
 File Calcs 3.5ls.SRCX

Designed by GGPAeecOne  
 Checked by

Innovyze Source Control 2020.1.3

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	31.681	0.381	3.5	38.1	O K
30 min Summer	31.800	0.500	3.5	50.0	O K
60 min Summer	31.904	0.604	3.5	60.4	O K
120 min Summer	31.964	0.664	3.5	66.4	O K
180 min Summer	31.963	0.663	3.5	66.3	O K
240 min Summer	31.948	0.648	3.5	64.8	O K
360 min Summer	31.919	0.619	3.5	61.9	O K
480 min Summer	31.888	0.588	3.5	58.8	O K
600 min Summer	31.857	0.557	3.5	55.7	O K
720 min Summer	31.824	0.524	3.5	52.4	O K
960 min Summer	31.752	0.452	3.5	45.2	O K
1440 min Summer	31.620	0.320	3.5	32.0	O K
2160 min Summer	31.483	0.183	3.5	18.3	O K
2880 min Summer	31.406	0.106	3.4	10.6	O K
4320 min Summer	31.351	0.051	2.9	5.1	O K
5760 min Summer	31.332	0.032	2.4	3.2	O K
7200 min Summer	31.322	0.022	2.0	2.2	O K
8640 min Summer	31.315	0.015	1.7	1.5	O K
10080 min Summer	31.310	0.010	1.5	1.0	O K
15 min Winter	31.731	0.431	3.5	43.1	O K
30 min Winter	31.867	0.567	3.5	56.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	132.507	0.0	41.6	21
30 min Summer	88.791	0.0	55.9	36
60 min Summer	56.713	0.0	71.4	64
120 min Summer	34.923	0.0	87.9	122
180 min Summer	25.885	0.0	97.8	168
240 min Summer	20.787	0.0	104.7	196
360 min Summer	15.281	0.0	115.4	262
480 min Summer	12.263	0.0	123.6	332
600 min Summer	10.330	0.0	130.1	402
720 min Summer	8.975	0.0	135.6	472
960 min Summer	7.181	0.0	144.7	606
1440 min Summer	5.235	0.0	158.3	850
2160 min Summer	3.809	0.0	172.7	1192
2880 min Summer	3.035	0.0	183.5	1528
4320 min Summer	2.200	0.0	199.5	2208
5760 min Summer	1.749	0.0	211.5	2936
7200 min Summer	1.464	0.0	221.3	3672
8640 min Summer	1.267	0.0	229.8	4400
10080 min Summer	1.121	0.0	237.2	5136
15 min Winter	132.507	0.0	46.7	21
30 min Winter	88.791	0.0	62.6	35

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	31.988	0.688	3.5	68.8	O K
120 min Winter	32.068	0.768	3.5	76.8	O K
180 min Winter	32.074	0.774	3.5	77.4	O K
240 min Winter	32.055	0.755	3.5	75.5	O K
360 min Winter	32.016	0.716	3.5	71.6	O K
480 min Winter	31.972	0.672	3.5	67.2	O K
600 min Winter	31.925	0.625	3.5	62.5	O K
720 min Winter	31.877	0.577	3.5	57.7	O K
960 min Winter	31.771	0.471	3.5	47.1	O K
1440 min Winter	31.565	0.265	3.5	26.5	O K
2160 min Winter	31.401	0.101	3.4	10.1	O K
2880 min Winter	31.352	0.052	3.0	5.2	O K
4320 min Winter	31.327	0.027	2.2	2.7	O K
5760 min Winter	31.315	0.015	1.7	1.5	O K
7200 min Winter	31.308	0.008	1.5	0.8	O K
8640 min Winter	31.303	0.003	1.3	0.3	O K
10080 min Winter	31.300	0.000	1.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	56.713	0.0	80.0	64
120 min Winter	34.923	0.0	98.5	120
180 min Winter	25.885	0.0	109.6	174
240 min Winter	20.787	0.0	117.2	222
360 min Winter	15.281	0.0	129.3	278
480 min Winter	12.263	0.0	138.4	358
600 min Winter	10.330	0.0	145.8	434
720 min Winter	8.975	0.0	152.0	510
960 min Winter	7.181	0.0	162.1	662
1440 min Winter	5.235	0.0	177.3	888
2160 min Winter	3.809	0.0	193.4	1196
2880 min Winter	3.035	0.0	205.5	1500
4320 min Winter	2.200	0.0	223.5	2204
5760 min Winter	1.749	0.0	236.9	2936
7200 min Winter	1.464	0.0	247.8	3672
8640 min Winter	1.267	0.0	257.4	4408
10080 min Winter	1.121	0.0	265.7	0

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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	0.355	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 <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
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		