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Elm House Farm	SLEAFORD RENEWABLE	
Saughton	ENERGY PLANT	
Chester CH3 6EN	SW REGULATORY SYSTEM	
Date MAY 2007	Designed By MCH	
File Attenuation.src	Checked By	
CADS	Source Control W.10.2	

Summary of Results for 100 year Return Period (+20%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	11.5	11.5	10.6848	0.1847	415.3	O K
30 Summer	13.5	13.5	10.7518	0.2517	566.9	O K
60 Summer	14.2	14.2	10.8268	0.3267	734.6	O K
120 Summer	14.2	14.2	10.9028	0.4027	906.7	O K
180 Summer	14.2	14.2	10.9422	0.4422	995.4	O K
240 Summer	14.3	14.3	10.9677	0.4677	1052.2	O K
360 Summer	14.6	14.6	10.9982	0.4982	1121.2	O K
480 Summer	14.8	14.8	11.0138	0.5137	1155.4	O K
600 Summer	14.9	14.9	11.0203	0.5202	1170.9	O K
720 Summer	15.0	15.0	11.0248	0.5247	1181.2	O K
960 Summer	15.0	15.0	11.0293	0.5292	1191.0	O K
1440 Summer	15.0	15.0	11.0268	0.5267	1185.0	O K
2160 Summer	14.8	14.8	11.0083	0.5082	1143.0	O K
2880 Summer	14.5	14.5	10.9827	0.4827	1085.6	O K
4320 Summer	14.2	14.2	10.9282	0.4282	963.7	O K
5760 Summer	14.2	14.2	10.8743	0.3742	841.7	O K
7200 Summer	14.2	14.2	10.8258	0.3257	733.2	O K
8640 Summer	14.0	14.0	10.7893	0.2892	650.3	O K
10080 Summer	13.6	13.6	10.7608	0.2607	586.7	O K
15 Winter	12.8	12.8	10.7068	0.2067	465.1	O K
30 Winter	13.9	13.9	10.7828	0.2827	636.3	O K
60 Winter	14.2	14.2	10.8673	0.3672	826.1	O K


Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	89.23	19
30 Summer	61.54	33
60 Summer	40.51	64
120 Summer	25.63	122
180 Summer	19.23	182
240 Summer	15.63	242
360 Summer	11.65	362
480 Summer	9.44	480
600 Summer	8.01	560
720 Summer	7.00	612
960 Summer	5.65	740
1440 Summer	4.17	998
2160 Summer	3.07	1408
2880 Summer	2.46	1820
4320 Summer	1.81	2636
5760 Summer	1.45	3400
7200 Summer	1.23	4112
8640 Summer	1.07	4832
10080 Summer	0.95	5544
15 Winter	89.23	19
30 Winter	61.54	33
60 Winter	40.51	62

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120 Winter	14.2	14.2	10.9537	0.4537	1020.7	O K
180 Winter	14.6	14.6	10.9982	0.4982	1121.6	O K
240 Winter	15.0	15.0	11.0278	0.5277	1187.2	O K
360 Winter	15.5	15.5	11.0643	0.5643	1269.2	O K
480 Winter	15.8	15.8	11.0838	0.5838	1312.9	O K
600 Winter	15.9	15.9	11.0933	0.5933	1335.1	O K
720 Winter	16.0	16.0	11.0973	0.5973	1343.8	O K
960 Winter	16.0	16.0	11.0978	0.5978	1344.7	O K
1440 Winter	15.8	15.8	11.0893	0.5893	1326.0	O K
2160 Winter	15.4	15.4	11.0573	0.5572	1253.6	O K
2880 Winter	14.9	14.9	11.0168	0.5167	1162.8	O K
4320 Winter	14.2	14.2	10.9332	0.4332	974.7	O K
5760 Winter	14.2	14.2	10.8493	0.3492	785.7	O K
7200 Winter	14.0	14.0	10.7858	0.2857	642.7	O K
8640 Winter	13.3	13.3	10.7418	0.2417	543.4	O K
10080 Winter	12.8	12.8	10.7093	0.2092	470.3	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
120 Winter	25.63	120
180 Winter	19.23	180
240 Winter	15.63	238
360 Winter	11.65	352
480 Winter	9.44	464
600 Winter	8.01	572
720 Winter	7.00	678
960 Winter	5.65	770
1440 Winter	4.17	1080
2160 Winter	3.07	1536
2880 Winter	2.46	1984
4320 Winter	1.81	2812
5760 Winter	1.45	3576
7200 Winter	1.23	4248
8640 Winter	1.07	4928
10080 Winter	0.95	5544

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Rainfall Details

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	Longest Storm (mins)	10080
M5-60 (mm)	20.000	Summer Storms	Yes
Ratio-R	0.300	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+20
Cv (Winter)	0.840		

Time / Area Diagram

Total Area (ha) = 2.100

Time (mins)	Area (ha)
from:	to:
0	4 2.100

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Tank/Pond Details

Invert Level (m)		10.500		Ground Level (m)		12.000			
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.00	2250.0	0.60	2250.0	1.20	2250.0	1.80	2250.0	2.40	2250.0
0.10	2250.0	0.70	2250.0	1.30	2250.0	1.90	2250.0	2.50	2250.0
0.20	2250.0	0.80	2250.0	1.40	2250.0	2.00	2250.0		
0.30	2250.0	0.90	2250.0	1.50	2250.0	2.10	2250.0		
0.40	2250.0	1.00	2250.0	1.60	2250.0	2.20	2250.0		
0.50	2250.0	1.10	2250.0	1.70	2250.0	2.30	2250.0		

Hydro-Brake Outflow Control

Design Head (m)	0.600	Hydro-Brake Type	MD3	Invert Level (m)	10.500
Design Flow (l/s)	16.0	Diameter (mm)	146		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	5.2	0.80	18.5	2.00	29.2	4.00	41.3	7.00	54.6
0.20	12.7	1.00	20.6	2.20	30.6	4.50	43.8	7.50	56.5
0.30	14.2	1.20	22.6	2.40	32.0	5.00	46.1	8.00	58.4
0.40	13.5	1.40	24.4	2.60	33.3	5.50	48.4	8.50	60.2
0.50	14.6	1.60	26.1	3.00	35.7	6.00	50.5	9.00	61.9
0.60	16.0	1.80	27.7	3.50	38.6	6.50	52.6	9.50	63.6