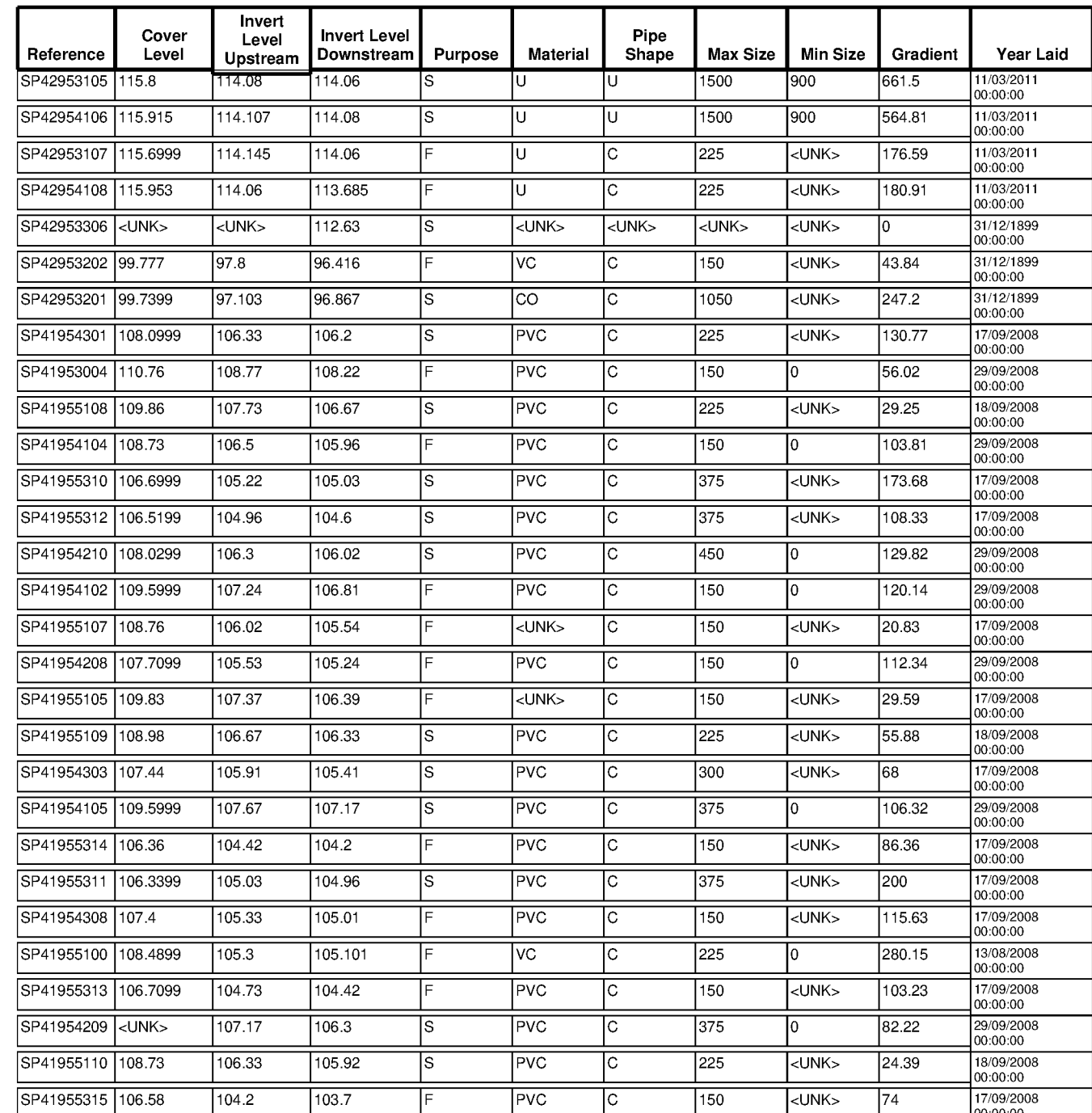


Appendix 3: STW Asset Records



CATEGORIES

- Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

SEWER RECORD (Tabular)

O/S Map Scale: 1:5,000 **This map is centred upon:**
Date of Issue: 20-01-22 **X:** 441901.96 **Y:** 295562.02

Disclaimer Statement:

- 1 Do not scale off this Map.
- 2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.
- 3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.
- 4 Reproduction by permission of Ordnance Survey on behalf of HMSO. Crown Copyright and database right 2004. All rights reserved.
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- 6 Document users other than SEVERN TRENT WATER business users are advised that this document is provided for reference purpose only and is subject to copyright, therefore, no further copies should be made from it.

Appendix 4: MicroDrainage Greenfield Runoff Rates

BWB Consulting Ltd		Page 1																								
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ																										
Date 26/01/2022 12:10 File	Designed by Sam.Cooper Checked by																									
Innovyze	Source Control 2020.1																									
<u>ICP SUDS Mean Annual Flood</u> Input <table><tr><td>Return Period (years)</td><td>1</td><td>Soil</td><td>0.450</td></tr><tr><td>Area (ha)</td><td>1.000</td><td>Urban</td><td>0.000</td></tr><tr><td>SAAR (mm)</td><td>700</td><td>Region Number</td><td>Region 4</td></tr></table> Results 1/s <table><tr><td>QBAR Rural</td><td>4.4</td></tr><tr><td>QBAR Urban</td><td>4.4</td></tr><tr><td>Q1 year</td><td>3.6</td></tr><tr><td>Q1 year</td><td>3.6</td></tr><tr><td>Q30 years</td><td>8.6</td></tr><tr><td>Q100 years</td><td>11.3</td></tr></table>			Return Period (years)	1	Soil	0.450	Area (ha)	1.000	Urban	0.000	SAAR (mm)	700	Region Number	Region 4	QBAR Rural	4.4	QBAR Urban	4.4	Q1 year	3.6	Q1 year	3.6	Q30 years	8.6	Q100 years	11.3
Return Period (years)	1	Soil	0.450																							
Area (ha)	1.000	Urban	0.000																							
SAAR (mm)	700	Region Number	Region 4																							
QBAR Rural	4.4																									
QBAR Urban	4.4																									
Q1 year	3.6																									
Q1 year	3.6																									
Q30 years	8.6																									
Q100 years	11.3																									
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Appendix 5: MicroDrainage Greenfield Runoff Volume

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		
Date 17/03/2022 17:32	Designed by Sam.Cooper	
File Storage Estimate Catchm...	Checked by	
Innovyze	Source Control 2020.1	

Greenfield Runoff Volume

FEH Data

Return Period (years)	100
Storm Duration (mins)	360
FEH Rainfall Version	2013
Site Location	GB 441450 298000 SP 41450 98000
Data Type	Catchment
Areal Reduction Factor	1.00
Area (ha)	25.390
SAAR (mm)	700
CWI	105.000
SPR Host	42.870
URBEXT (1990)	0.0997

Results

Percentage Runoff (%)	43.97
Greenfield Runoff Volume (m ³)	7368.660

Appendix 6: MicroDrainage Storage Requirements

BWB Consulting Ltd				Page 1	
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North East A Basin FEh			
Date 17/03/2022		Designed by SC			
File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	99.279	0.279	5.5	219.8	O K
30 min Summer	99.356	0.356	5.5	286.3	O K
60 min Summer	99.431	0.431	5.5	353.0	O K
120 min Summer	99.507	0.507	5.5	423.4	O K
180 min Summer	99.551	0.551	5.5	465.1	O K
240 min Summer	99.579	0.579	5.5	491.6	O K
360 min Summer	99.606	0.606	5.5	518.0	O K
480 min Summer	99.611	0.611	5.5	523.6	O K
600 min Summer	99.606	0.606	5.5	518.6	O K
720 min Summer	99.595	0.595	5.5	507.2	O K
960 min Summer	99.560	0.560	5.5	473.4	O K
1440 min Summer	99.500	0.500	5.5	416.7	O K
2160 min Summer	99.434	0.434	5.5	356.0	O K
2880 min Summer	99.381	0.381	5.5	308.4	O K
4320 min Summer	99.297	0.297	5.5	234.7	O K
5760 min Summer	99.231	0.231	5.5	179.6	O K
7200 min Summer	99.182	0.182	5.5	139.8	O K
8640 min Summer	99.145	0.145	5.4	110.6	O K
10080 min Summer	99.118	0.118	5.3	88.9	O K
15 min Winter	99.311	0.311	5.5	247.2	O K
30 min Winter	99.397	0.397	5.5	322.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.960	0.0	227.3	26	
30 min Summer	88.480	0.0	298.3	41	
60 min Summer	55.440	0.0	373.5	70	
120 min Summer	34.230	0.0	461.5	130	
180 min Summer	25.723	0.0	520.4	188	
240 min Summer	20.895	0.0	563.6	248	
360 min Summer	15.400	0.0	623.4	366	
480 min Summer	12.270	0.0	662.3	484	
600 min Summer	10.233	0.0	690.3	604	
720 min Summer	8.797	0.0	712.4	722	
960 min Summer	6.893	0.0	744.1	880	
1440 min Summer	4.853	0.0	786.0	1070	
2160 min Summer	3.408	0.0	827.7	1452	
2880 min Summer	2.660	0.0	861.8	1848	
4320 min Summer	1.900	0.0	923.2	2604	
5760 min Summer	1.514	0.0	980.9	3352	
7200 min Summer	1.285	0.0	1040.1	4104	
8640 min Summer	1.133	0.0	1101.3	4760	
10080 min Summer	1.026	0.0	1162.9	5456	
15 min Winter	134.960	0.0	254.6	26	
30 min Winter	88.480	0.0	334.1	40	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North East A Basin FEh			
Date 17/03/2022		Designed by SC			
File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	99.481	0.481	5.5	398.5	O K
120 min Winter	99.567	0.567	5.5	480.3	O K
180 min Winter	99.618	0.618	5.5	530.0	O K
240 min Winter	99.650	0.650	5.5	561.9	O K
360 min Winter	99.683	0.683	5.5	595.1	O K
480 min Winter	99.693	0.693	5.5	605.2	O K
600 min Winter	99.691	0.691	5.5	603.9	O K
720 min Winter	99.684	0.684	5.5	596.0	O K
960 min Winter	99.657	0.657	5.5	569.4	O K
1440 min Winter	99.586	0.586	5.5	499.1	O K
2160 min Winter	99.494	0.494	5.5	411.1	O K
2880 min Winter	99.417	0.417	5.5	340.3	O K
4320 min Winter	99.290	0.290	5.5	228.9	O K
5760 min Winter	99.193	0.193	5.5	148.9	O K
7200 min Winter	99.126	0.126	5.4	95.7	O K
8640 min Winter	99.081	0.081	5.2	60.6	O K
10080 min Winter	99.051	0.051	5.0	37.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	55.440	0.0	418.6	70	
120 min Winter	34.230	0.0	517.4	128	
180 min Winter	25.723	0.0	582.8	186	
240 min Winter	20.895	0.0	631.5	244	
360 min Winter	15.400	0.0	698.1	360	
480 min Winter	12.270	0.0	741.7	476	
600 min Winter	10.233	0.0	773.2	590	
720 min Winter	8.797	0.0	797.9	702	
960 min Winter	6.893	0.0	833.5	924	
1440 min Winter	4.853	0.0	846.6	1294	
2160 min Winter	3.408	0.0	927.1	1588	
2880 min Winter	2.660	0.0	965.1	2016	
4320 min Winter	1.900	0.0	1033.7	2812	
5760 min Winter	1.514	0.0	1098.0	3520	
7200 min Winter	1.285	0.0	1165.4	4192	
8640 min Winter	1.133	0.0	1232.9	4848	
10080 min Winter	1.026	0.0	1302.9	5544	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North East A Basin FEh	
Date 17/03/2022	Designed by SC	
File Storage Estimate Catchm...	Checked by	
Innovyze	Source Control 2020.1	

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 441450 298000 SP 41450 98000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.900

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.300		4 8 0.300		8 12 0.300	

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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North East A Basin FEh	
Date 17/03/2022	Designed by SC	
File Storage Estimate Catchm...	Checked by	
Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 99.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	732.9	1.000	1167.1

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0109-5500-1100-5500
Design Head (m)	1.100
Design Flow (l/s)	5.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	109
Invert Level (m)	98.900
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	5.5
Flush-Flo™	0.324	5.5
Kick-Flo®	0.695	4.4
Mean Flow over Head Range	-	4.8

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	3.7	1.200	5.7	3.000	8.8	7.000	13.2
0.200	5.3	1.400	6.2	3.500	9.5	7.500	13.6
0.300	5.5	1.600	6.5	4.000	10.1	8.000	14.0
0.400	5.4	1.800	6.9	4.500	10.7	8.500	14.4
0.500	5.3	2.000	7.3	5.000	11.2	9.000	14.8
0.600	5.0	2.200	7.6	5.500	11.7	9.500	15.2
0.800	4.7	2.400	7.9	6.000	12.2		
1.000	5.3	2.600	8.2	6.500	12.7		

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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North East A Basin FSR			
Date 17/03/2022		Designed by SC			
File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	99.285	0.285	5.5	225.2	O K
30 min Summer	99.365	0.365	5.5	293.8	O K
60 min Summer	99.441	0.441	5.5	361.6	O K
120 min Summer	99.508	0.508	5.5	423.6	O K
180 min Summer	99.539	0.539	5.5	453.4	O K
240 min Summer	99.555	0.555	5.5	469.0	O K
360 min Summer	99.570	0.570	5.5	483.6	O K
480 min Summer	99.574	0.574	5.5	486.8	O K
600 min Summer	99.570	0.570	5.5	482.9	O K
720 min Summer	99.561	0.561	5.5	474.4	O K
960 min Summer	99.537	0.537	5.5	452.0	O K
1440 min Summer	99.498	0.498	5.5	414.8	O K
2160 min Summer	99.451	0.451	5.5	370.7	O K
2880 min Summer	99.407	0.407	5.5	331.0	O K
4320 min Summer	99.325	0.325	5.5	259.4	O K
5760 min Summer	99.253	0.253	5.5	198.1	O K
7200 min Summer	99.192	0.192	5.5	148.2	O K
8640 min Summer	99.144	0.144	5.4	109.2	O K
10080 min Summer	99.105	0.105	5.3	79.3	O K
15 min Winter	99.318	0.318	5.5	253.2	O K
30 min Winter	99.407	0.407	5.5	330.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	138.153	0.0	232.6	26	
30 min Summer	90.705	0.0	305.7	41	
60 min Summer	56.713	0.0	382.2	70	
120 min Summer	34.246	0.0	462.0	130	
180 min Summer	25.149	0.0	509.0	188	
240 min Summer	20.078	0.0	541.8	248	
360 min Summer	14.585	0.0	590.2	366	
480 min Summer	11.622	0.0	627.4	484	
600 min Summer	9.738	0.0	656.9	602	
720 min Summer	8.424	0.0	682.1	720	
960 min Summer	6.697	0.0	722.9	840	
1440 min Summer	4.839	0.0	783.6	1068	
2160 min Summer	3.490	0.0	848.1	1456	
2880 min Summer	2.766	0.0	895.9	1852	
4320 min Summer	1.989	0.0	966.3	2640	
5760 min Summer	1.573	0.0	1019.7	3400	
7200 min Summer	1.311	0.0	1061.0	4104	
8640 min Summer	1.129	0.0	1096.1	4760	
10080 min Summer	0.994	0.0	1126.9	5448	
15 min Winter	138.153	0.0	260.7	26	
30 min Winter	90.705	0.0	342.4	40	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North East A Basin FSR			
Date 17/03/2022		Designed by SC			
File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	99.491	0.491	5.5	408.1	O K
120 min Winter	99.567	0.567	5.5	480.5	O K
180 min Winter	99.604	0.604	5.5	516.9	O K
240 min Winter	99.625	0.625	5.5	537.2	O K
360 min Winter	99.646	0.646	5.5	558.4	O K
480 min Winter	99.655	0.655	5.5	566.8	O K
600 min Winter	99.655	0.655	5.5	567.4	O K
720 min Winter	99.651	0.651	5.5	563.3	O K
960 min Winter	99.635	0.635	5.5	546.6	O K
1440 min Winter	99.583	0.583	5.5	496.3	O K
2160 min Winter	99.514	0.514	5.5	429.9	O K
2880 min Winter	99.449	0.449	5.5	369.0	O K
4320 min Winter	99.325	0.325	5.5	258.7	O K
5760 min Winter	99.218	0.218	5.5	169.4	O K
7200 min Winter	99.137	0.137	5.4	103.9	O K
8640 min Winter	99.079	0.079	5.2	59.4	O K
10080 min Winter	99.042	0.042	4.9	30.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	56.713	0.0	428.3	70	
120 min Winter	34.246	0.0	517.5	128	
180 min Winter	25.149	0.0	570.0	186	
240 min Winter	20.078	0.0	606.8	244	
360 min Winter	14.585	0.0	661.0	360	
480 min Winter	11.622	0.0	702.5	474	
600 min Winter	9.738	0.0	735.9	590	
720 min Winter	8.424	0.0	764.0	702	
960 min Winter	6.697	0.0	809.5	922	
1440 min Winter	4.839	0.0	847.3	1206	
2160 min Winter	3.490	0.0	949.7	1604	
2880 min Winter	2.766	0.0	1003.1	2024	
4320 min Winter	1.989	0.0	1082.1	2820	
5760 min Winter	1.573	0.0	1141.8	3568	
7200 min Winter	1.311	0.0	1188.2	4248	
8640 min Winter	1.129	0.0	1228.2	4848	
10080 min Winter	0.994	0.0	1262.4	5448	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North East A Basin FSR	
Date 17/03/2022	Designed by SC	
File Storage Estimate Catchm...	Checked by	
Innovyze	Source Control 2020.1	

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 %	+40

Time Area Diagram

Total Area (ha) 0.900

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	(ha)	From:	To:	(ha)
0	4	0.300	4	8	0.300
				8	12 0.300

BWB Consulting Ltd		Page 4
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North East A Basin FSR	
Date 17/03/2022	Designed by SC	
File Storage Estimate Catchm...	Checked by	
Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 99.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	732.9	1.000	1167.1

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0109-5500-1100-5500
Design Head (m)	1.100
Design Flow (l/s)	5.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	109
Invert Level (m)	98.900
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	5.5
Flush-Flo™	0.324	5.5
Kick-Flo®	0.695	4.4
Mean Flow over Head Range	-	4.8

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	3.7	1.200	5.7	3.000	8.8	7.000	13.2
0.200	5.3	1.400	6.2	3.500	9.5	7.500	13.6
0.300	5.5	1.600	6.5	4.000	10.1	8.000	14.0
0.400	5.4	1.800	6.9	4.500	10.7	8.500	14.4
0.500	5.3	2.000	7.3	5.000	11.2	9.000	14.8
0.600	5.0	2.200	7.6	5.500	11.7	9.500	15.2
0.800	4.7	2.400	7.9	6.000	12.2		
1.000	5.3	2.600	8.2	6.500	12.7		

BWB Consulting Ltd					Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North East B Basin FEH			
Date 17/03/2022 17:22		Designed by 17.03.22			
File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	99.150	0.350	20.5	834.8	O K
30 min Summer	99.249	0.449	20.5	1088.0	O K
60 min Summer	99.347	0.547	20.5	1343.6	O K
120 min Summer	99.448	0.648	20.5	1614.1	O K
180 min Summer	99.507	0.707	20.5	1776.1	O K
240 min Summer	99.544	0.744	20.5	1880.4	O K
360 min Summer	99.583	0.783	20.5	1989.0	O K
480 min Summer	99.594	0.794	20.5	2020.3	O K
600 min Summer	99.591	0.791	20.5	2011.5	O K
720 min Summer	99.579	0.779	20.5	1978.6	O K
960 min Summer	99.542	0.742	20.5	1873.5	O K
1440 min Summer	99.473	0.673	20.5	1683.1	O K
2160 min Summer	99.389	0.589	20.5	1455.7	O K
2880 min Summer	99.321	0.521	20.5	1274.4	O K
4320 min Summer	99.215	0.415	20.5	998.9	O K
5760 min Summer	99.134	0.334	20.5	794.8	O K
7200 min Summer	99.074	0.274	20.5	647.0	O K
8640 min Summer	99.029	0.229	20.3	537.7	O K
10080 min Summer	98.995	0.195	20.2	456.0	O K
15 min Winter	99.191	0.391	20.5	938.0	O K
30 min Winter	99.301	0.501	20.5	1223.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.960	0.0	859.3	26	
30 min Summer	88.480	0.0	1126.8	41	
60 min Summer	55.440	0.0	1412.4	70	
120 min Summer	34.230	0.0	1744.5	130	
180 min Summer	25.723	0.0	1966.5	188	
240 min Summer	20.895	0.0	2130.4	248	
360 min Summer	15.400	0.0	2355.1	366	
480 min Summer	12.270	0.0	2502.1	484	
600 min Summer	10.233	0.0	2608.2	604	
720 min Summer	8.797	0.0	2690.9	722	
960 min Summer	6.893	0.0	2811.7	876	
1440 min Summer	4.853	0.0	2968.9	1072	
2160 min Summer	3.408	0.0	3126.9	1452	
2880 min Summer	2.660	0.0	3254.2	1848	
4320 min Summer	1.900	0.0	3486.7	2636	
5760 min Summer	1.514	0.0	3704.8	3352	
7200 min Summer	1.285	0.0	3931.8	4104	
8640 min Summer	1.133	0.0	4159.7	4768	
10080 min Summer	1.026	0.0	4394.4	5456	
15 min Winter	134.960	0.0	962.5	26	
30 min Winter	88.480	0.0	1262.2	40	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North East B Basin FEH			
Date 17/03/2022 17:22		Designed by 17.03.22			
File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	99.410	0.610	20.5	1513.2	O K
120 min Winter	99.525	0.725	20.5	1826.5	O K
180 min Winter	99.593	0.793	20.5	2018.0	O K
240 min Winter	99.637	0.837	20.5	2142.7	O K
360 min Winter	99.683	0.883	20.5	2275.9	O K
480 min Winter	99.699	0.899	20.5	2322.3	O K
600 min Winter	99.700	0.900	20.5	2325.3	O K
720 min Winter	99.692	0.892	20.5	2303.6	O K
960 min Winter	99.663	0.863	20.5	2218.9	O K
1440 min Winter	99.581	0.781	20.5	1984.5	O K
2160 min Winter	99.467	0.667	20.5	1668.3	O K
2880 min Winter	99.369	0.569	20.5	1402.8	O K
4320 min Winter	99.210	0.410	20.5	986.9	O K
5760 min Winter	99.090	0.290	20.5	685.8	O K
7200 min Winter	99.006	0.206	20.2	482.3	O K
8640 min Winter	98.950	0.150	19.7	347.9	O K
10080 min Winter	98.915	0.115	19.2	264.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	55.440	0.0	1582.1	70	
120 min Winter	34.230	0.0	1953.8	128	
180 min Winter	25.723	0.0	2202.5	186	
240 min Winter	20.895	0.0	2386.1	244	
360 min Winter	15.400	0.0	2637.8	360	
480 min Winter	12.270	0.0	2802.2	476	
600 min Winter	10.233	0.0	2921.5	590	
720 min Winter	8.797	0.0	3013.4	702	
960 min Winter	6.893	0.0	3100.7	922	
1440 min Winter	4.853	0.0	3087.1	1220	
2160 min Winter	3.408	0.0	3502.6	1588	
2880 min Winter	2.660	0.0	3644.9	2020	
4320 min Winter	1.900	0.0	3905.4	2812	
5760 min Winter	1.514	0.0	4149.3	3528	
7200 min Winter	1.285	0.0	4402.1	4192	
8640 min Winter	1.133	0.0	4658.9	4848	
10080 min Winter	1.026	0.0	4922.4	5448	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North East B Basin FEH	
Date 17/03/2022 17:22	Designed by 17.03.22	
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Innovyze	Source Control 2020.1	

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 441450 298000 SP 41450 98000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 3.400

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4	1.133	4 8	1.133	8 12	1.134

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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North East B Basin FEH	
Date 17/03/2022 17:22	Designed by 17.03.22	
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Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	2267.0	1.200	3149.6

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0197-2050-1300-2050
Design Head (m)	1.300
Design Flow (l/s)	20.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	197
Invert Level (m)	98.700
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	20.5
Flush-Flo™	0.402	20.5
Kick-Flo®	0.883	17.1
Mean Flow over Head Range	-	17.6

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	6.8	1.200	19.7	3.000	30.6	7.000	46.0
0.200	18.4	1.400	21.2	3.500	32.9	7.500	47.6
0.300	20.2	1.600	22.6	4.000	35.1	8.000	49.1
0.400	20.5	1.800	23.9	4.500	37.2	8.500	50.6
0.500	20.3	2.000	25.2	5.000	39.1	9.000	52.0
0.600	20.0	2.200	26.3	5.500	40.9	9.500	53.4
0.800	18.6	2.400	27.5	6.000	42.7		
1.000	18.1	2.600	28.5	6.500	44.4		

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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North East B Basin FSR			
Date 17/03/2022 17:23		Designed by 17.03.22			
File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	99.158	0.358	20.5	855.1	O K
30 min Summer	99.260	0.460	20.5	1116.3	O K
60 min Summer	99.359	0.559	20.5	1376.0	O K
120 min Summer	99.448	0.648	20.5	1614.9	O K
180 min Summer	99.491	0.691	20.5	1732.1	O K
240 min Summer	99.514	0.714	20.5	1796.3	O K
360 min Summer	99.537	0.737	20.5	1861.3	O K
480 min Summer	99.545	0.745	20.5	1883.5	O K
600 min Summer	99.544	0.744	20.5	1879.6	O K
720 min Summer	99.536	0.736	20.5	1858.5	O K
960 min Summer	99.513	0.713	20.5	1794.9	O K
1440 min Summer	99.470	0.670	20.5	1675.6	O K
2160 min Summer	99.410	0.610	20.5	1512.2	O K
2880 min Summer	99.354	0.554	20.5	1361.7	O K
4320 min Summer	99.252	0.452	20.5	1094.0	O K
5760 min Summer	99.162	0.362	20.5	866.2	O K
7200 min Summer	99.087	0.287	20.5	679.5	O K
8640 min Summer	99.027	0.227	20.3	532.2	O K
10080 min Summer	98.980	0.180	20.0	419.4	O K
15 min Winter	99.200	0.400	20.5	960.7	O K
30 min Winter	99.313	0.513	20.5	1255.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	138.153	0.0	879.4	26	
30 min Summer	90.705	0.0	1155.5	41	
60 min Summer	56.713	0.0	1445.1	70	
120 min Summer	34.246	0.0	1745.1	130	
180 min Summer	25.149	0.0	1922.4	188	
240 min Summer	20.078	0.0	2046.9	248	
360 min Summer	14.585	0.0	2230.2	366	
480 min Summer	11.622	0.0	2369.6	484	
600 min Summer	9.738	0.0	2482.2	602	
720 min Summer	8.424	0.0	2577.0	720	
960 min Summer	6.697	0.0	2731.4	838	
1440 min Summer	4.839	0.0	2960.0	1070	
2160 min Summer	3.490	0.0	3202.8	1460	
2880 min Summer	2.766	0.0	3383.8	1852	
4320 min Summer	1.989	0.0	3651.6	2640	
5760 min Summer	1.573	0.0	3850.6	3400	
7200 min Summer	1.311	0.0	4009.8	4112	
8640 min Summer	1.129	0.0	4143.0	4760	
10080 min Summer	0.994	0.0	4257.6	5448	
15 min Winter	138.153	0.0	985.4	26	
30 min Winter	90.705	0.0	1294.2	40	
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File Storage Estimate Catchm...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	99.424	0.624	20.5	1549.6	O K
120 min Winter	99.525	0.725	20.5	1827.4	O K
180 min Winter	99.575	0.775	20.5	1968.2	O K
240 min Winter	99.604	0.804	20.5	2049.5	O K
360 min Winter	99.635	0.835	20.5	2138.7	O K
480 min Winter	99.649	0.849	20.5	2178.6	O K
600 min Winter	99.653	0.853	20.5	2189.4	O K
720 min Winter	99.650	0.850	20.5	2182.0	O K
960 min Winter	99.634	0.834	20.5	2134.6	O K
1440 min Winter	99.577	0.777	20.5	1974.5	O K
2160 min Winter	99.494	0.694	20.5	1740.2	O K
2880 min Winter	99.410	0.610	20.5	1512.3	O K
4320 min Winter	99.254	0.454	20.5	1101.4	O K
5760 min Winter	99.122	0.322	20.5	765.4	O K
7200 min Winter	99.020	0.220	20.3	514.4	O K
8640 min Winter	98.948	0.148	19.7	343.3	O K
10080 min Winter	98.906	0.106	19.1	244.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	56.713	0.0	1618.7	70	
120 min Winter	34.246	0.0	1955.2	128	
180 min Winter	25.149	0.0	2153.5	186	
240 min Winter	20.078	0.0	2292.6	244	
360 min Winter	14.585	0.0	2497.8	360	
480 min Winter	11.622	0.0	2654.4	474	
600 min Winter	9.738	0.0	2780.5	588	
720 min Winter	8.424	0.0	2885.7	702	
960 min Winter	6.697	0.0	3050.9	922	
1440 min Winter	4.839	0.0	3089.5	1202	
2160 min Winter	3.490	0.0	3587.6	1604	
2880 min Winter	2.766	0.0	3790.0	2028	
4320 min Winter	1.989	0.0	4090.3	2852	
5760 min Winter	1.573	0.0	4313.3	3576	
7200 min Winter	1.311	0.0	4490.4	4248	
8640 min Winter	1.129	0.0	4640.0	4848	
10080 min Winter	0.994	0.0	4768.8	5352	
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Innovyze	Source Control 2020.1	

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 %	+40

Time Area Diagram

Total Area (ha) 3.400

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	(ha)	From:	To:	(ha)
0	4	1.133	4	8	1.133
			8	12	1.134

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Date 17/03/2022 17:23	Designed by 17.03.22	
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Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	2267.0	1.200	3149.6

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0197-2050-1300-2050
Design Head (m)	1.300
Design Flow (l/s)	20.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	197
Invert Level (m)	98.700
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	20.5
Flush-Flo™	0.402	20.5
Kick-Flo®	0.883	17.1
Mean Flow over Head Range	-	17.6

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	6.8	1.200	19.7	3.000	30.6	7.000	46.0
0.200	18.4	1.400	21.2	3.500	32.9	7.500	47.6
0.300	20.2	1.600	22.6	4.000	35.1	8.000	49.1
0.400	20.5	1.800	23.9	4.500	37.2	8.500	50.6
0.500	20.3	2.000	25.2	5.000	39.1	9.000	52.0
0.600	20.0	2.200	26.3	5.500	40.9	9.500	53.4
0.800	18.6	2.400	27.5	6.000	42.7		
1.000	18.1	2.600	28.5	6.500	44.4		

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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North West Total FEH			
Date 29/03/2022 File Storage Estimate West C...		Designed by SC Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	99.132	0.332	32.5	1334.0	O K
30 min Summer	99.229	0.429	32.8	1738.9	O K
60 min Summer	99.325	0.525	32.8	2154.5	O K
120 min Summer	99.428	0.628	32.8	2604.7	O K
180 min Summer	99.489	0.689	32.8	2879.5	O K
240 min Summer	99.529	0.729	32.8	3060.6	O K
360 min Summer	99.573	0.773	32.8	3261.5	O K
480 min Summer	99.590	0.790	32.8	3338.8	O K
600 min Summer	99.593	0.793	32.8	3351.6	O K
720 min Summer	99.587	0.787	32.8	3325.3	O K
960 min Summer	99.565	0.765	32.8	3223.6	O K
1440 min Summer	99.520	0.720	32.8	3016.1	O K
2160 min Summer	99.455	0.655	32.8	2725.5	O K
2880 min Summer	99.397	0.597	32.8	2469.4	O K
4320 min Summer	99.303	0.503	32.8	2056.3	O K
5760 min Summer	99.230	0.430	32.8	1744.1	O K
7200 min Summer	99.176	0.376	32.7	1516.9	O K
8640 min Summer	99.136	0.336	32.5	1350.6	O K
10080 min Summer	99.106	0.306	32.3	1226.2	O K
15 min Winter	99.171	0.371	32.7	1496.3	O K
30 min Winter	99.278	0.478	32.8	1952.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	134.960	0.0	1150.6	26	
30 min Summer	88.480	0.0	1534.7	41	
60 min Summer	55.440	0.0	2114.5	70	
120 min Summer	34.230	0.0	2622.1	128	
180 min Summer	25.723	0.0	2957.8	188	
240 min Summer	20.895	0.0	3202.0	248	
360 min Summer	15.400	0.0	3531.3	366	
480 min Summer	12.270	0.0	3739.6	484	
600 min Summer	10.233	0.0	3884.9	602	
720 min Summer	8.797	0.0	3992.2	720	
960 min Summer	6.893	0.0	4136.2	832	
1440 min Summer	4.853	0.0	4270.2	1056	
2160 min Summer	3.408	0.0	4859.4	1448	
2880 min Summer	2.660	0.0	5050.2	1844	
4320 min Summer	1.900	0.0	5373.5	2604	
5760 min Summer	1.514	0.0	5820.9	3352	
7200 min Summer	1.285	0.0	6166.8	4104	
8640 min Summer	1.133	0.0	6510.3	4760	
10080 min Summer	1.026	0.0	6840.6	5456	
15 min Winter	134.960	0.0	1300.6	26	
30 min Winter	88.480	0.0	1724.0	40	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North West Total FEH			
Date 29/03/2022		Designed by SC			
File Storage Estimate West C...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	99.386	0.586	32.8	2420.8	O K
120 min Winter	99.501	0.701	32.8	2932.8	O K
180 min Winter	99.571	0.771	32.8	3248.8	O K
240 min Winter	99.617	0.817	32.8	3461.3	O K
360 min Winter	99.670	0.870	32.8	3707.1	O K
480 min Winter	99.692	0.892	32.8	3813.0	O K
600 min Winter	99.700	0.900	32.8	3846.5	O K
720 min Winter	99.698	0.898	32.8	3837.9	O K
960 min Winter	99.678	0.878	32.8	3746.2	O K
1440 min Winter	99.612	0.812	32.8	3438.2	O K
2160 min Winter	99.523	0.723	32.8	3032.4	O K
2880 min Winter	99.439	0.639	32.8	2656.5	O K
4320 min Winter	99.298	0.498	32.8	2035.6	O K
5760 min Winter	99.190	0.390	32.8	1575.8	O K
7200 min Winter	99.115	0.315	32.4	1263.6	O K
8640 min Winter	99.066	0.266	31.7	1060.1	O K
10080 min Winter	99.040	0.240	30.6	954.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	55.440	0.0	2375.2	70	
120 min Winter	34.230	0.0	2940.6	126	
180 min Winter	25.723	0.0	3312.8	184	
240 min Winter	20.895	0.0	3581.6	244	
360 min Winter	15.400	0.0	3939.2	360	
480 min Winter	12.270	0.0	4160.2	476	
600 min Winter	10.233	0.0	4309.8	590	
720 min Winter	8.797	0.0	4415.5	702	
960 min Winter	6.893	0.0	4542.5	922	
1440 min Winter	4.853	0.0	4610.8	1154	
2160 min Winter	3.408	0.0	5445.7	1584	
2880 min Winter	2.660	0.0	5659.7	2016	
4320 min Winter	1.900	0.0	6029.3	2812	
5760 min Winter	1.514	0.0	6524.6	3520	
7200 min Winter	1.285	0.0	6913.6	4184	
8640 min Winter	1.133	0.0	7301.4	4840	
10080 min Winter	1.026	0.0	7678.9	5440	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North West Total FEH	
Date 29/03/2022	Designed by SC	
File Storage Estimate West C...	Checked by	
Innovyze	Source Control 2020.1	

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 441450 298000 SP 41450 98000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 5.380

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4	1.793	4 8	1.793	8 12	1.794

BWB Consulting Ltd		Page 4
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North West Total FEH	
Date 29/03/2022	Designed by SC	
File Storage Estimate West C...	Checked by	
Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	3866.0	0.920	4719.7	1.200	4996.4
0.900	4700.2	0.952	4750.9		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0244-3280-1200-3280
Design Head (m)	1.200
Design Flow (l/s)	32.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	244
Invert Level (m)	98.800
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	32.8
Flush-Flo™	0.415	32.8
Kick-Flo®	0.867	28.1
Mean Flow over Head Range	-	27.6

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	8.0	1.200	32.8	3.000	51.0	7.000	76.9
0.200	24.8	1.400	35.3	3.500	54.9	7.500	79.5
0.300	32.2	1.600	37.6	4.000	58.6	8.000	82.1
0.400	32.8	1.800	39.8	4.500	62.0	8.500	84.5
0.500	32.6	2.000	41.9	5.000	65.3	9.000	86.9
0.600	32.1	2.200	43.9	5.500	68.4	9.500	89.2
0.800	29.9	2.400	45.8	6.000	71.3		
1.000	30.1	2.600	47.6	6.500	74.2		

BWB Consulting Ltd					Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North West Total FSR			
Date 29/03/2022		Designed by SC			
File Storage Estimate West C...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	99.140	0.340	32.6	1365.9	O K
30 min Summer	99.239	0.439	32.8	1783.5	O K
60 min Summer	99.337	0.537	32.8	2205.5	O K
120 min Summer	99.428	0.628	32.8	2605.9	O K
180 min Summer	99.474	0.674	32.8	2810.9	O K
240 min Summer	99.501	0.701	32.8	2930.5	O K
360 min Summer	99.531	0.731	32.8	3066.4	O K
480 min Summer	99.545	0.745	32.8	3131.8	O K
600 min Summer	99.550	0.750	32.8	3153.5	O K
720 min Summer	99.548	0.748	32.8	3146.4	O K
960 min Summer	99.540	0.740	32.8	3107.3	O K
1440 min Summer	99.517	0.717	32.8	3004.6	O K
2160 min Summer	99.475	0.675	32.8	2814.1	O K
2880 min Summer	99.428	0.628	32.8	2607.2	O K
4320 min Summer	99.337	0.537	32.8	2206.2	O K
5760 min Summer	99.256	0.456	32.8	1855.3	O K
7200 min Summer	99.188	0.388	32.8	1568.0	O K
8640 min Summer	99.134	0.334	32.5	1342.0	O K
10080 min Summer	99.092	0.292	32.1	1168.7	O K
15 min Winter	99.180	0.380	32.7	1532.1	O K
30 min Winter	99.290	0.490	32.8	2002.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	138.153	0.0	1180.3	26	
30 min Summer	90.705	0.0	1574.7	41	
60 min Summer	56.713	0.0	2164.5	70	
120 min Summer	34.246	0.0	2623.3	128	
180 min Summer	25.149	0.0	2891.3	188	
240 min Summer	20.078	0.0	3076.9	246	
360 min Summer	14.585	0.0	3347.3	364	
480 min Summer	11.622	0.0	3548.1	484	
600 min Summer	9.738	0.0	3705.4	602	
720 min Summer	8.424	0.0	3833.6	718	
960 min Summer	6.697	0.0	4030.0	816	
1440 min Summer	4.839	0.0	4260.3	1054	
2160 min Summer	3.490	0.0	4978.2	1452	
2880 min Summer	2.766	0.0	5251.2	1852	
4320 min Summer	1.989	0.0	5628.8	2640	
5760 min Summer	1.573	0.0	6050.9	3400	
7200 min Summer	1.311	0.0	6291.8	4104	
8640 min Summer	1.129	0.0	6483.8	4760	
10080 min Summer	0.994	0.0	6625.4	5448	
15 min Winter	138.153	0.0	1333.5	26	
30 min Winter	90.705	0.0	1767.7	40	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Hinckley North West Total FSR			
Date 29/03/2022		Designed by SC			
File Storage Estimate West C...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	99.399	0.599	32.8	2478.0	O K
120 min Winter	99.501	0.701	32.8	2934.2	O K
180 min Winter	99.554	0.754	32.8	3171.5	O K
240 min Winter	99.585	0.785	32.8	3314.2	O K
360 min Winter	99.622	0.822	32.8	3484.6	O K
480 min Winter	99.642	0.842	32.8	3577.2	O K
600 min Winter	99.652	0.852	32.8	3621.9	O K
720 min Winter	99.654	0.854	32.8	3635.0	O K
960 min Winter	99.647	0.847	32.8	3600.1	O K
1440 min Winter	99.609	0.809	32.8	3424.0	O K
2160 min Winter	99.547	0.747	32.8	3142.0	O K
2880 min Winter	99.477	0.677	32.8	2826.8	O K
4320 min Winter	99.339	0.539	32.8	2214.0	O K
5760 min Winter	99.219	0.419	32.8	1698.9	O K
7200 min Winter	99.127	0.327	32.5	1312.2	O K
8640 min Winter	99.064	0.264	31.7	1053.1	O K
10080 min Winter	99.033	0.233	29.7	926.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	56.713	0.0	2430.9	70	
120 min Winter	34.246	0.0	2942.0	126	
180 min Winter	25.149	0.0	3239.3	184	
240 min Winter	20.078	0.0	3444.3	242	
360 min Winter	14.585	0.0	3740.5	358	
480 min Winter	11.622	0.0	3957.4	474	
600 min Winter	9.738	0.0	4124.2	588	
720 min Winter	8.424	0.0	4256.5	700	
960 min Winter	6.697	0.0	4447.3	918	
1440 min Winter	4.839	0.0	4605.5	1150	
2160 min Winter	3.490	0.0	5578.1	1588	
2880 min Winter	2.766	0.0	5883.9	2024	
4320 min Winter	1.989	0.0	6312.1	2820	
5760 min Winter	1.573	0.0	6782.2	3576	
7200 min Winter	1.311	0.0	7053.7	4248	
8640 min Winter	1.129	0.0	7271.8	4840	
10080 min Winter	0.994	0.0	7437.7	5440	
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BWB Consulting Ltd		Page 3
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North West Total FSR	
Date 29/03/2022	Designed by SC	
File Storage Estimate West C...	Checked by	
Innovyze	Source Control 2020.1	

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 %	+40

Time Area Diagram

Total Area (ha) 5.380

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	(ha)	From:	To:	(ha)
0	4	1.793	4	8	1.793
				8	12
					1.794

BWB Consulting Ltd		Page 4
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	Hinckley North West Total FSR	
Date 29/03/2022	Designed by SC	
File Storage Estimate West C...	Checked by	
Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
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0.900	4700.2	0.952	4750.9		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0244-3280-1200-3280
Design Head (m)	1.200
Design Flow (l/s)	32.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	244
Invert Level (m)	98.800
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	32.8
Flush-Flo™	0.415	32.8
Kick-Flo®	0.867	28.1
Mean Flow over Head Range	-	27.6

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	8.0	1.200	32.8	3.000	51.0	7.000	76.9
0.200	24.8	1.400	35.3	3.500	54.9	7.500	79.5
0.300	32.2	1.600	37.6	4.000	58.6	8.000	82.1
0.400	32.8	1.800	39.8	4.500	62.0	8.500	84.5
0.500	32.6	2.000	41.9	5.000	65.3	9.000	86.9
0.600	32.1	2.200	43.9	5.500	68.4	9.500	89.2
0.800	29.9	2.400	45.8	6.000	71.3		
1.000	30.1	2.600	47.6	6.500	74.2		

Appendix 7: MicroDrainage Post-Development Greenfield Runoff Volume

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		
Date 17/03/2022 17:35	Designed by Sam.Cooper	
File Storage Estimate Catchm...	Checked by	
Innovyze	Source Control 2020.1	

Greenfield Runoff Volume

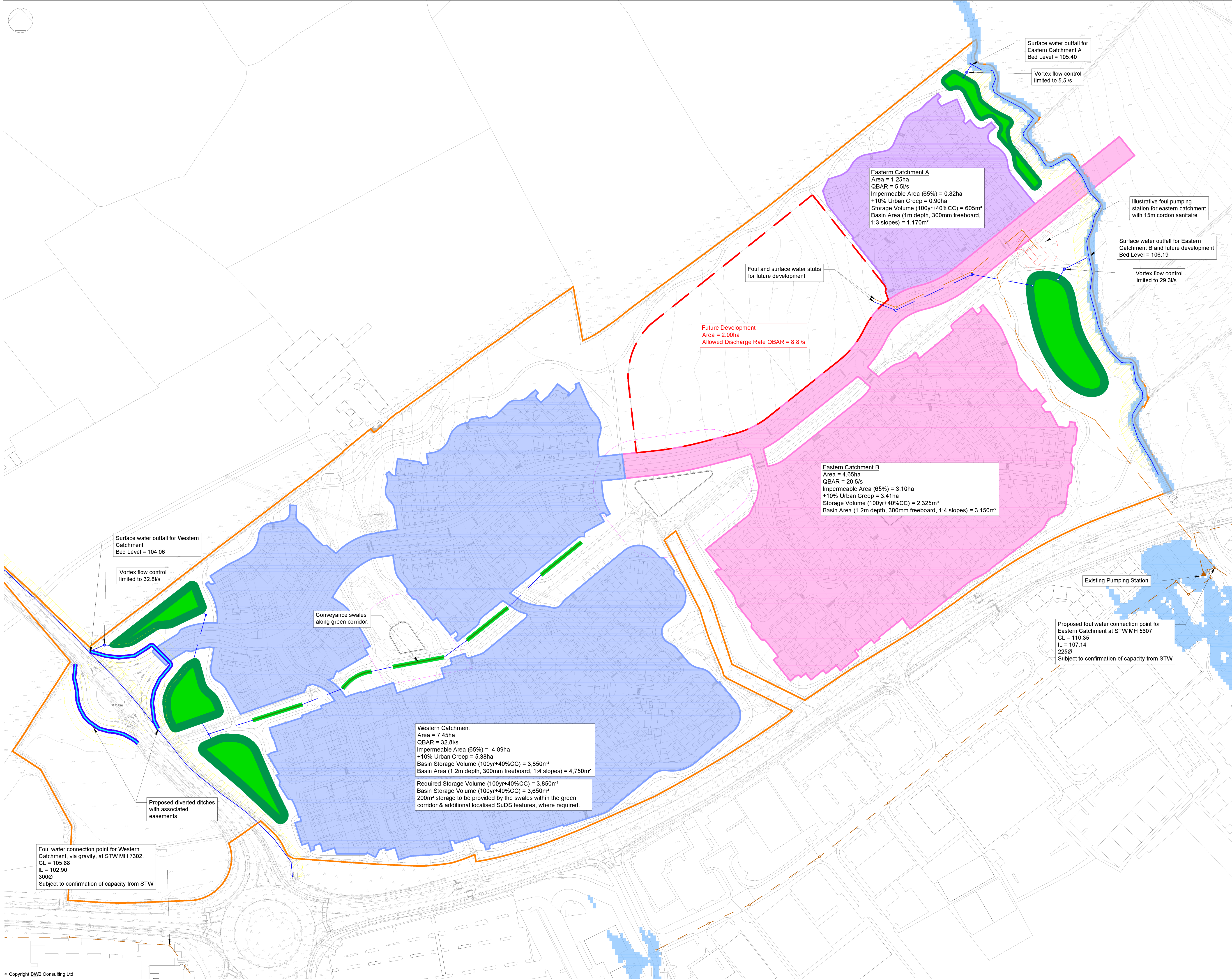
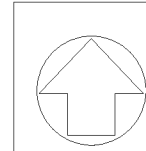
FEH Data

Return Period (years)	100
Storm Duration (mins)	360
FEH Rainfall Version	2013
Site Location	GB 441450 298000 SP 41450 98000
Data Type	Catchment
Areal Reduction Factor	1.00
Area (ha)	16.010
SAAR (mm)	700
CWI	105.000
SPR Host	42.870
URBEXT (1990)	0.0997

Results

Percentage Runoff (%)	43.97
Greenfield Runoff Volume (m ³)	4646.406

Appendix 8: Indicative Surface and Foul Water Layout



Notes

- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.
- Based on topographical survey 42117_T_REV0.
- The 1 in 1000-year fluvial flood extent is based on a site-specific detailed hydraulic modeling exercise completed by BWB Consulting in March 2022.
- Locations of existing public sewerage infrastructure based on Severn Trent Water asset records. The accuracy of the sewers shown on this drawing cannot be guaranteed and is only an indicative representation. It is given without liability or warranty.
- The impermeable area is based on an estimation of 65% impermeability, with a 10% allowance for urban creep. The allowances for urban creep should be confirmed once the development density is finalised.
- The greenfield runoff rate for the site is based upon 4.4l/s/ha.
- Outfall to watercourses subject to Land Drainage Consent.
- This drawing should be read in conjunction with BWB Sustainable Drainage Statement HIN-BWB-ZZ-XX-RP-CD-0001_SDS.
- Drawing intended for planning purposes only. Do not construct from this drawing. Subject to consent, approval and detailed design.

Legend

- Illustrative Site Boundary
- Existing
 - Watercourse
 - Illustrative Watercourse Easement (8m from top of bank)
 - Existing Surface Water Sewer
 - Existing Foul Water Sewer
 - Modelled Flood Extent (1000-year)
- Proposed
 - Western Catchment
 - Eastern Catchment A
 - Eastern Catchment B
 - Future Development
 - Detention Basin
 - Ditch Diversion
 - Illustrative Outfall Sewer
 - Headwall
 - Swale
 - Foul Pumping Station
 - Foul Rising Main

P01	29.03.22	Preliminary Issue	SC	CT
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

BWB
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□ Leeds | 0113 233 8000
□ London | 020 7407 3879
□ Manchester | 0161 233 4260
□ Nottingham | 0115 924 1100
www.bwbconsulting.com

Client
Richborough Estates and Mr & Mrs Adcock

Project Title
Hinckley North

Drawing Title
Illustrative Drainage Strategy

Drawn: S. Cooper Reviewed: C. Thorpe

BWB Ref: 210683 Date: 29.03.22 Scale@A1: 1:1250

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number Status Rev

HIN-BWB-ZZ-XX-DR-CD-0001 S2 P01

Appendix 9: STW Pre Development Enquiry

WONDERFUL ON TAP



BWB Consulting
35 LIVERY STREET
BIRMINGHAM
B3 2PB

Severn Trent Water Ltd

Leicester Water Centre
Gorse Hill
Anstey
Leicester
LE7 7GU

www.stwater.co.uk

20th January 2022

Dear Sir/Madam,

**Proposed Development: (288 dwellings) – Normandy Way,
Hinckley, Leicestershire, LE10 1YA - 441977, 295649**

I refer to your 'Development Enquiry Request' in respect of the above-named site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) which refer to surface water disposal from development sites.

Protective Strip

No public sewers within site boundary.

Due to a change in legislation on 1 October 2011 there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records, but are located in your client's land. These sewers would require protective strips of 3 metres either side of the sewer's centreline that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Foul Water Drainage

Records show the 300mm pipe to the south-west (MH SP41957302) is the most suitable connection point for your development. Land contour suggests portion of site may require a pump solution. Pump

flows will have an impact to the downstream network, specifically to “Hinckley-Stke Road 2 SPS”.

Note, due to the size of development and the pump flows to the network, modelling will be required. Modelling will determine the impact of the new flows on the existing system and whether the flows can be accommodated prior to any potential capacity works that may need to take place.

In a change to our previous process, we no longer charge developers for the hydraulic modelling service. We will liaise with you over time with regards to the outcome of our investigations and any impact that may have on the planning status, occupation, or phasing of the site. However, while we can provide a brief summary of our findings if you need us to, we will no longer provide the full external capacity assessment report.

From the application you have submitted, I am assuming that the development has not been granted planning approval. Please inform us as and when planning has progressed as this will help determine how quick we carry out the modelling exercise. In the meantime, the site will be added to our modelling tracker and reviewed regularly until the site can be progressed for sewer modelling.

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2000, the disposal of surface water by means of soakaways should be considered as the primary method. If these are found to be unsuitable, satisfactory evidence will need to be submitted. The evidence should be either percolation test results or by the submission of a statement from the SI consultant (extract or a supplementary letter).

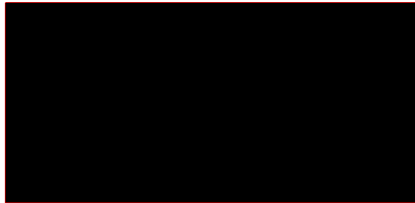
Severn Trent Water expects all surface water from the development to be drained in a sustainable way to the nearest watercourse or land drainage channel, subject to the developer discussing all aspects of the developments surface water drainage with the Local Lead Flood Authority (LLFA). Any discharge rate to a watercourse or drainage ditch will be determined by the LLFA / EA.

Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit a Section 106 application form. Our Developer Services department are responsible for handling all new connections enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 7076600 or download from www.stwater.co.uk.

Please quote the above reference in any future correspondence (including e-mails) with STW Limited. Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours sincerely



Belal Ali
Network Solutions
Developer Services

