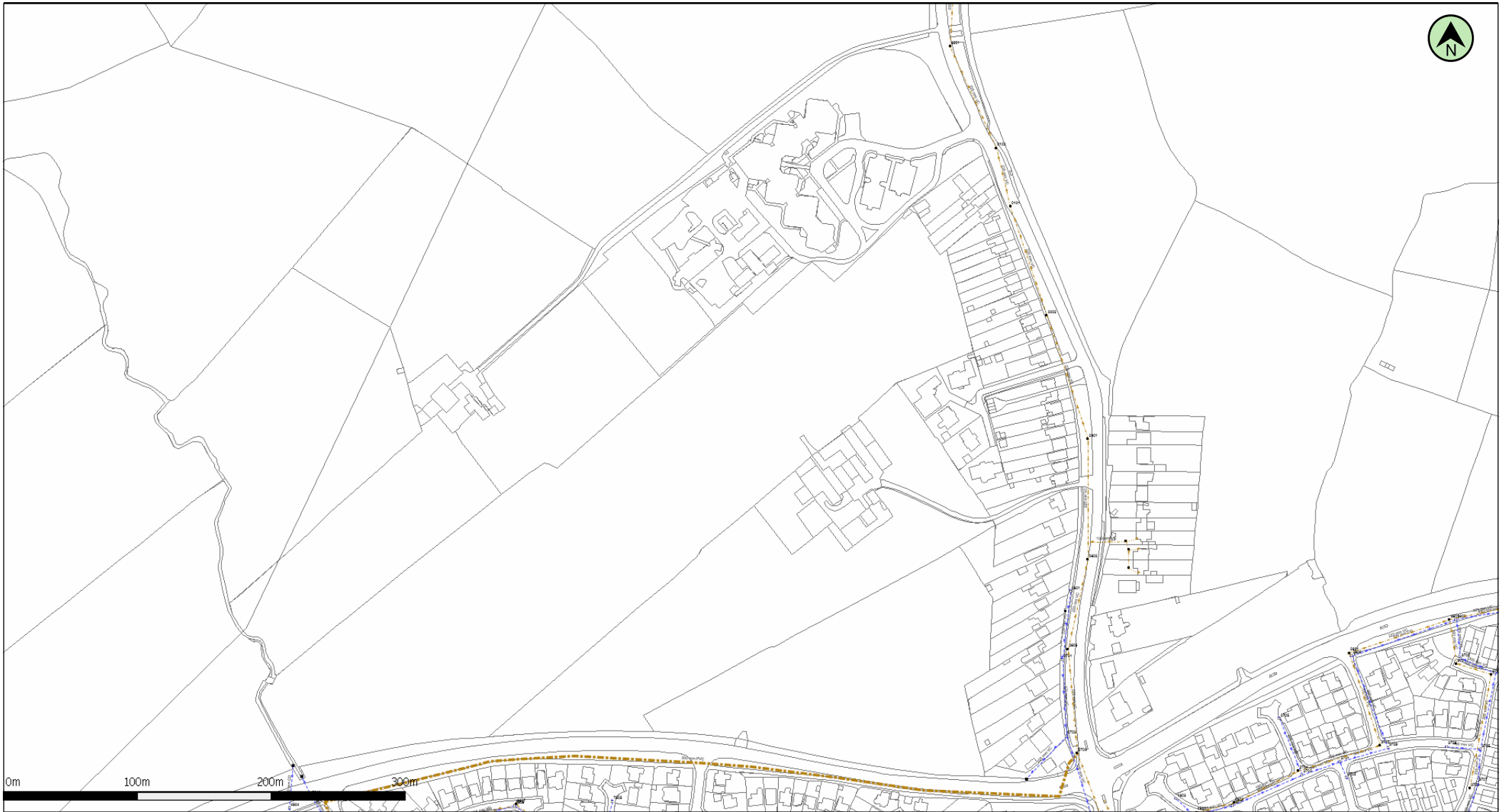


Appendix 3: Severn Trent Water Sewer Records and Developer Enquiry



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Date: 05/07/23

Scale: 1:4032

Map Centre: 442842,295986

Data updated: 14/06/23

Wastewater Plan A4

Do not scale off this map. The 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. Reproduction by permission of Ordnance Survey on behalf of HMSO. ©Crown Copyright and database rights 2023. All rights reserved. Ordnance Survey licence number 100031673. 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.

Public Foul Gravity/Lateral Drain		Highway Drain		Manhole Foul	
Public Combined Gravity/Lateral Drain		Overflow Pipe		Manhole Surface	
Public Surface Water Gravity/Lateral Drain		Disposal Pipe		Abandoned Pipe	
Pressure Foul		Culverted Water Course		Chamber	
Pressure Combined		Pumping Station			
Pressure Surface Water		Fitting			

Section 104 sewers are shown in green
Private sewers are shown in magenta

corinna.haill@bwbconsulting.com



GENERAL CONDITIONS AND PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK ADJACENT TO SEVERN TRENT WATER'S APPARATUS

Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Severn Trent Water Limited (STW) apparatus (defined below), the person, contractor or subcontractor responsible must inform STW immediately on:

0800 783 4444 (24 hours)

- a) These general conditions and precautions apply to the public sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991 (a legal agreement between a developer and STW, where a developer agrees to build sewers to an agreed standard, which STW will then adopt); mains installed in accordance with an agreement for the self-construction of water mains entered into with STW and the assets described at condition b) of these general conditions and precautions. Such apparatus is referred to as "STW Apparatus" in these general conditions and precautions.
- b) Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.
- c) On request, STW will issue a copy of the plan showing the approximate locations of STW Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and STW does not guarantee its accuracy.
- d) STW does not update these plans on a regular basis. Therefore the position and depth of STW Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.
- e) The plan must not be relied upon in the event of excavations or other works in the vicinity of STW Apparatus. It is your responsibility to ascertain the precise location of any STW Apparatus prior to undertaking any development or other works (including but not limited to excavations).
- f) No person or company shall be relieved from liability for loss and/or damage caused to STW Apparatus by reason of the actual position and/or depths of STW Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any STW Apparatus the following should be observed:

1. All STW Apparatus should be located by hand digging prior to the use of mechanical excavators.
2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to STW Apparatus. You or your contractor must ensure the safety of STW Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).
3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.

4. During construction work, where heavy plant will cross the line of STW Apparatus, specific crossing points must be agreed with STW and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of STW Apparatus at other locations must be prevented.
5. Where it is proposed to carry out piling or boring within 20 metres of any STW Apparatus, STW should be consulted to enable any affected STW Apparatus to be surveyed prior to the works commencing.
6. Where excavation of trenches adjacent to any STW Apparatus affects its support, the STW Apparatus must be supported to the satisfaction of STW. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.
7. Where a trench is excavated crossing or parallel to the line of any STW Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the STW Apparatus. In special cases, it may be necessary to provide permanent support to STW Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the STW Apparatus.
8. No other apparatus should be laid along the line of STW Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of STW Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any STW Apparatus.
9. A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing STW Apparatus. We reserve the right to increase this distance where strategic assets are affected.
10. Where any STW Apparatus coated with a special wrapping is damaged, even to a minor extent, STW must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any STW Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.
11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with STW Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such STW Apparatus in order to determine any necessary alterations in advance of the works.
12. With regard to any proposed resurfacing works, you are required to contact STW on the number given above to arrange a site inspection to establish the condition of any STW Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. STW will then advise on any measures to be taken, in the event of this a proportionate charge will be made.
13. You are advised that STW will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,
14. No explosives are to be used in the vicinity of any STW Apparatus without prior consultation with STW.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other STW Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other STW Apparatus.

15. Please ensure that, in relation to STW Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.
16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other STW Apparatus.

17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other STW Apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May2014

18. STW personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other STW Apparatus.

19. In certain circumstances, both STW and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main or other STW Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

WONDERFUL ON TAP



13th July 2023

BWB Consulting
Westminster House
11 Portland Street
Manchester
M1 3HU

Severn Trent Water Ltd
Oxley Moor Road
Wolverhampton
WV9 5HN

www.stwater.co.uk

Email:
Network.Solutions@SevernTrent.co.uk

Dear Corinna

Our ref: 1088230

Proposed Development: Normandy Way Hinckley

I refer to your 'Development Enquiry Request' of 475 houses 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

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 also have protective strips 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

A foul connection into highway south Drake Way m/h 7602 or Nelson Dr m/h 5607 into the 225mm fws, Flows @ 7.4l/s 2xdwf but due to surcharge levels and the expected additional flows into the network downstream and pump station then additional investigation/modelling will be required.

Due to the performance of the downstream network, modelling will be required to better understand the impact of the additional properties on the public network..

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. In the meantime, the site will be added to our modelling tracker and reviewed regularly until the site can be progressed for sewer modelling. I would therefore be grateful if you would forward as soon as possible the following details:

- Confirmation whether a pumped solution is required (please provide pump rate and frequency, if available)
- Anticipated flow rate from the site
- Proposed planned start and completion date
- Any phasing details of the proposed development
- Confirm how many properties will discharge into each of the connections to the public sewer.
- Planned occupation date

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).

Subject to above 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, including highway drainage etc. 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.

New 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 707 6600 or download from www.stwater.co.uk.

Please quote the reference 1088230 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,

Michael Taylor
Network Solutions
Developer Services

Appendix 4: Existing Runoff Rate and Volume

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	232746 Hinckley North Phase 2 Greenfield Runoff Rate	
Date 19/07/2023 10:00 File	Designed by L. Reeves Checked by C. Dodd	
Innovyze Source Control 2020.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	1.000	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

Results l/s

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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BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	232746 Land North of Normandy Way and West of Ashby Road Greenfield Runoff Volume	
Date 04/03/2024 12:23 File Catchment 4 100yr 40CC ...	Designed by L. Reeves Checked by C. Dodd	
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 441950 296750 SP 41950 96750
Data Type	Catchment
Areal Reduction Factor	1.00
Area (ha)	11.400
SAAR (mm)	654
CWI	96.720
SPR Host	44.670
URBEXT (1990)	0.2394

Results

Percentage Runoff (%)	46.06
Greenfield Runoff Volume (m ³)	3434.325

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Appendix 5: Proposed Storage Requirements

BWB Consulting Ltd					Page 1	
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		232746 Land North of Normandy Way and West of Ashby Road Catchment 1 FEH Storage				
Date 05/01/2024 16:04 File Catchment 1 100yr 40CC ...		Designed by L. Reeves Checked by C. Dodd				
Innovyze		Source Control 2020.1				
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		99.044	0.444	5.7	220.7	O K
30 min Summer		99.154	0.554	5.7	288.3	O K
60 min Summer		99.256	0.656	5.7	356.2	O K
120 min Summer		99.354	0.754	5.7	426.0	O K
180 min Summer		99.410	0.810	5.7	468.0	O K
240 min Summer		99.445	0.845	5.7	494.6	O K
360 min Summer		99.479	0.879	5.7	521.2	O K
480 min Summer		99.488	0.888	5.7	528.7	O K
600 min Summer		99.484	0.884	5.7	525.9	O K
720 min Summer		99.473	0.873	5.7	517.0	O K
960 min Summer		99.444	0.844	5.7	493.9	O K
1440 min Summer		99.390	0.790	5.7	452.2	O K
2160 min Summer		99.315	0.715	5.7	397.8	O K
2880 min Summer		99.247	0.647	5.7	349.6	O K
4320 min Summer		99.118	0.518	5.7	265.6	O K
5760 min Summer		99.019	0.419	5.7	206.1	O K
7200 min Summer		98.943	0.343	5.7	163.5	O K
8640 min Summer		98.886	0.286	5.7	132.9	O K
10080 min Summer		98.843	0.243	5.6	111.0	O K
15 min Winter		99.089	0.489	5.7	247.9	O K
30 min Winter		99.209	0.609	5.7	324.1	O K
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer		134.400	0.0	221.6	26	
30 min Summer		88.200	0.0	290.8	41	
60 min Summer		55.160	0.0	369.8	70	
120 min Summer		33.880	0.0	454.4	130	
180 min Summer		25.452	0.0	512.0	188	
240 min Summer		20.685	0.0	554.7	246	
360 min Summer		15.260	0.0	613.4	366	
480 min Summer		12.188	0.0	652.8	484	
600 min Summer		10.182	0.0	681.2	602	
720 min Summer		8.762	0.0	702.8	718	
960 min Summer		6.866	0.0	732.7	818	
1440 min Summer		4.848	0.0	769.1	1062	
2160 min Summer		3.409	0.0	826.8	1472	
2880 min Summer		2.663	0.0	860.9	1880	
4320 min Summer		1.903	0.0	922.2	2636	
5760 min Summer		1.517	0.0	982.0	3352	
7200 min Summer		1.287	0.0	1041.2	4040	
8640 min Summer		1.134	0.0	1100.9	4752	
10080 min Summer		1.026	0.0	1161.0	5448	
15 min Winter		134.400	0.0	248.3	26	
30 min Winter		88.200	0.0	325.2	40	
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BWB Consulting Ltd					Page 2
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		232746 Land North of Normandy Way and West of Ashby Road Catchment 1 FEH Storage			
Date 05/01/2024 16:04 File Catchment 1 100yr 40CC ...		Designed by L. Reeves Checked by C. Dodd			
Innovyze		Source Control 2020.1			
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
60 min Winter	99.320	0.720	5.7	400.7	O K
120 min Winter	99.426	0.826	5.7	480.3	O K
180 min Winter	99.488	0.888	5.7	529.0	O K
240 min Winter	99.527	0.927	5.7	560.7	O K
360 min Winter	99.567	0.967	5.7	594.0	O K
480 min Winter	99.581	0.981	5.7	605.8	O K
600 min Winter	99.581	0.981	5.7	606.0	O K
720 min Winter	99.573	0.973	5.7	599.3	O K
960 min Winter	99.544	0.944	5.7	574.3	O K
1440 min Winter	99.479	0.879	5.7	521.4	O K
2160 min Winter	99.386	0.786	5.7	449.6	O K
2880 min Winter	99.295	0.695	5.7	383.4	O K
4320 min Winter	99.101	0.501	5.7	255.2	O K
5760 min Winter	98.951	0.351	5.7	167.6	O K
7200 min Winter	98.847	0.247	5.6	112.8	O K
8640 min Winter	98.782	0.182	5.4	80.8	O K
10080 min Winter	98.744	0.144	5.2	62.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	55.160	0.0	414.3	70	
120 min Winter	33.880	0.0	508.9	126	
180 min Winter	25.452	0.0	573.3	184	
240 min Winter	20.685	0.0	620.9	242	
360 min Winter	15.260	0.0	686.4	358	
480 min Winter	12.188	0.0	730.0	472	
600 min Winter	10.182	0.0	761.1	586	
720 min Winter	8.762	0.0	784.5	696	
960 min Winter	6.866	0.0	815.3	906	
1440 min Winter	4.847	0.0	834.3	1128	
2160 min Winter	3.409	0.0	926.0	1584	
2880 min Winter	2.663	0.0	964.2	2048	
4320 min Winter	1.903	0.0	1033.2	2812	
5760 min Winter	1.517	0.0	1100.0	3512	
7200 min Winter	1.287	0.0	1166.3	4112	
8640 min Winter	1.134	0.0	1233.2	4760	
10080 min Winter	1.026	0.0	1300.9	5352	
©1982-2020 Innovyze					

BWB Consulting Ltd		Page 3
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	232746 Land North of Normandy Way and West of Ashby Road Catchment 1 FEH Storage	
Date 05/01/2024 16:04 File Catchment 1 100yr 40CC ...	Designed by L. Reeves Checked by C. Dodd	
Innovyze Source Control 2020.1		
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BWB Consulting Ltd		Page 4																																																																																																			
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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) 98.600 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>409.8</td><td>1.000</td><td>861.8</td><td>1.400</td><td>1071.6</td></tr></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0112-5700-1000-5700 Design Head (m)1.000 Design Flow (l/s)5.7 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)112 Invert Level (m)98.600 Minimum Outlet Pipe Diameter (mm)150 Suggested Manhole Diameter (mm)1200 <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.000</td><td>5.7</td></tr><tr><td>Flush-Flo™</td><td>0.296</td><td>5.7</td></tr><tr><td>Kick-Flo®</td><td>0.642</td><td>4.6</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>4.9</td></tr></table> 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 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>3.9</td><td>1.200</td><td>6.2</td><td>3.000</td><td>9.5</td><td>7.000</td><td>14.3</td></tr><tr><td>0.200</td><td>5.5</td><td>1.400</td><td>6.7</td><td>3.500</td><td>10.3</td><td>7.500</td><td>14.7</td></tr><tr><td>0.300</td><td>5.7</td><td>1.600</td><td>7.1</td><td>4.000</td><td>10.9</td><td>8.000</td><td>15.2</td></tr><tr><td>0.400</td><td>5.6</td><td>1.800</td><td>7.5</td><td>4.500</td><td>11.6</td><td>8.500</td><td>15.7</td></tr><tr><td>0.500</td><td>5.4</td><td>2.000</td><td>7.9</td><td>5.000</td><td>12.2</td><td>9.000</td><td>16.1</td></tr><tr><td>0.600</td><td>5.0</td><td>2.200</td><td>8.2</td><td>5.500</td><td>12.7</td><td>9.500</td><td>16.5</td></tr><tr><td>0.800</td><td>5.1</td><td>2.400</td><td>8.6</td><td>6.000</td><td>13.3</td><td></td><td></td></tr><tr><td>1.000</td><td>5.7</td><td>2.600</td><td>8.9</td><td>6.500</td><td>13.8</td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	409.8	1.000	861.8	1.400	1071.6	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.000	5.7	Flush-Flo™	0.296	5.7	Kick-Flo®	0.642	4.6	Mean Flow over Head Range	-	4.9	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	3.9	1.200	6.2	3.000	9.5	7.000	14.3	0.200	5.5	1.400	6.7	3.500	10.3	7.500	14.7	0.300	5.7	1.600	7.1	4.000	10.9	8.000	15.2	0.400	5.6	1.800	7.5	4.500	11.6	8.500	15.7	0.500	5.4	2.000	7.9	5.000	12.2	9.000	16.1	0.600	5.0	2.200	8.2	5.500	12.7	9.500	16.5	0.800	5.1	2.400	8.6	6.000	13.3			1.000	5.7	2.600	8.9	6.500	13.8		
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0.300	5.7	1.600	7.1	4.000	10.9	8.000	15.2																																																																																														
0.400	5.6	1.800	7.5	4.500	11.6	8.500	15.7																																																																																														
0.500	5.4	2.000	7.9	5.000	12.2	9.000	16.1																																																																																														
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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	99.336	0.736	5.7	412.3	O K	
120 min Winter	99.434	0.834	5.7	485.8	O K	
180 min Winter	99.480	0.880	5.7	522.3	O K	
240 min Winter	99.506	0.906	5.7	543.0	O K	
360 min Winter	99.532	0.932	5.7	564.8	O K	
480 min Winter	99.543	0.943	5.7	573.7	O K	
600 min Winter	99.544	0.944	5.7	574.9	O K	
720 min Winter	99.540	0.940	5.7	571.4	O K	
960 min Winter	99.522	0.922	5.7	556.3	O K	
1440 min Winter	99.477	0.877	5.7	520.1	O K	
2160 min Winter	99.408	0.808	5.7	466.0	O K	
2880 min Winter	99.333	0.733	5.7	410.6	O K	
4320 min Winter	99.152	0.552	5.7	286.9	O K	
5760 min Winter	98.987	0.387	5.7	187.7	O K	
7200 min Winter	98.860	0.260	5.7	119.7	O K	
8640 min Winter	98.779	0.179	5.4	79.6	O K	
10080 min Winter	98.734	0.134	5.1	58.4	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)		
60 min Winter	56.713	0.0	426.0	70		
120 min Winter	34.246	0.0	514.4	126		
180 min Winter	25.149	0.0	566.5	184		
240 min Winter	20.078	0.0	602.8	242		
360 min Winter	14.585	0.0	656.3	358		
480 min Winter	11.622	0.0	696.7	472		
600 min Winter	9.738	0.0	728.8	584		
720 min Winter	8.424	0.0	755.4	694		
960 min Winter	6.697	0.0	797.0	904		
1440 min Winter	4.839	0.0	833.8	1126		
2160 min Winter	3.490	0.0	948.1	1588		
2880 min Winter	2.766	0.0	1001.4	2052		
4320 min Winter	1.989	0.0	1079.9	2856		
5760 min Winter	1.573	0.0	1141.0	3528		
7200 min Winter	1.311	0.0	1188.0	4176		
8640 min Winter	1.129	0.0	1227.1	4752		
10080 min Winter	0.994	0.0	1260.3	5256		
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Model Details Storage is Online Cover Level (m) 100.000 Tank or Pond Structure Invert Level (m) 98.600 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>409.8</td><td>1.000</td><td>861.8</td><td>1.400</td><td>1071.6</td></tr></tbody></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0112-5700-1000-5700 Design Head (m)1.000 Design Flow (l/s)5.7 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)112 Invert Level (m)98.600 Minimum Outlet Pipe Diameter (mm)150 Suggested Manhole Diameter (mm)1200 <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>1.000</td><td>5.7</td></tr><tr><td>Flush-Flo™</td><td>0.296</td><td>5.7</td></tr><tr><td>Kick-Flo®</td><td>0.642</td><td>4.6</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>4.9</td></tr></tbody></table> 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 <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>3.9</td><td>1.200</td><td>6.2</td><td>3.000</td><td>9.5</td><td>7.000</td><td>14.3</td></tr><tr><td>0.200</td><td>5.5</td><td>1.400</td><td>6.7</td><td>3.500</td><td>10.3</td><td>7.500</td><td>14.7</td></tr><tr><td>0.300</td><td>5.7</td><td>1.600</td><td>7.1</td><td>4.000</td><td>10.9</td><td>8.000</td><td>15.2</td></tr><tr><td>0.400</td><td>5.6</td><td>1.800</td><td>7.5</td><td>4.500</td><td>11.6</td><td>8.500</td><td>15.7</td></tr><tr><td>0.500</td><td>5.4</td><td>2.000</td><td>7.9</td><td>5.000</td><td>12.2</td><td>9.000</td><td>16.1</td></tr><tr><td>0.600</td><td>5.0</td><td>2.200</td><td>8.2</td><td>5.500</td><td>12.7</td><td>9.500</td><td>16.5</td></tr><tr><td>0.800</td><td>5.1</td><td>2.400</td><td>8.6</td><td>6.000</td><td>13.3</td><td></td><td></td></tr><tr><td>1.000</td><td>5.7</td><td>2.600</td><td>8.9</td><td>6.500</td><td>13.8</td><td></td><td></td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	409.8	1.000	861.8	1.400	1071.6	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.000	5.7	Flush-Flo™	0.296	5.7	Kick-Flo®	0.642	4.6	Mean Flow over Head Range	-	4.9	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	3.9	1.200	6.2	3.000	9.5	7.000	14.3	0.200	5.5	1.400	6.7	3.500	10.3	7.500	14.7	0.300	5.7	1.600	7.1	4.000	10.9	8.000	15.2	0.400	5.6	1.800	7.5	4.500	11.6	8.500	15.7	0.500	5.4	2.000	7.9	5.000	12.2	9.000	16.1	0.600	5.0	2.200	8.2	5.500	12.7	9.500	16.5	0.800	5.1	2.400	8.6	6.000	13.3			1.000	5.7	2.600	8.9	6.500	13.8		
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Date 05/01/2024 16:15 File Catchment 2 100yr 40CC ...			Designed by L. Reeves Checked by C. Dodd			
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	99.039	0.439	9.2	368.4	O K
	30 min Summer	99.150	0.550	9.2	481.3	O K
	60 min Summer	99.255	0.655	9.2	594.8	O K
	120 min Summer	99.357	0.757	9.2	713.2	O K
	180 min Summer	99.416	0.816	9.2	784.6	O K
	240 min Summer	99.452	0.852	9.2	830.4	O K
	360 min Summer	99.489	0.889	9.2	877.5	O K
	480 min Summer	99.500	0.900	9.2	892.6	O K
	600 min Summer	99.499	0.899	9.2	890.2	O K
	720 min Summer	99.489	0.889	9.2	877.6	O K
	960 min Summer	99.461	0.861	9.2	841.5	O K
	1440 min Summer	99.408	0.808	9.2	774.9	O K
	2160 min Summer	99.334	0.734	9.2	686.1	O K
	2880 min Summer	99.265	0.665	9.2	605.9	O K
	4320 min Summer	99.140	0.540	9.2	470.5	O K
	5760 min Summer	99.043	0.443	9.2	372.3	O K
	7200 min Summer	98.968	0.368	9.2	300.7	O K
	8640 min Summer	98.911	0.311	9.2	248.6	O K
	10080 min Summer	98.868	0.268	9.2	210.5	O K
	15 min Winter	99.085	0.485	9.2	413.7	O K
	30 min Winter	99.206	0.606	9.2	540.8	O K
	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
	15 min Summer	134.400	0.0	364.7	26	
	30 min Summer	88.200	0.0	478.7	41	
	60 min Summer	55.160	0.0	614.0	70	
	120 min Summer	33.880	0.0	754.4	130	
	180 min Summer	25.452	0.0	849.9	188	
	240 min Summer	20.685	0.0	920.6	248	
	360 min Summer	15.260	0.0	1017.8	366	
	480 min Summer	12.188	0.0	1082.6	484	
	600 min Summer	10.182	0.0	1129.1	602	
	720 min Summer	8.762	0.0	1164.2	720	
	960 min Summer	6.866	0.0	1211.9	828	
	1440 min Summer	4.848	0.0	1264.6	1072	
	2160 min Summer	3.409	0.0	1376.2	1476	
	2880 min Summer	2.663	0.0	1432.9	1880	
	4320 min Summer	1.903	0.0	1534.2	2640	
	5760 min Summer	1.517	0.0	1636.0	3360	
	7200 min Summer	1.287	0.0	1734.4	4104	
	8640 min Summer	1.134	0.0	1833.4	4760	
	10080 min Summer	1.026	0.0	1932.7	5448	
	15 min Winter	134.400	0.0	408.8	26	
	30 min Winter	88.200	0.0	535.1	40	
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Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status	
60 min Winter	99.320	0.720	9.2	669.2	O K	
120 min Winter	99.431	0.831	9.2	803.4	O K	
180 min Winter	99.495	0.895	9.2	885.9	O K	
240 min Winter	99.536	0.936	9.2	940.0	O K	
360 min Winter	99.579	0.979	9.2	998.1	O K	
480 min Winter	99.596	0.996	9.2	1020.1	O K	
600 min Winter	99.597	0.997	9.2	1022.6	O K	
720 min Winter	99.591	0.991	9.2	1013.6	O K	
960 min Winter	99.563	0.963	9.2	975.6	O K	
1440 min Winter	99.499	0.899	9.2	890.9	O K	
2160 min Winter	99.408	0.808	9.2	775.0	O K	
2880 min Winter	99.318	0.718	9.2	667.1	O K	
4320 min Winter	99.129	0.529	9.2	459.3	O K	
5760 min Winter	98.981	0.381	9.2	312.8	O K	
7200 min Winter	98.874	0.274	9.2	216.5	O K	
8640 min Winter	98.806	0.206	9.0	158.1	O K	
10080 min Winter	98.766	0.166	8.7	125.2	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)		
60 min Winter	55.160	0.0	687.8	70		
120 min Winter	33.880	0.0	844.9	128		
180 min Winter	25.452	0.0	951.5	184		
240 min Winter	20.685	0.0	1030.3	242		
360 min Winter	15.260	0.0	1138.1	358		
480 min Winter	12.188	0.0	1209.3	474		
600 min Winter	10.182	0.0	1259.6	586		
720 min Winter	8.762	0.0	1296.6	696		
960 min Winter	6.866	0.0	1342.6	910		
1440 min Winter	4.847	0.0	1352.0	1132		
2160 min Winter	3.409	0.0	1541.5	1596		
2880 min Winter	2.663	0.0	1604.9	2052		
4320 min Winter	1.903	0.0	1719.1	2816		
5760 min Winter	1.517	0.0	1832.6	3520		
7200 min Winter	1.287	0.0	1942.9	4176		
8640 min Winter	1.134	0.0	2054.0	4760		
10080 min Winter	1.026	0.0	2165.9	5352		
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<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	99.050	0.450	9.2	378.9	O K
	30 min Summer	99.164	0.564	9.2	495.4	O K
	60 min Summer	99.270	0.670	9.2	612.4	O K
	120 min Summer	99.364	0.764	9.2	721.3	O K
	180 min Summer	99.408	0.808	9.2	774.7	O K
	240 min Summer	99.431	0.831	9.2	804.2	O K
	360 min Summer	99.455	0.855	9.2	834.6	O K
	480 min Summer	99.464	0.864	9.2	845.5	O K
	600 min Summer	99.463	0.863	9.2	844.9	O K
	720 min Summer	99.457	0.857	9.2	837.0	O K
	960 min Summer	99.441	0.841	9.2	816.1	O K
	1440 min Summer	99.406	0.806	9.2	773.1	O K
	2160 min Summer	99.354	0.754	9.2	709.3	O K
	2880 min Summer	99.300	0.700	9.2	646.1	O K
	4320 min Summer	99.181	0.581	9.2	513.3	O K
	5760 min Summer	99.075	0.475	9.2	403.6	O K
	7200 min Summer	98.983	0.383	9.2	314.4	O K
	8640 min Summer	98.908	0.308	9.2	245.6	O K
	10080 min Summer	98.849	0.249	9.1	194.7	O K
	15 min Winter	99.096	0.496	9.2	425.5	O K
	30 min Winter	99.220	0.620	9.2	556.6	O K
	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
	15 min Summer	138.153	0.0	375.0	26	
	30 min Summer	90.705	0.0	492.2	41	
	60 min Summer	56.713	0.0	631.3	70	
	120 min Summer	34.246	0.0	762.6	130	
	180 min Summer	25.149	0.0	839.8	188	
	240 min Summer	20.078	0.0	893.8	248	
	360 min Summer	14.585	0.0	973.1	366	
	480 min Summer	11.622	0.0	1033.0	484	
	600 min Summer	9.738	0.0	1080.8	602	
	720 min Summer	8.424	0.0	1120.5	718	
	960 min Summer	6.697	0.0	1183.6	822	
	1440 min Summer	4.839	0.0	1262.7	1072	
	2160 min Summer	3.490	0.0	1409.0	1476	
	2880 min Summer	2.766	0.0	1488.1	1904	
	4320 min Summer	1.989	0.0	1603.7	2648	
	5760 min Summer	1.573	0.0	1697.0	3400	
	7200 min Summer	1.311	0.0	1766.6	4104	
	8640 min Summer	1.129	0.0	1824.4	4760	
	10080 min Summer	0.994	0.0	1872.3	5448	
	15 min Winter	138.153	0.0	420.3	26	
	30 min Winter	90.705	0.0	549.8	40	
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Innovyze		Source Control 2020.1			
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
60 min Winter	99.336	0.736	9.2	688.7	O K
120 min Winter	99.438	0.838	9.2	812.5	O K
180 min Winter	99.487	0.887	9.2	874.8	O K
240 min Winter	99.514	0.914	9.2	910.5	O K
360 min Winter	99.544	0.944	9.2	949.5	O K
480 min Winter	99.556	0.956	9.2	966.6	O K
600 min Winter	99.559	0.959	9.2	970.9	O K
720 min Winter	99.557	0.957	9.2	967.1	O K
960 min Winter	99.541	0.941	9.2	945.5	O K
1440 min Winter	99.498	0.898	9.2	888.8	O K
2160 min Winter	99.430	0.830	9.2	802.7	O K
2880 min Winter	99.357	0.757	9.2	712.7	O K
4320 min Winter	99.180	0.580	9.2	512.8	O K
5760 min Winter	99.018	0.418	9.2	347.9	O K
7200 min Winter	98.889	0.289	9.2	229.2	O K
8640 min Winter	98.803	0.203	9.0	155.9	O K
10080 min Winter	98.756	0.156	8.6	117.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	56.713	0.0	707.2	70	
120 min Winter	34.246	0.0	854.0	128	
180 min Winter	25.149	0.0	940.3	184	
240 min Winter	20.078	0.0	1000.4	242	
360 min Winter	14.585	0.0	1088.6	358	
480 min Winter	11.622	0.0	1154.8	472	
600 min Winter	9.738	0.0	1207.1	586	
720 min Winter	8.424	0.0	1249.9	696	
960 min Winter	6.697	0.0	1314.4	906	
1440 min Winter	4.839	0.0	1351.5	1132	
2160 min Winter	3.490	0.0	1578.2	1600	
2880 min Winter	2.766	0.0	1666.7	2052	
4320 min Winter	1.989	0.0	1796.6	2860	
5760 min Winter	1.573	0.0	1900.9	3576	
7200 min Winter	1.311	0.0	1979.0	4184	
8640 min Winter	1.129	0.0	2043.9	4760	
10080 min Winter	0.994	0.0	2098.3	5248	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	232746 Land North of Normandy Way and West of Ashby Road Catchment 2 FSR Storage																																																																																																				
Date 10/01/2024 08:45 File Catchment 2 100yr 40CC ...	Designed by L. Reeves Checked by C. Dodd																																																																																																				
InnovyzeSource Control 2020.1																																																																																																					
Model Details Storage is Online Cover Level (m) 100.000 Tank or Pond Structure Invert Level (m) 98.600 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>708.8</td><td>1.000</td><td>1380.6</td><td>1.400</td><td>1688.8</td></tr></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0140-9200-1000-9200 Design Head (m)1.000 Design Flow (l/s)9.2 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)140 Invert Level (m)98.600 Minimum Outlet Pipe Diameter (mm)225 Suggested Manhole Diameter (mm)1200 <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.000</td><td>9.2</td></tr><tr><td>Flush-Flo™</td><td>0.301</td><td>9.2</td></tr><tr><td>Kick-Flo®</td><td>0.669</td><td>7.6</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>7.9</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>5.1</td><td>1.200</td><td>10.0</td><td>3.000</td><td>15.5</td><td>7.000</td><td>23.2</td></tr><tr><td>0.200</td><td>8.9</td><td>1.400</td><td>10.8</td><td>3.500</td><td>16.6</td><td>7.500</td><td>24.0</td></tr><tr><td>0.300</td><td>9.2</td><td>1.600</td><td>11.5</td><td>4.000</td><td>17.7</td><td>8.000</td><td>24.7</td></tr><tr><td>0.400</td><td>9.1</td><td>1.800</td><td>12.1</td><td>4.500</td><td>18.8</td><td>8.500</td><td>25.5</td></tr><tr><td>0.500</td><td>8.8</td><td>2.000</td><td>12.8</td><td>5.000</td><td>19.7</td><td>9.000</td><td>26.2</td></tr><tr><td>0.600</td><td>8.4</td><td>2.200</td><td>13.3</td><td>5.500</td><td>20.7</td><td>9.500</td><td>26.9</td></tr><tr><td>0.800</td><td>8.3</td><td>2.400</td><td>13.9</td><td>6.000</td><td>21.5</td><td></td><td></td></tr><tr><td>1.000</td><td>9.2</td><td>2.600</td><td>14.4</td><td>6.500</td><td>22.4</td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	708.8	1.000	1380.6	1.400	1688.8	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.000	9.2	Flush-Flo™	0.301	9.2	Kick-Flo®	0.669	7.6	Mean Flow over Head Range	-	7.9	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	5.1	1.200	10.0	3.000	15.5	7.000	23.2	0.200	8.9	1.400	10.8	3.500	16.6	7.500	24.0	0.300	9.2	1.600	11.5	4.000	17.7	8.000	24.7	0.400	9.1	1.800	12.1	4.500	18.8	8.500	25.5	0.500	8.8	2.000	12.8	5.000	19.7	9.000	26.2	0.600	8.4	2.200	13.3	5.500	20.7	9.500	26.9	0.800	8.3	2.400	13.9	6.000	21.5			1.000	9.2	2.600	14.4	6.500	22.4		
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																																
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0.600	8.4	2.200	13.3	5.500	20.7	9.500	26.9																																																																																														
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		232746 Land North of Normandy Way and West of Ashby Road Catchment 3 FEH Storage				
Date 04/03/2024 11:28 File Catchment 3 100yr 40CC ...		Designed by L. Reeves Checked by C. Dodd				
Innovyze		Source Control 2020.1				
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		99.129	0.329	7.0	270.2	O K
30 min Summer		99.218	0.418	7.0	352.8	O K
60 min Summer		99.304	0.504	7.0	435.9	O K
120 min Summer		99.391	0.591	7.0	523.2	O K
180 min Summer		99.441	0.641	7.0	575.9	O K
240 min Summer		99.473	0.673	7.0	609.6	O K
360 min Summer		99.504	0.704	7.0	644.2	O K
480 min Summer		99.515	0.715	7.0	655.3	O K
600 min Summer		99.513	0.713	7.0	653.6	O K
720 min Summer		99.504	0.704	7.0	644.3	O K
960 min Summer		99.481	0.681	7.0	619.3	O K
1440 min Summer		99.437	0.637	7.0	571.8	O K
2160 min Summer		99.373	0.573	7.0	505.5	O K
2880 min Summer		99.310	0.510	7.0	441.9	O K
4320 min Summer		99.211	0.411	7.0	345.8	O K
5760 min Summer		99.134	0.334	7.0	275.1	O K
7200 min Summer		99.077	0.277	7.0	224.3	O K
8640 min Summer		99.035	0.235	7.0	187.5	O K
10080 min Summer		99.003	0.203	6.9	161.2	O K
15 min Winter		99.165	0.365	7.0	303.4	O K
30 min Winter		99.264	0.464	7.0	396.4	O K
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer		134.400	0.0	263.1	26	
30 min Summer		88.200	0.0	346.1	41	
60 min Summer		55.160	0.0	447.8	70	
120 min Summer		33.880	0.0	550.5	130	
180 min Summer		25.452	0.0	620.3	188	
240 min Summer		20.685	0.0	671.9	246	
360 min Summer		15.260	0.0	742.8	366	
480 min Summer		12.188	0.0	790.0	484	
600 min Summer		10.182	0.0	823.9	602	
720 min Summer		8.762	0.0	849.4	714	
960 min Summer		6.866	0.0	884.2	816	
1440 min Summer		4.848	0.0	924.2	1060	
2160 min Summer		3.409	0.0	1007.5	1472	
2880 min Summer		2.663	0.0	1049.0	1852	
4320 min Summer		1.903	0.0	1122.2	2604	
5760 min Summer		1.517	0.0	1198.9	3344	
7200 min Summer		1.287	0.0	1270.8	4040	
8640 min Summer		1.134	0.0	1343.0	4752	
10080 min Summer		1.026	0.0	1414.8	5440	
15 min Winter		134.400	0.0	295.2	26	
30 min Winter		88.200	0.0	387.1	40	
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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	99.359	0.559	7.0	490.6	O K
120 min Winter	99.454	0.654	7.0	589.2	O K
180 min Winter	99.509	0.709	7.0	649.7	O K
240 min Winter	99.545	0.745	7.0	689.3	O K
360 min Winter	99.583	0.783	7.0	731.6	O K
480 min Winter	99.597	0.797	7.0	747.5	O K
600 min Winter	99.598	0.798	7.0	749.1	O K
720 min Winter	99.592	0.792	7.0	742.2	O K
960 min Winter	99.567	0.767	7.0	714.1	O K
1440 min Winter	99.513	0.713	7.0	653.6	O K
2160 min Winter	99.433	0.633	7.0	567.5	O K
2880 min Winter	99.351	0.551	7.0	482.7	O K
4320 min Winter	99.196	0.396	7.0	332.2	O K
5760 min Winter	99.082	0.282	7.0	228.2	O K
7200 min Winter	99.005	0.205	7.0	162.2	O K
8640 min Winter	98.958	0.158	6.8	123.6	O K
10080 min Winter	98.937	0.137	6.5	106.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	55.160	0.0	501.9	70	
120 min Winter	33.880	0.0	616.6	126	
180 min Winter	25.452	0.0	694.5	184	
240 min Winter	20.685	0.0	752.0	242	
360 min Winter	15.260	0.0	830.7	358	
480 min Winter	12.188	0.0	882.7	472	
600 min Winter	10.182	0.0	919.6	586	
720 min Winter	8.762	0.0	946.9	694	
960 min Winter	6.866	0.0	982.3	904	
1440 min Winter	4.847	0.0	1008.8	1124	
2160 min Winter	3.409	0.0	1128.6	1584	
2880 min Winter	2.663	0.0	1174.9	2048	
4320 min Winter	1.903	0.0	1257.8	2780	
5760 min Winter	1.517	0.0	1343.0	3472	
7200 min Winter	1.287	0.0	1423.7	4112	
8640 min Winter	1.134	0.0	1504.8	4680	
10080 min Winter	1.026	0.0	1586.0	5256	
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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)	Depth (m)	Area (m ²)
0.000	745.6	0.800	1147.2	1.200	1372.6

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0127-7000-0800-7000
Design Head (m)	0.800
Design Flow (l/s)	7.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	127
Invert Level (m)	98.800
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	7.0
Flush-Flo™	0.248	7.0
Kick-Flo®	0.553	5.9
Mean Flow over Head Range	-	6.0

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	4.5	1.200	8.5	3.000	13.0	7.000	19.6
0.200	6.9	1.400	9.1	3.500	14.0	7.500	20.2
0.300	7.0	1.600	9.7	4.000	15.0	8.000	20.9
0.400	6.8	1.800	10.2	4.500	15.8	8.500	21.4
0.500	6.4	2.000	10.8	5.000	16.7	9.000	22.1
0.600	6.1	2.200	11.3	5.500	17.4	9.500	22.7
0.800	7.0	2.400	11.7	6.000	18.2		
1.000	7.8	2.600	12.2	6.500	18.9		

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Date 04/03/2024 13:24 File Catchment 3 100yr 40CC ...		Designed by L. Reeves Checked by C. Dodd				
Innovyze		Source Control 2020.1				
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		99.137	0.337	7.0	277.9	O K
30 min Summer		99.229	0.429	7.0	363.1	O K
60 min Summer		99.317	0.517	7.0	448.7	O K
120 min Summer		99.396	0.596	7.0	529.1	O K
180 min Summer		99.434	0.634	7.0	568.6	O K
240 min Summer		99.455	0.655	7.0	590.5	O K
360 min Summer		99.476	0.676	7.0	612.9	O K
480 min Summer		99.483	0.683	7.0	621.0	O K
600 min Summer		99.483	0.683	7.0	620.5	O K
720 min Summer		99.477	0.677	7.0	614.8	O K
960 min Summer		99.464	0.664	7.0	600.8	O K
1440 min Summer		99.436	0.636	7.0	570.5	O K
2160 min Summer		99.390	0.590	7.0	522.9	O K
2880 min Summer		99.340	0.540	7.0	471.8	O K
4320 min Summer		99.242	0.442	7.0	375.7	O K
5760 min Summer		99.158	0.358	7.0	296.8	O K
7200 min Summer		99.087	0.287	7.0	233.4	O K
8640 min Summer		99.032	0.232	7.0	185.4	O K
10080 min Summer		98.991	0.191	6.9	150.7	O K
15 min Winter		99.175	0.375	7.0	312.0	O K
30 min Winter		99.276	0.476	7.0	408.0	O K
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer		138.153	0.0	270.6	26	
30 min Summer		90.705	0.0	355.9	41	
60 min Summer		56.713	0.0	460.5	70	
120 min Summer		34.246	0.0	556.5	130	
180 min Summer		25.149	0.0	612.9	188	
240 min Summer		20.078	0.0	652.3	246	
360 min Summer		14.585	0.0	710.2	364	
480 min Summer		11.622	0.0	753.8	482	
600 min Summer		9.738	0.0	788.6	602	
720 min Summer		8.424	0.0	817.5	704	
960 min Summer		6.697	0.0	863.3	808	
1440 min Summer		4.839	0.0	922.8	1058	
2160 min Summer		3.490	0.0	1031.6	1472	
2880 min Summer		2.766	0.0	1089.4	1876	
4320 min Summer		1.989	0.0	1173.2	2640	
5760 min Summer		1.573	0.0	1243.6	3352	
7200 min Summer		1.311	0.0	1294.4	4040	
8640 min Summer		1.129	0.0	1336.4	4752	
10080 min Summer		0.994	0.0	1370.5	5360	
15 min Winter		138.153	0.0	303.5	26	
30 min Winter		90.705	0.0	397.9	40	
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Date 04/03/2024 13:24 File Catchment 3 100yr 40CC ...		Designed by L. Reeves Checked by C. Dodd			
Innovyze		Source Control 2020.1			
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
60 min Winter	99.373	0.573	7.0	504.9	O K
120 min Winter	99.460	0.660	7.0	595.9	O K
180 min Winter	99.502	0.702	7.0	641.6	O K
240 min Winter	99.526	0.726	7.0	667.7	O K
360 min Winter	99.551	0.751	7.0	696.1	O K
480 min Winter	99.562	0.762	7.0	708.5	O K
600 min Winter	99.565	0.765	7.0	711.4	O K
720 min Winter	99.562	0.762	7.0	708.5	O K
960 min Winter	99.548	0.748	7.0	692.2	O K
1440 min Winter	99.512	0.712	7.0	652.1	O K
2160 min Winter	99.452	0.652	7.0	587.8	O K
2880 min Winter	99.386	0.586	7.0	518.6	O K
4320 min Winter	99.235	0.435	7.0	368.5	O K
5760 min Winter	99.109	0.309	7.0	252.1	O K
7200 min Winter	99.014	0.214	7.0	170.5	O K
8640 min Winter	98.957	0.157	6.8	122.3	O K
10080 min Winter	98.933	0.133	6.3	103.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	56.713	0.0	516.0	70	
120 min Winter	34.246	0.0	623.3	126	
180 min Winter	25.149	0.0	686.3	184	
240 min Winter	20.078	0.0	730.2	242	
360 min Winter	14.585	0.0	794.5	358	
480 min Winter	11.622	0.0	842.8	472	
600 min Winter	9.738	0.0	881.0	584	
720 min Winter	8.424	0.0	912.3	694	
960 min Winter	6.697	0.0	960.5	902	
1440 min Winter	4.839	0.0	1007.8	1124	
2160 min Winter	3.490	0.0	1155.5	1588	
2880 min Winter	2.766	0.0	1220.1	2048	
4320 min Winter	1.989	0.0	1314.7	2816	
5760 min Winter	1.573	0.0	1393.2	3520	
7200 min Winter	1.311	0.0	1450.2	4120	
8640 min Winter	1.129	0.0	1497.4	4680	
10080 min Winter	0.994	0.0	1536.4	5256	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	232746 Land North of Normandy Way and West of Ashby Road Catchment 3 FSR Storage	
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	232746 Land North of Normandy Way and West of Ashby Road Catchment 3 FSR Storage																																																																																																				
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Model Details Storage is Online Cover Level (m) 100.000 Tank or Pond Structure Invert Level (m) 98.800 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>745.6</td><td>0.800</td><td>1147.2</td><td>1.200</td><td>1372.6</td></tr></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0127-7000-0800-7000 Design Head (m)0.800 Design Flow (l/s)7.0 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)127 Invert Level (m)98.800 Minimum Outlet Pipe Diameter (mm)150 Suggested Manhole Diameter (mm)1200 <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>0.800</td><td>7.0</td></tr><tr><td>Flush-Flo™</td><td>0.248</td><td>7.0</td></tr><tr><td>Kick-Flo®</td><td>0.553</td><td>5.9</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>6.0</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>4.5</td><td>1.200</td><td>8.5</td><td>3.000</td><td>13.0</td><td>7.000</td><td>19.6</td></tr><tr><td>0.200</td><td>6.9</td><td>1.400</td><td>9.1</td><td>3.500</td><td>14.0</td><td>7.500</td><td>20.2</td></tr><tr><td>0.300</td><td>7.0</td><td>1.600</td><td>9.7</td><td>4.000</td><td>15.0</td><td>8.000</td><td>20.9</td></tr><tr><td>0.400</td><td>6.8</td><td>1.800</td><td>10.2</td><td>4.500</td><td>15.8</td><td>8.500</td><td>21.4</td></tr><tr><td>0.500</td><td>6.4</td><td>2.000</td><td>10.8</td><td>5.000</td><td>16.7</td><td>9.000</td><td>22.1</td></tr><tr><td>0.600</td><td>6.1</td><td>2.200</td><td>11.3</td><td>5.500</td><td>17.4</td><td>9.500</td><td>22.7</td></tr><tr><td>0.800</td><td>7.0</td><td>2.400</td><td>11.7</td><td>6.000</td><td>18.2</td><td></td><td></td></tr><tr><td>1.000</td><td>7.8</td><td>2.600</td><td>12.2</td><td>6.500</td><td>18.9</td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	745.6	0.800	1147.2	1.200	1372.6	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	0.800	7.0	Flush-Flo™	0.248	7.0	Kick-Flo®	0.553	5.9	Mean Flow over Head Range	-	6.0	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	4.5	1.200	8.5	3.000	13.0	7.000	19.6	0.200	6.9	1.400	9.1	3.500	14.0	7.500	20.2	0.300	7.0	1.600	9.7	4.000	15.0	8.000	20.9	0.400	6.8	1.800	10.2	4.500	15.8	8.500	21.4	0.500	6.4	2.000	10.8	5.000	16.7	9.000	22.1	0.600	6.1	2.200	11.3	5.500	17.4	9.500	22.7	0.800	7.0	2.400	11.7	6.000	18.2			1.000	7.8	2.600	12.2	6.500	18.9		
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																																																																
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0.200	6.9	1.400	9.1	3.500	14.0	7.500	20.2																																																																																														
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ			232746 Land North of Normandy Way and West of Ashby Road Catchment 4 FEH Storage			
Date 04/03/2024 11:35 File Catchment 4 100yr 40CC ...			Designed by L. Reeves Checked by C. Dodd			
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	98.983	0.383	28.2	1133.6	O K
	30 min Summer	99.092	0.492	28.2	1479.9	O K
	60 min Summer	99.200	0.600	28.2	1830.0	O K
	120 min Summer	99.310	0.710	28.2	2200.5	O K
	180 min Summer	99.378	0.778	28.2	2433.1	O K
	240 min Summer	99.422	0.822	28.2	2584.8	O K
	360 min Summer	99.468	0.868	28.2	2747.5	O K
	480 min Summer	99.486	0.886	28.2	2810.1	O K
	600 min Summer	99.488	0.888	28.2	2817.8	O K
	720 min Summer	99.481	0.881	28.2	2793.0	O K
	960 min Summer	99.456	0.856	28.2	2705.0	O K
	1440 min Summer	99.407	0.807	28.2	2532.8	O K
	2160 min Summer	99.331	0.731	28.2	2271.5	O K
	2880 min Summer	99.259	0.659	28.2	2027.9	O K
	4320 min Summer	99.145	0.545	28.2	1650.8	O K
	5760 min Summer	99.057	0.457	28.2	1368.0	O K
	7200 min Summer	98.992	0.392	28.2	1161.8	O K
	8640 min Summer	98.943	0.343	28.1	1011.8	O K
	10080 min Summer	98.907	0.307	28.0	900.3	O K
	15 min Winter	99.027	0.427	28.2	1272.0	O K
	30 min Winter	99.149	0.549	28.2	1661.9	O K
	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
	15 min Summer	134.400	0.0	1033.2	26	
	30 min Summer	88.200	0.0	1368.7	41	
	60 min Summer	55.160	0.0	1833.0	70	
	120 min Summer	33.880	0.0	2256.8	130	
	180 min Summer	25.452	0.0	2542.9	188	
	240 min Summer	20.685	0.0	2753.7	248	
	360 min Summer	15.260	0.0	3041.0	366	
	480 min Summer	12.188	0.0	3230.1	484	
	600 min Summer	10.182	0.0	3363.5	602	
	720 min Summer	8.762	0.0	3462.1	720	
	960 min Summer	6.866	0.0	3590.4	828	
	1440 min Summer	4.848	0.0	3713.1	1072	
	2160 min Summer	3.409	0.0	4183.2	1472	
	2880 min Summer	2.663	0.0	4352.9	1852	
	4320 min Summer	1.903	0.0	4645.6	2636	
	5760 min Summer	1.517	0.0	4999.6	3352	
	7200 min Summer	1.287	0.0	5296.7	4048	
	8640 min Summer	1.134	0.0	5592.3	4760	
	10080 min Summer	1.026	0.0	5879.8	5448	
	15 min Winter	134.400	0.0	1163.5	26	
	30 min Winter	88.200	0.0	1533.6	40	
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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	99.268	0.668	28.2	2057.0	O K	
120 min Winter	99.392	0.792	28.2	2479.6	O K	
180 min Winter	99.467	0.867	28.2	2741.5	O K	
240 min Winter	99.516	0.916	28.2	2915.3	O K	
360 min Winter	99.569	0.969	28.2	3107.7	O K	
480 min Winter	99.592	0.992	28.2	3188.8	O K	
600 min Winter	99.597	0.997	28.2	3208.9	O K	
720 min Winter	99.593	0.993	28.2	3193.2	O K	
960 min Winter	99.567	0.967	28.2	3098.2	O K	
1440 min Winter	99.504	0.904	28.2	2872.8	O K	
2160 min Winter	99.411	0.811	28.2	2544.9	O K	
2880 min Winter	99.311	0.711	28.2	2203.4	O K	
4320 min Winter	99.137	0.537	28.2	1623.8	O K	
5760 min Winter	99.005	0.405	28.2	1204.0	O K	
7200 min Winter	98.915	0.315	28.0	924.1	O K	
8640 min Winter	98.857	0.257	27.5	747.4	O K	
10080 min Winter	98.827	0.227	26.6	658.5	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)		
60 min Winter	55.160	0.0	2056.5	70		
120 min Winter	33.880	0.0	2528.6	128		
180 min Winter	25.452	0.0	2847.0	184		
240 min Winter	20.685	0.0	3080.8	242		
360 min Winter	15.260	0.0	3397.3	358		
480 min Winter	12.188	0.0	3603.0	474		
600 min Winter	10.182	0.0	3745.2	586		
720 min Winter	8.762	0.0	3847.3	696		
960 min Winter	6.866	0.0	3969.4	908		
1440 min Winter	4.847	0.0	4020.9	1132		
2160 min Winter	3.409	0.0	4686.4	1596		
2880 min Winter	2.663	0.0	4876.4	2028		
4320 min Winter	1.903	0.0	5209.9	2812		
5760 min Winter	1.517	0.0	5602.5	3520		
7200 min Winter	1.287	0.0	5936.3	4184		
8640 min Winter	1.134	0.0	6269.3	4760		
10080 min Winter	1.026	0.0	6596.6	5352		
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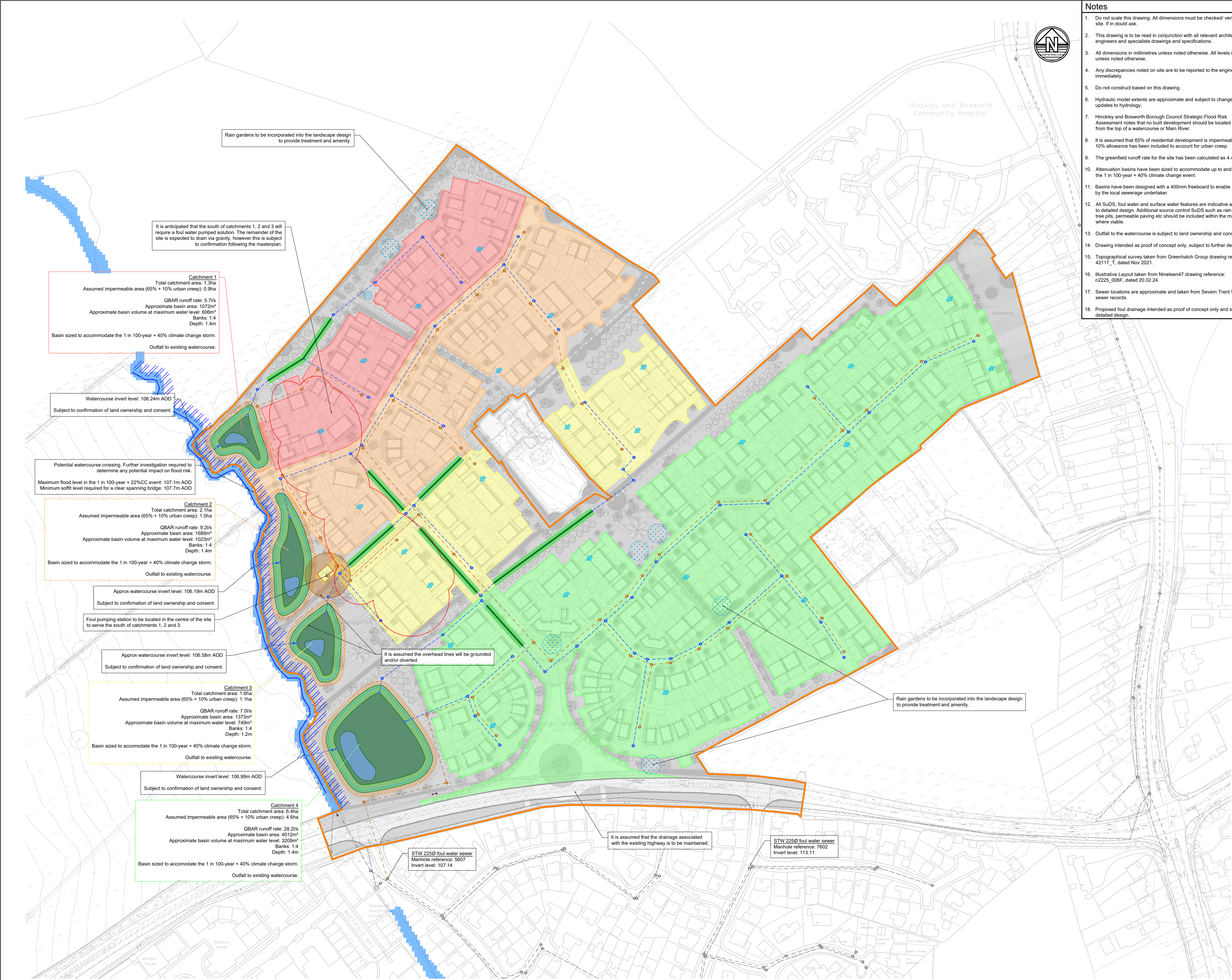
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Innovyze			Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>						
	Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
	15 min Summer	98.993	0.393	28.2	1165.7	O K
	30 min Summer	99.106	0.506	28.2	1522.9	O K
	60 min Summer	99.216	0.616	28.2	1883.2	O K
	120 min Summer	99.318	0.718	28.2	2225.8	O K
	180 min Summer	99.369	0.769	28.2	2402.1	O K
	240 min Summer	99.399	0.799	28.2	2503.5	O K
	360 min Summer	99.431	0.831	28.2	2615.3	O K
	480 min Summer	99.445	0.845	28.2	2665.5	O K
	600 min Summer	99.449	0.849	28.2	2678.7	O K
	720 min Summer	99.446	0.846	28.2	2668.5	O K
	960 min Summer	99.434	0.834	28.2	2626.8	O K
	1440 min Summer	99.406	0.806	28.2	2527.2	O K
	2160 min Summer	99.355	0.755	28.2	2351.4	O K
	2880 min Summer	99.295	0.695	28.2	2148.6	O K
	4320 min Summer	99.184	0.584	28.2	1777.0	O K
	5760 min Summer	99.086	0.486	28.2	1460.3	O K
	7200 min Summer	99.005	0.405	28.2	1202.5	O K
	8640 min Summer	98.941	0.341	28.1	1002.7	O K
	10080 min Summer	98.891	0.291	27.9	851.8	O K
	15 min Winter	99.038	0.438	28.2	1308.0	O K
	30 min Winter	99.163	0.563	28.2	1710.0	O K
	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
	15 min Summer	138.153	0.0	1063.7	26	
	30 min Summer	90.705	0.0	1408.1	41	
	60 min Summer	56.713	0.0	1885.6	70	
	120 min Summer	34.246	0.0	2281.3	130	
	180 min Summer	25.149	0.0	2512.7	188	
	240 min Summer	20.078	0.0	2673.4	248	
	360 min Summer	14.585	0.0	2908.3	366	
	480 min Summer	11.622	0.0	3083.7	484	
	600 min Summer	9.738	0.0	3221.9	602	
	720 min Summer	8.424	0.0	3334.9	720	
	960 min Summer	6.697	0.0	3508.9	824	
	1440 min Summer	4.839	0.0	3708.0	1072	
	2160 min Summer	3.490	0.0	4282.9	1476	
	2880 min Summer	2.766	0.0	4520.7	1876	
	4320 min Summer	1.989	0.0	4856.8	2644	
	5760 min Summer	1.573	0.0	5186.7	3400	
	7200 min Summer	1.311	0.0	5395.6	4104	
	8640 min Summer	1.129	0.0	5564.8	4760	
	10080 min Summer	0.994	0.0	5695.1	5448	
	15 min Winter	138.153	0.0	1197.3	26	
	30 min Winter	90.705	0.0	1576.6	40	
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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 (m³)	Status	
60 min Winter	99.286	0.686	28.2	2117.0	O K	
120 min Winter	99.400	0.800	28.2	2507.6	O K	
180 min Winter	99.457	0.857	28.2	2707.2	O K	
240 min Winter	99.490	0.890	28.2	2824.7	O K	
360 min Winter	99.528	0.928	28.2	2959.0	O K	
480 min Winter	99.546	0.946	28.2	3025.3	O K	
600 min Winter	99.554	0.954	28.2	3051.2	O K	
720 min Winter	99.554	0.954	28.2	3051.6	O K	
960 min Winter	99.541	0.941	28.2	3006.6	O K	
1440 min Winter	99.502	0.902	28.2	2866.4	O K	
2160 min Winter	99.435	0.835	28.2	2631.4	O K	
2880 min Winter	99.358	0.758	28.2	2361.1	O K	
4320 min Winter	99.184	0.584	28.2	1776.4	O K	
5760 min Winter	99.038	0.438	28.2	1306.9	O K	
7200 min Winter	98.927	0.327	28.1	962.6	O K	
8640 min Winter	98.855	0.255	27.5	740.6	O K	
10080 min Winter	98.821	0.221	25.8	639.3	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)		
60 min Winter	56.713	0.0	2115.1	70		
120 min Winter	34.246	0.0	2555.9	128		
180 min Winter	25.149	0.0	2813.4	184		
240 min Winter	20.078	0.0	2991.7	242		
360 min Winter	14.585	0.0	3251.2	358		
480 min Winter	11.622	0.0	3443.3	472		
600 min Winter	9.738	0.0	3592.5	586		
720 min Winter	8.424	0.0	3712.3	696		
960 min Winter	6.697	0.0	3887.4	906		
1440 min Winter	4.839	0.0	4017.3	1132		
2160 min Winter	3.490	0.0	4798.2	1600		
2880 min Winter	2.766	0.0	5063.1	2052		
4320 min Winter	1.989	0.0	5444.3	2852		
5760 min Winter	1.573	0.0	5812.0	3568		
7200 min Winter	1.311	0.0	6047.1	4184		
8640 min Winter	1.129	0.0	6238.5	4760		
10080 min Winter	0.994	0.0	6389.5	5352		
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Date 04/03/2024 13:26 File Catchment 4 100yr 40CC ...	Designed by L. Reeves Checked by C. Dodd																																																																																																				
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Model Details Storage is Online Cover Level (m) 100.000 Tank or Pond Structure Invert Level (m) 98.600 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>2809.2</td><td>1.000</td><td>3648.3</td><td>1.400</td><td>4012.0</td></tr></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0231-2820-1000-2820 Design Head (m)1.000 Design Flow (l/s)28.2 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)231 Invert Level (m)98.600 Minimum Outlet Pipe Diameter (mm)300 Suggested Manhole Diameter (mm)1500 <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.000</td><td>28.2</td></tr><tr><td>Flush-Flo™</td><td>0.374</td><td>28.2</td></tr><tr><td>Kick-Flo®</td><td>0.743</td><td>24.5</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>23.4</td></tr></table> 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 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>7.7</td><td>1.200</td><td>30.8</td><td>3.000</td><td>47.8</td><td>7.000</td><td>72.1</td></tr><tr><td>0.200</td><td>23.1</td><td>1.400</td><td>33.1</td><td>3.500</td><td>51.5</td><td>7.500</td><td>74.6</td></tr><tr><td>0.300</td><td>27.9</td><td>1.600</td><td>35.3</td><td>4.000</td><td>55.0</td><td>8.000</td><td>77.0</td></tr><tr><td>0.400</td><td>28.2</td><td>1.800</td><td>37.4</td><td>4.500</td><td>58.2</td><td>8.500</td><td>79.3</td></tr><tr><td>0.500</td><td>27.8</td><td>2.000</td><td>39.3</td><td>5.000</td><td>61.3</td><td>9.000</td><td>81.5</td></tr><tr><td>0.600</td><td>27.1</td><td>2.200</td><td>41.2</td><td>5.500</td><td>64.2</td><td>9.500</td><td>83.7</td></tr><tr><td>0.800</td><td>25.3</td><td>2.400</td><td>42.9</td><td>6.000</td><td>66.9</td><td></td><td></td></tr><tr><td>1.000</td><td>28.2</td><td>2.600</td><td>44.6</td><td>6.500</td><td>69.6</td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	2809.2	1.000	3648.3	1.400	4012.0	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.000	28.2	Flush-Flo™	0.374	28.2	Kick-Flo®	0.743	24.5	Mean Flow over Head Range	-	23.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	7.7	1.200	30.8	3.000	47.8	7.000	72.1	0.200	23.1	1.400	33.1	3.500	51.5	7.500	74.6	0.300	27.9	1.600	35.3	4.000	55.0	8.000	77.0	0.400	28.2	1.800	37.4	4.500	58.2	8.500	79.3	0.500	27.8	2.000	39.3	5.000	61.3	9.000	81.5	0.600	27.1	2.200	41.2	5.500	64.2	9.500	83.7	0.800	25.3	2.400	42.9	6.000	66.9			1.000	28.2	2.600	44.6	6.500	69.6		
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Appendix 6: Illustrative Drainage Strategy



Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.

2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.

4. Any discrepancies noted on site are to be reported to the engineer immediately.

5. Do not construct based on this drawing.

6. Hydraulic model extents are approximate and subject to change following updates to hydrology.

7. Hinckley and Bosworth Borough Council Strategic Flood Risk Assessment notes that no built development should be located within 8m from the top of a watercourse or Main River.

8. It is assumed that 65% of residential development is impermeable and a 10% allowance has been included to account for urban creep.

9. The greenfield runoff rate for the site has been calculated as 4.4/s/ha.

10. Attenuation basins have been sized to accommodate up to and including the 1 in 100-year + 40% climate change event.

11. Basins have been designed with a 400mm freeboard to enable adoption by the local sewerage undertaker.

12. All SuDS, foul water and surface water features are indicative and subject to detailed design. Additional source control SuDS such as rain gardens, tree pits, permeable paving etc should be included within the masterplan where viable.

13. Outfall to the watercourse is subject to land ownership and consent.

14. Drawing intended as proof of concept only, subject to further design.

15. Topographical survey taken from Greenhatch Group drawing reference: 42117_T, dated Nov 2021.

16. Illustrative Layout taken from Nineteen47 drawing reference: n2225_006F, dated 20.02.24.

17. Sewer locations are approximate and taken from Severn Trent Water sewer records.

18. Proposed foul drainage intended as proof of concept only and subject to detailed design.

Legend

Illustrative Site Location

1 in 100-Year + 22%CC Modelled Flood Extent

Watercourse

8m Watercourse Easement (From Top of Banks)

Existing Surface Water Sewer

Existing Foul Water Sewer

Existing Foul Water Pumping Station

Existing Foul Water Rising Main

Illustrative Detention Basin

3m SuDS Easement

Illustrative Swale

Illustrative Rain Garden

Proposed Surface Water Sewer

Proposed Headwall

Proposed Flow Control

Proposed Foul Pumping Station

Proposed Rising Main

Proposed Foul Water Sewer

Flow Direction

P06	05.03.24	Updated following revised masterplan (n2225_006F - Illustrative Layout)	LR	CMD
P05	10.01.24	Updated following revised masterplan (n2225_006C - Illustrative Layout)	LR	CMD
P04	07.11.23	Illustrative surface water pipes added	LR	CMD
P03	06.11.23	Updated following revised masterplan (n2225_005C - Concept Plan)	LR	CMD
P02	03.08.23	Updated following revised masterplan (n2225_005 - Further Concept Sketch)	LR	CMD
P01	21.07.23	Preliminary Issue	LR	CMD
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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Client

Richborough

Project Title

Land North of A47
Normandy Way and West
of A447 Ashby Road,
Hinckley

Drawing Title

Illustrative Drainage
Strategy

Drawn:	L. Reeves	Reviewed:	C. Dodd
BWB Ref:	232746	Date:	21.07.23
Drawing Status	Scale@A1:	1:1250	
PRELIMINARY			
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev	
HN2-BWB-ZZ-XX-DR-CD-001	S2	P06	

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