

**12692 Bretch Hill, Banbury**

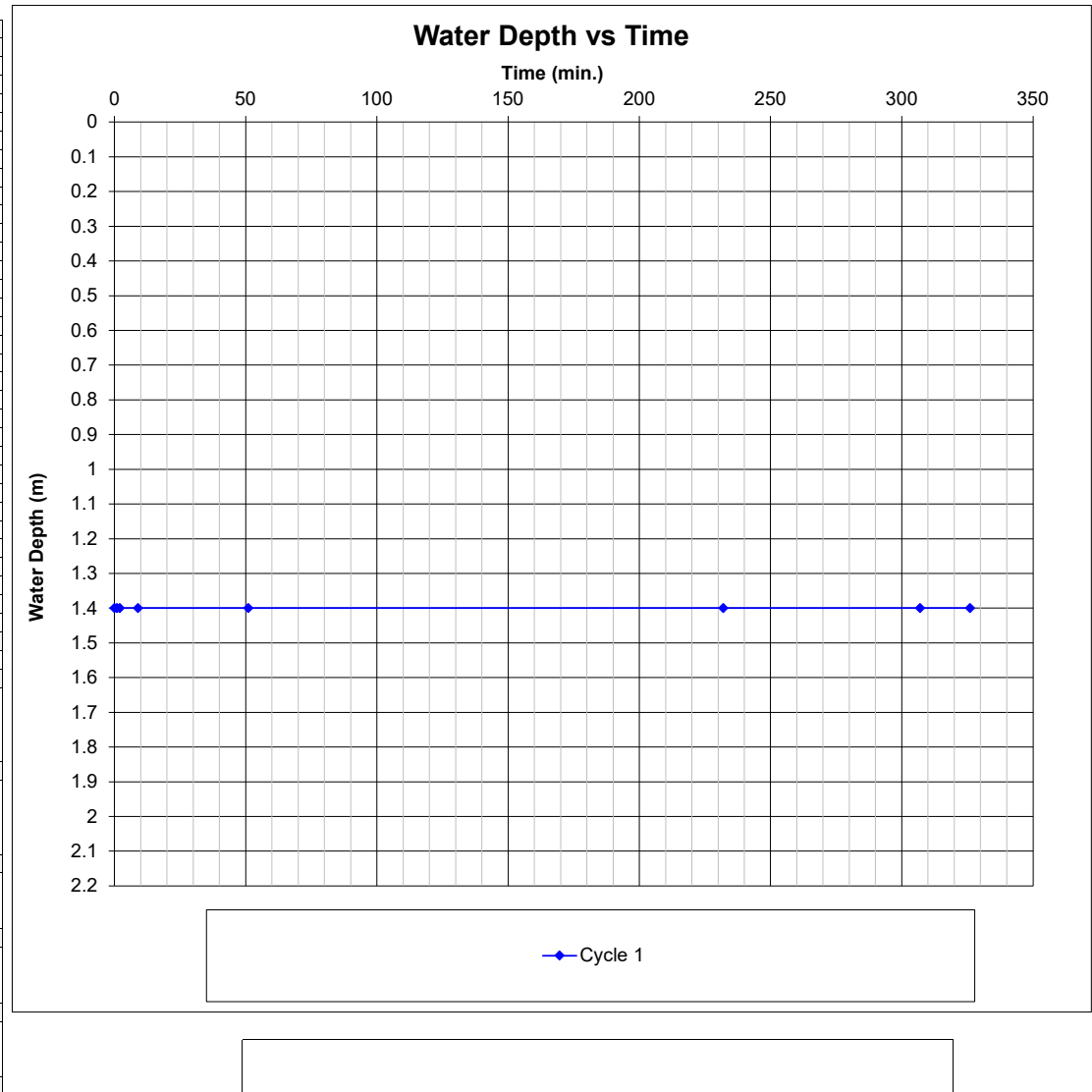
Remarks

[illegible]

**12692 Bretch Hill, Banbury**

Remarks

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.20		
<b>Water Depths (m)</b>			
Water depth at start of test	1.40		
Water depth at end of test	1.40		
Effective depth (measured)	0.00		
% Effective storage depth	0.00		
<b>Effective Storage Depths (m)</b>			
Effective storage depth (100%)	0.80		
Effective storage depth (75%)	0.60		
Effective storage depth (50%)	0.40		
Effective storage depth (25%)	0.20		
<b>Outflow Time (min)</b>			
Time for measured outflow	326		
Time for 100% outflow			
Time for 75-25% outflow			
<b>Volume of Outflow (m<sup>3</sup>)</b>			
Over measured effective depth	0.00		
Over 100% effective depth	0.96		
From 75% - 25% effective depth	0.48		
<b>Surface Area (m<sup>2</sup>)</b>			
For 100% effective storage	5.36		
For 50% effective storage	3.28		
Over measured depth	1.20		
<b>Soil Infiltration Rate (m/s)</b>	<b>Cycle 1</b>	<b>Cycle 2</b>	<b>Cycle 3</b>
Over 100% effective depth	#DIV/0!		
Over measured depth			
Over 75% - 25% effective depth	#DIV/0!		



**12692 Bretch Hill, Banbury**

Remarks
<p>1. Line of best fit extrapolated to estimate time of 100% outflow</p>

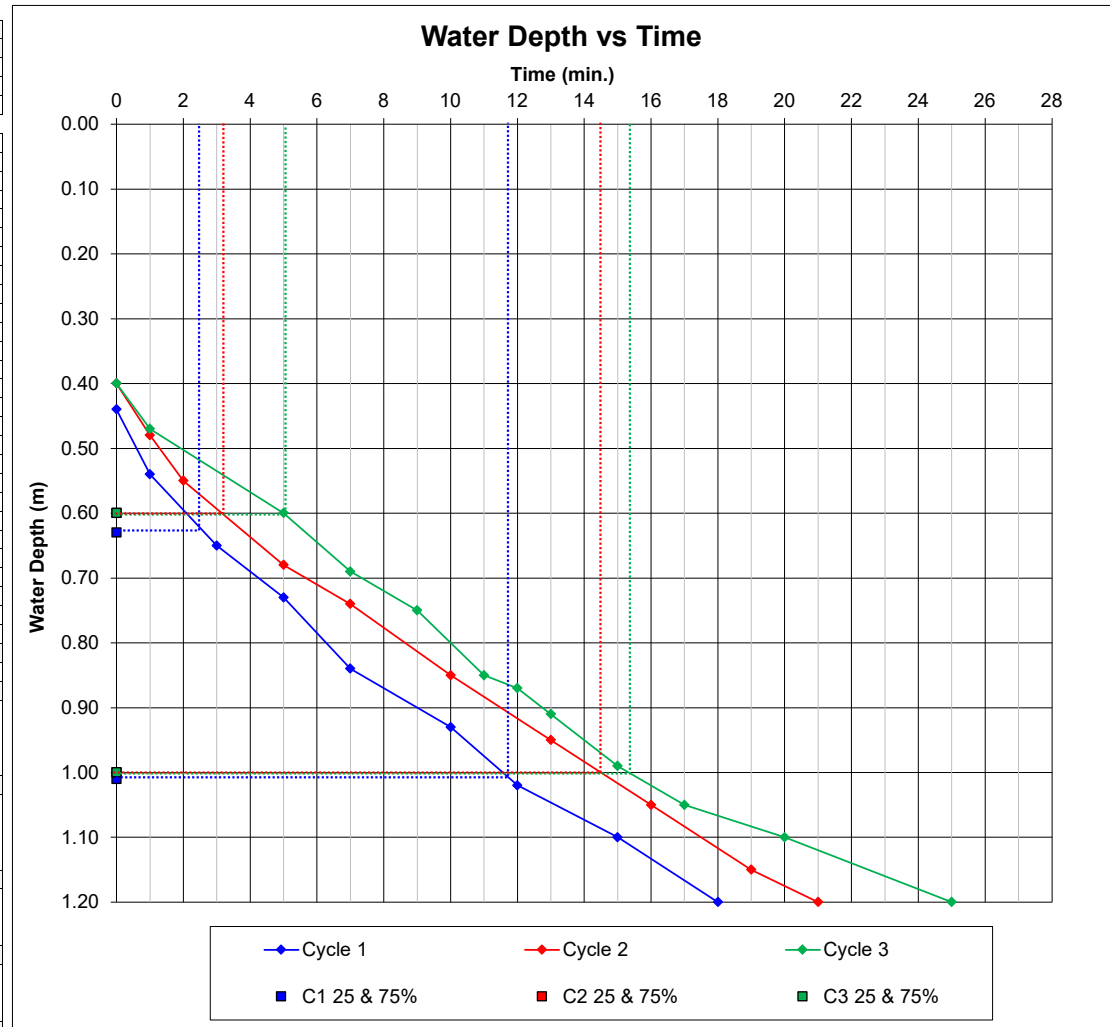
Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	3.20		
<b>Water Depths (m)</b>			
Water depth at start of test	2.05		
Water depth at end of test	2.54		
Effective depth (measured)	0.49		
% Effective storage depth	0.43		
<b>Effective Storage Depths (m)</b>			
Effective storage depth (100%)	1.15		
Effective storage depth (75%)	0.86		
Effective storage depth (50%)	0.58		
Effective storage depth (25%)	0.29		
<b>Outflow Time (min)</b>			
Time for measured outflow	342		
Time for 100% outflow	980		
Time for 75-25% outflow	530.0		
<b>Volume of Outflow (m<sup>3</sup>)</b>			
Over measured effective depth	0.65		
Over 100% effective depth	1.52		
From 75% - 25% effective depth	0.76		
<b>Surface Area (m<sup>2</sup>)</b>			
For 100% effective storage	7.76		
For 50% effective storage	4.54		
Over measured depth	4.06		
<b>Soil Infiltration Rate (m/s)</b>	<b>Cycle 1</b>	<b>Cycle 2</b>	<b>Cycle 3</b>
Over 100% effective depth	3.3E-06		
Over measured depth	7.8E-06		
Over 75% - 25% effective depth	<b>5.3E-06</b>		



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Remarks

<b>Final Excavation Depth (m)</b>	<b>Cycle 1</b>	<b>Cycle 2</b>	<b>Cycle 3</b>
At end of testing cycle	1.20	1.20	1.20
<b>Water Depths (m)</b>			
Water depth at start of test	0.44	0.40	0.40
Water depth at end of test	1.20	1.20	1.20
Effective depth (measured)	0.76	0.80	0.80
% Effective storage depth	1.00	1.00	1.00
<b>Effective Storage Depths (m)</b>			
Effective storage depth (100%)	0.76	0.80	0.80
Effective storage depth (75%)	0.57	0.60	0.60
Effective storage depth (50%)	0.38	0.40	0.40
Effective storage depth (25%)	0.19	0.20	0.20
<b>Outflow Time (min)</b>			
Time for measured outflow	18	21	25
Time for 100% outflow	18	21	25
Time for 75-25% outflow	9.3	11.3	10.2
<b>Volume of Outflow (m<sup>3</sup>)</b>			
Over measured effective depth	1.05	1.10	1.10
Over 100% effective depth	1.05	1.10	1.10
From 75% - 25% effective depth	0.52	0.55	0.55
<b>Surface Area (m<sup>2</sup>)</b>			
For 100% effective storage	5.79	6.02	6.02
For 50% effective storage	3.58	3.70	3.70
Over measured depth	5.79	6.02	6.02
<b>Soil Infiltration Rate (m/s)</b>	<b>Cycle 1</b>	<b>Cycle 2</b>	<b>Cycle 3</b>
Over 100% effective depth	1.7E-04	1.5E-04	1.2E-04
Over measured depth	1.7E-04	1.5E-04	1.2E-04
Over 75% - 25% effective depth	<b>2.6E-04</b>	<b>2.2E-04</b>	<b>2.4E-04</b>



Design Soil Infiltration Rate: 2.2E-04 m/s

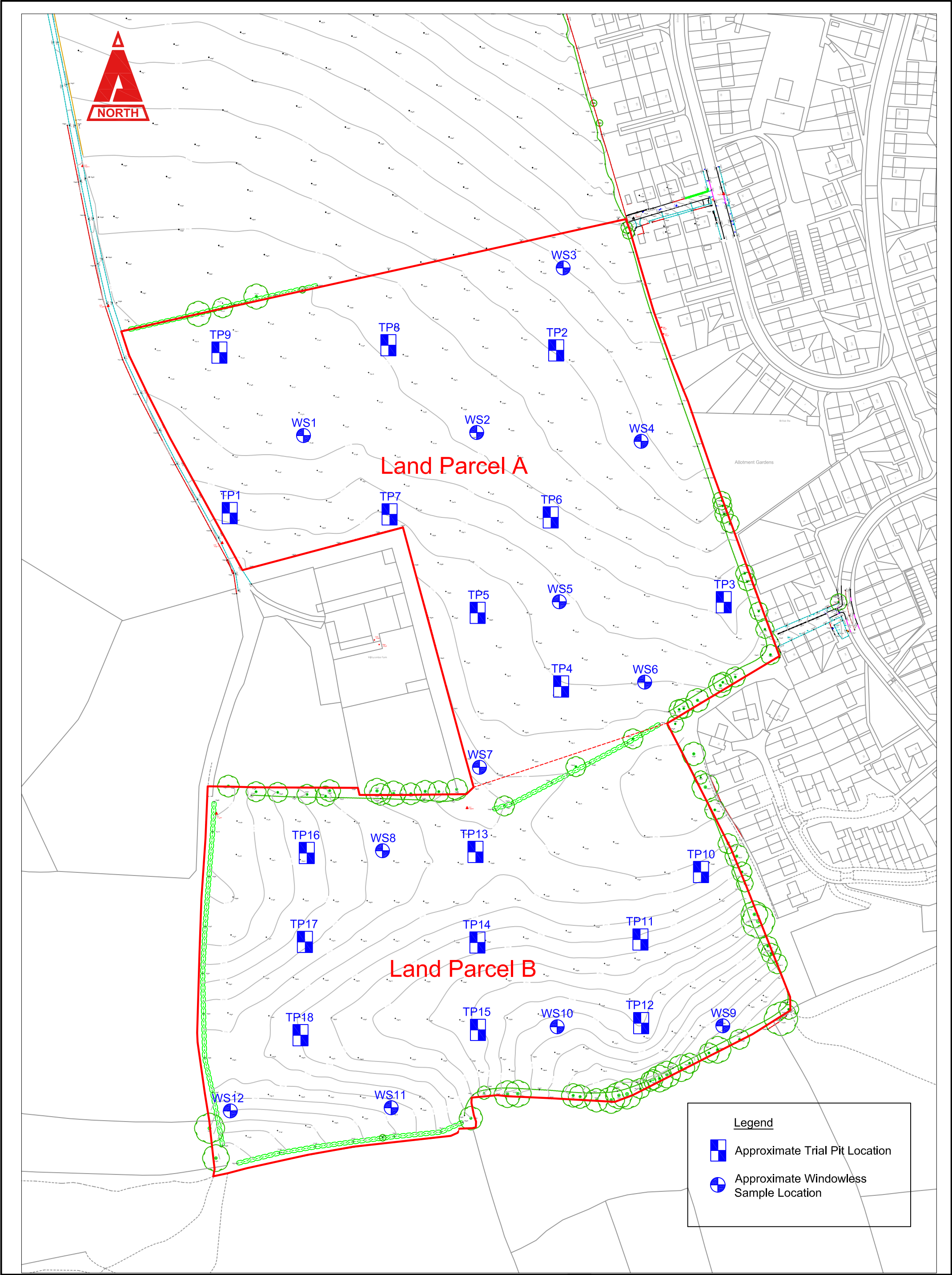


Figure 2: Site Plan

#### **Appendix 4: Thames Water Correspondence**

BWB Consulting Limited  
5th Floor, Waterfront House Waterfront House

NOTTINGHAM  
NG2 3DQ

**Search address supplied** Withycombe Farm  
1  
Balmoral Avenue  
Banbury  
OX16 0JU

**Your reference** BMP2135

**Our reference** ALS/ALS Standard/2022\_4585444

**Search date** 10 February 2022

## Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0800 009 4540



**Search address supplied:** Withycombe Farm, 1, Balmoral Avenue, Banbury, OX16 0JU

Dear Sir / Madam

**An Asset Location Search is recommended when undertaking a site development.** It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

## **Contact Us**

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd  
Property Searches  
PO Box 3189  
Slough  
SL1 4WW

Email: [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



## **Waste Water Services**

**Please provide a copy extract from the public sewer map.**

The following quartiles have been printed as they fall within Thames' sewerage area:

SP4340SE  
SP4339NE

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

The following quartiles have not been printed as they contain no assets:

SP4339NW  
SP4340SW

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

## **Clean Water Services**

**Please provide a copy extract from the public water main map.**

The following quartiles have been printed as they fall within Thames' water area:

SP4339NW  
SP4340SE  
SP4340SW  
SP4339NE

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

### **Payment for this Search**

A charge will be added to your suppliers account.

## **Further contacts:**

### **Waste Water queries**

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

### **Clean Water queries**

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 443750,240250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
841F	n/a	n/a
841G	n/a	n/a
7455	134.52	132.66
741B	n/a	n/a
7457	136.25	134.16
7456	136.19	131.25
7406	136.07	131.04
7407	136.31	134.15
741E	n/a	n/a
641P	n/a	n/a
721B	n/a	n/a
741A	n/a	n/a
741C	n/a	n/a
7454	136.22	131.05
7405	136.14	130.92
741D	n/a	n/a
7354	137.15	133.97
7303	137.07	133.9
7453	135.58	133.57
741F	n/a	n/a
7452	135.46	130.63
7402	135.28	130.64
7451	134.71	130.3
7401	134.43	130.29
8401	133.82	130.12
841E	n/a	n/a
8361	132.88	129.97
841C	n/a	n/a
841D	n/a	n/a
8451	132.23	130.74
8453	131.47	129
8452	131.33	128.85
831A	n/a	n/a
8358	130.09	126.95
841A	n/a	n/a
8307	130.03	127.44
841B	n/a	n/a
941A	n/a	n/a
9402	130.37	129.14
931A	n/a	n/a
941C	n/a	n/a
9354	132.59	130.15
9353	132.46	129.74
941D	n/a	n/a
9302	132.23	129.63
9255	n/a	n/a
9401	129	125.77
9494	n/a	n/a
9201	142.87	141.09
9202	142.77	138.84
911A	n/a	n/a
9203	140.18	137.06
9251	143.56	140.97
9303	n/a	n/a
921D	n/a	n/a
9252	143.3	140.45
921E	n/a	n/a
921C	n/a	n/a
9352	134.23	130.8
9351	134.13	131.07
941E	n/a	n/a
5454	144.95	143.25
5401	144.94	143.75
641H	n/a	n/a
641N	n/a	n/a
641O	n/a	n/a
641I	n/a	n/a
6309	145	142.04
6357	143.75	141.12
6307	143.66	141.62
6356	143.036	140.956
6306	142.91	141.34
531A	n/a	n/a
5451	145.88	141.41
641C	n/a	n/a
5403	145.69	142.49
641E	n/a	n/a
541C	n/a	n/a
541D	n/a	n/a
541E	n/a	n/a
6451	142.36	140.12
541A	n/a	n/a
641A	n/a	n/a
641G	n/a	n/a
6401	142.03	139.81
541B	n/a	n/a
641B	n/a	n/a
641L	n/a	n/a
641F	n/a	n/a
5453	145.87	142.01
5402	145.52	143.06

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5452	145.88	141.95
641D	n/a	n/a
6403	141.23	138.52
621A	n/a	n/a
621E	n/a	n/a
6252	149.22	147.69
6253	148.58	146.8
521A	n/a	n/a
521B	n/a	n/a
531B	n/a	n/a
6351	146.62	144.4
6301	145.36	143.22
6302	144.08	142.23
6352	144.31	141.8
6304	144.01	140.46
6354	143.98	140.74
6353	143.8	140.24
6303	143.87	140.1
631C	n/a	n/a
7301	141.99	138.18
6355	143.63	140.57
631D	n/a	n/a
6305	143.77	140.79
531C	n/a	n/a
631A	n/a	n/a
631B	n/a	n/a
6308	144.19	142.68
531D	n/a	n/a
6358	145.06	141.18
5301	146.09	142.69
8252	139.1	135.99
8253	139.47	136.42
831C	n/a	n/a
831D	n/a	n/a
8353	132.86	130.92
8354	132.97	130.63
8303	132.83	130.17
8359	131.1	128.41
821C	n/a	n/a
8308	131.01	127.85
8201	141.55	138.51
8202	141.46	138.12
8251	141.52	138.58
8357	130.9	128.85
8355	131.71	129.2
8304	131.61	128.71
8306	130.81	128.43
8356	131.84	129.64
821B	n/a	n/a
8305	131.75	129.43
831F	n/a	n/a
821A	n/a	n/a
831G	n/a	n/a
831E	n/a	n/a
921B	n/a	n/a
931B	n/a	n/a
921A	n/a	n/a
7352	141.87	138.83
7256	143.32	141.05
7203	143.74	141.59
7255	142.92	140.72
731D	n/a	n/a
7302	139.77	135.92
7353	139.44	136.27
721A	n/a	n/a
731E	n/a	n/a
7351	138.79	136.47
7202	139.73	137.4
7251	139.63	137.68
731A	n/a	n/a
7252	139.35	137.13
7204	139.13	136.84
731B	n/a	n/a
7253	138.56	134.89
7205	138.82	134.75
8204	137.16	134.26
8205	136.03	133.63
8206	135.97	133.52
8352	135.05	132.29
8351	135.31	133.35
8301	135.17	133.19
8302	134.78	131.88
831B	n/a	n/a
8203	139.02	135.39
5102	151.57	150.22
5105	151.6	149.6
5104	152.56	149.43
5101	152.85	149.66
5103	n/a	n/a
6160	152.49	149
6159	151.47	148.84
6002	n/a	n/a
6163	151.35	149.15

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6251	148.54	146.14
6158	150.3	148.66
6162	n/a	n/a
621B	n/a	n/a
621C	n/a	n/a
621D	n/a	n/a
6157	151.693	148.343
6161	151.3	148.81
6151	146.91	144.2
6101	146.93	143.84
621F	n/a	n/a
611C	n/a	n/a
6001	150.87	148.32
6003	n/a	n/a
6152	146.54	143.91
611B	n/a	n/a
611A	n/a	n/a
711A	n/a	n/a
7163	n/a	n/a
7159	143.64	139.95
7164	n/a	n/a
7103	150.29	148.44
7162	n/a	n/a
7102	150.51	148.82
7101	150.36	148.7
7201	142.87	140.38
7151	150.29	147.02
7155	144.11	141.78
7051	152.9	149.44
7152	150.54	149.14
7154	148.93	145.83
7104	144.76	143.22
7158	144.45	142.34
7105	144.64	141.88
7254	139.37	137.67
7206	139.36	137.99
7153	149.7	148.21
7157	143.39	141.41
7156	141.73	140.34
7106	141.93	140.44
8152	149.04	146.44
8102	149.07	146.47
8151	150.3	149.03
8101	150.31	148.79
8153	148.76	146.85
7001	152.9	149.7
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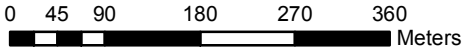
The width of the displayed area is 500m and the centre of the map is located at OS coordinates 443750,239750

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8950	151.53	149.6
8801	150.41	148.56
8850	149.62	146.79
8802	147.72	145.16
8851	145.85	143.3
881A	n/a	n/a
8803	143.5	140.68
9850	141.9	139.57
981D	n/a	n/a
9801	140.05	137.4
981A	n/a	n/a
981B	n/a	n/a
981C	n/a	n/a
9851	140.68	138.25
9950	150.32	148.72
9853	137.31	135.24
9802	136.2	134.96
9852	142.69	141.06
971A	n/a	n/a
9652	130.41	129.76
971D	n/a	n/a
971E	n/a	n/a
9752	132.58	131.58
9650	130.6	129.97
971G	131.18	128.94
971F	131.3	128.9
971I	n/a	n/a
9750	135.08	133.26
9703	134.76	134
971H	n/a	n/a
9751	133.92	130.76
971C	n/a	n/a
9702	134.67	133.81
971B	n/a	n/a
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The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

**Scale:** 1:7162  
**Width:** 2000m  
**Printed By:** Rveldhur  
**Print Date:** 10/02/2022  
**Map Centre:** 443392,240195  
**Grid Reference:** SP4340SW

**Comments:**





# Asset Location Search - Sewer Key

## Public Sewer Types (Operated and maintained by Thames Water)

	<b>Foul Sewer:</b> A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	<b>Surface Water Sewer:</b> A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	<b>Combined Sewer:</b> A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	<b>Storm Sewer</b>
	<b>Sludge Sewer</b>
	<b>Foul Trunk Sewer</b>
	<b>Surface Trunk Sewer</b>
	<b>Combined Trunk Sewer</b>
	<b>Foul Rising Main</b>
	<b>Surface Water Rising Main</b>
	<b>Combined Rising Main</b>
	<b>Vacuum</b>
	<b>Thames Water Proposed</b>
	<b>Vent Pipe</b>
	<b>Gallery</b>

## Other Sewer Types (Not operated and maintained by Thames Water)

	<b>Sewer</b>		<b>Culverted Watercourse</b>
	<b>Proposed</b>		<b>Decommissioned Sewer</b>
	<b>Content of this drainage network is currently unknown</b>		<b>Ownership of this drainage network is currently unknown</b>

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	<b>Air Valve</b>		<b>Meter</b>
	<b>Dam Chase</b>		<b>Vent</b>
	<b>Fitting</b>		

## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	<b>Ancillary</b>		<b>Drop Pipe</b>
	<b>Control Valve</b>		<b>Weir</b>

## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	<b>Inlet</b>		<b>Outfall</b>
	<b>Undefined End</b>		

## Other Symbols

Symbols used on maps which do not fall under other general categories.

	<b>Change of Characteristic Indicator</b>		<b>Public / Private Pumping Station</b>
	<b>Invert Level</b>		<b>Summit</b>

## Areas

Lines denoting areas of underground surveys, etc.

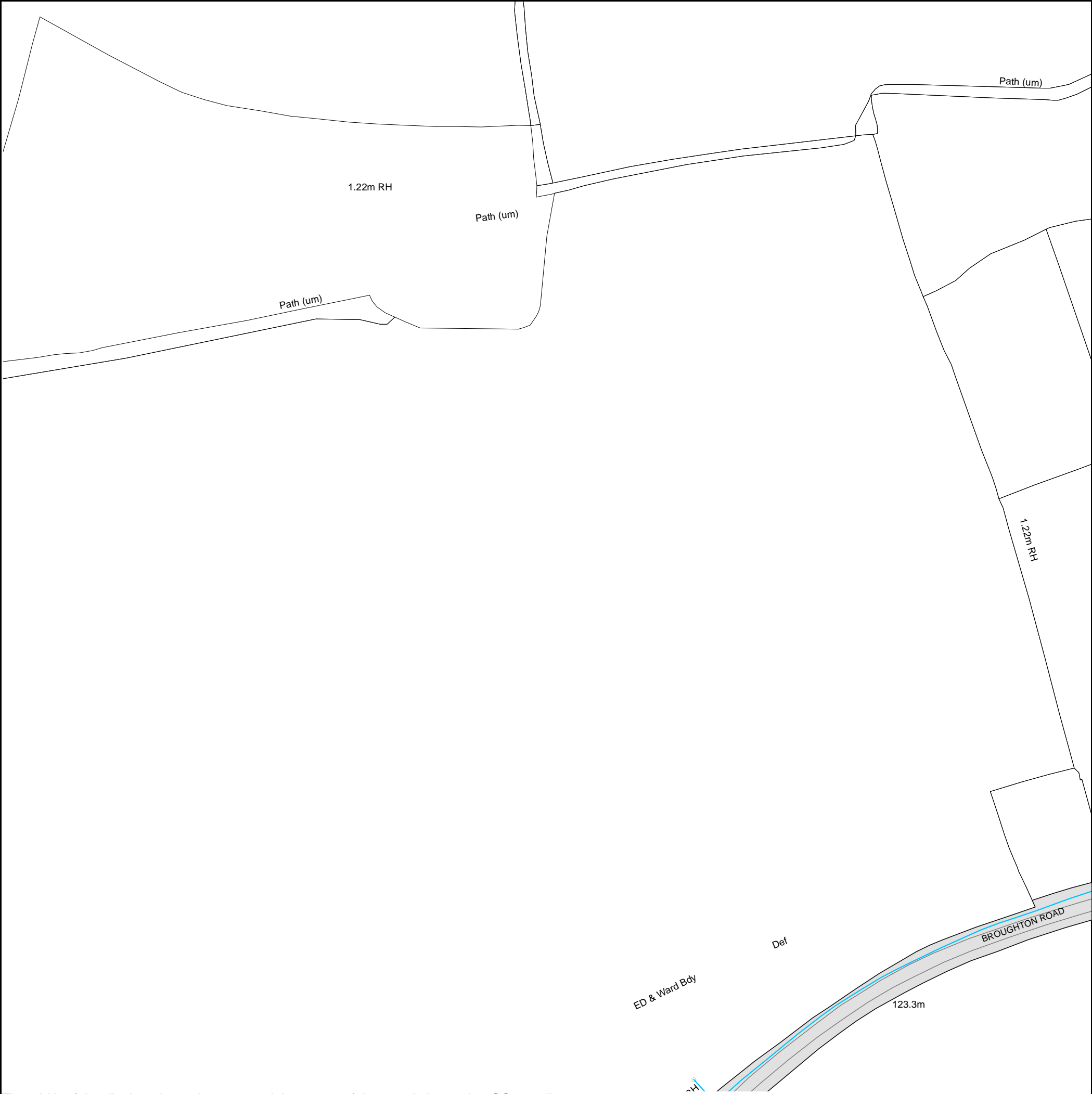
	<b>Agreement</b>
	<b>Chamber</b>
	<b>Operational Site</b>

## Ducts or Crossings

	<b>Casement</b>	Ducts may contain high voltage cables. Please check with Thames Water.
	<b>Conduit Bridge</b>	
	<b>Subway</b>	
	<b>Tunnel</b>	

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 443250,239750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 443750,240250

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# Asset Location Search - Water Key

## Water Pipes (Operated & Maintained by Thames Water)

- Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 6")
600mm and bigger (24" plus)	1200mm (4')

## Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

## Hydrants

- Single Hydrant

## Meters

- Meter

## End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

## Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

## Other Symbols

- Data Logger
- Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

## Other Water Pipes (Not Operated or Maintained by Thames Water)

- Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
- Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

## Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.


If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

## Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call <b>0800 009 4540</b> quoting your invoice number starting CBA or ADS / OSS	Account number <b>90478703</b> Sort code <b>60-00-01</b> A remittance advice must be sent to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b> or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a>	By calling your bank and quoting: Account number <b>90478703</b> Sort code <b>60-00-01</b> and your invoice number	Made payable to ' <b>Thames Water Utilities Ltd</b> ' Write your Thames Water account number on the back. Send to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b> or by DX to <b>151280 Slough 13</b>

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

## **Appendix 5: Greenfield Runoff Rate**

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		
Date 06/06/2022 16:54 File FEH Storage.SRCX	Designed by Ryan.Davies Checked by	
Innovyze Source Control 2020.1		

ICP SUDS Mean Annual Flood

Input


Return Period (years)	100	Soil	0.150
Area (ha)	6.950	Urban	0.000
SAAR (mm)	700	Region Number	Region 6

**Results 1/s**

QBAR Rural	2.8
QBAR Urban	2.8
Q100 years	9.0
Q1 year	2.4
Q30 years	6.4
Q100 years	9.0


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## **Appendix 6: Greenfield Runoff Volume**


BWB Consulting Ltd		Page 1																										
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ																												
Date 06/06/2022 16:57 File FEH Storage.SRCX	Designed by Ryan.Davies Checked by																											
Innovyze		Source Control 2020.1																										
<p style="text-align: center;"><u>Greenfield Runoff Volume</u></p> <p style="text-align: center;">FEH Data</p> <table> <tr> <td>Return Period (years)</td> <td>100</td> </tr> <tr> <td>Storm Duration (mins)</td> <td>360</td> </tr> <tr> <td>FEH Rainfall Version</td> <td>2013</td> </tr> <tr> <td>Site Location</td> <td>GB 445200 240800 SP 45200 40800</td> </tr> <tr> <td>Data Type</td> <td>Catchment</td> </tr> <tr> <td>Areal Reduction Factor</td> <td>1.00</td> </tr> <tr> <td>Area (ha)</td> <td>6.950</td> </tr> <tr> <td>SAAR (mm)</td> <td>645</td> </tr> <tr> <td>CWI</td> <td>95.100</td> </tr> <tr> <td>SPR Host</td> <td>24.860</td> </tr> <tr> <td>URBEXT (1990)</td> <td>0.3840</td> </tr> </table> <p style="text-align: center;">Results</p> <table> <tr> <td>Percentage Runoff (%)</td> <td>33.35</td> </tr> <tr> <td>Greenfield Runoff Volume (m³)</td> <td>1576.233</td> </tr> </table>			Return Period (years)	100	Storm Duration (mins)	360	FEH Rainfall Version	2013	Site Location	GB 445200 240800 SP 45200 40800	Data Type	Catchment	Areal Reduction Factor	1.00	Area (ha)	6.950	SAAR (mm)	645	CWI	95.100	SPR Host	24.860	URBEXT (1990)	0.3840	Percentage Runoff (%)	33.35	Greenfield Runoff Volume (m³)	1576.233
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©1982-2020 Innovyze																												



## **Appendix 7: FEH Storage Calculations**

BWB Consulting Ltd				Page 1																																																																																																																																																																																																																			
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		BMP2135 Withycombe Farm Catchment 1 FEH Storage																																																																																																																																																																																																																					
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<p><u>Summary of Results for 100 year Return Period (+40%)</u></p> <p>Half Drain Time : 1094 minutes.</p> <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>98.989</td><td>0.289</td><td>4.0</td><td>241.2</td><td>O K</td></tr><tr><td>30 min Summer</td><td>99.071</td><td>0.371</td><td>4.3</td><td>316.0</td><td>O K</td></tr><tr><td>60 min Summer</td><td>99.150</td><td>0.450</td><td>4.6</td><td>391.7</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.211</td><td>0.511</td><td>4.8</td><td>451.4</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.247</td><td>0.547</td><td>4.9</td><td>486.8</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.270</td><td>0.570</td><td>5.0</td><td>510.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.297</td><td>0.597</td><td>5.1</td><td>537.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>99.308</td><td>0.608</td><td>5.2</td><td>549.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>99.310</td><td>0.610</td><td>5.2</td><td>551.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>99.306</td><td>0.606</td><td>5.2</td><td>547.4</td><td>O K</td></tr><tr><td>960 min Summer</td><td>99.291</td><td>0.591</td><td>5.1</td><td>531.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>99.258</td><td>0.558</td><td>5.0</td><td>498.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>99.211</td><td>0.511</td><td>4.8</td><td>450.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>99.171</td><td>0.471</td><td>4.7</td><td>411.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>99.109</td><td>0.409</td><td>4.5</td><td>352.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>99.061</td><td>0.361</td><td>4.3</td><td>306.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>99.025</td><td>0.325</td><td>4.2</td><td>273.7</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>98.996</td><td>0.296</td><td>4.1</td><td>247.8</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>98.973</td><td>0.273</td><td>4.0</td><td>227.1</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.021</td><td>0.321</td><td>4.1</td><td>270.6</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>150.640</td><td>0.0</td><td>26</td></tr><tr><td>30 min Summer</td><td>99.120</td><td>0.0</td><td>41</td></tr><tr><td>60 min Summer</td><td>62.160</td><td>0.0</td><td>70</td></tr><tr><td>120 min Summer</td><td>36.680</td><td>0.0</td><td>130</td></tr><tr><td>180 min Summer</td><td>26.967</td><td>0.0</td><td>188</td></tr><tr><td>240 min Summer</td><td>21.665</td><td>0.0</td><td>248</td></tr><tr><td>360 min Summer</td><td>15.867</td><td>0.0</td><td>366</td></tr><tr><td>480 min Summer</td><td>12.667</td><td>0.0</td><td>484</td></tr><tr><td>600 min Summer</td><td>10.597</td><td>0.0</td><td>602</td></tr><tr><td>720 min Summer</td><td>9.135</td><td>0.0</td><td>720</td></tr><tr><td>960 min Summer</td><td>7.184</td><td>0.0</td><td>834</td></tr><tr><td>1440 min Summer</td><td>5.081</td><td>0.0</td><td>1076</td></tr><tr><td>2160 min Summer</td><td>3.568</td><td>0.0</td><td>1476</td></tr><tr><td>2880 min Summer</td><td>2.780</td><td>0.0</td><td>1880</td></tr><tr><td>4320 min Summer</td><td>1.971</td><td>0.0</td><td>2688</td></tr><tr><td>5760 min Summer</td><td>1.560</td><td>0.0</td><td>3512</td></tr><tr><td>7200 min Summer</td><td>1.320</td><td>0.0</td><td>4256</td></tr><tr><td>8640 min Summer</td><td>1.162</td><td>0.0</td><td>5024</td></tr><tr><td>10080 min Summer</td><td>1.052</td><td>0.0</td><td>5768</td></tr><tr><td>15 min Winter</td><td>150.640</td><td>0.0</td><td>26</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration 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720 min Summer	9.135	0.0	720																																																																																																																																																																																																																				
960 min Summer	7.184	0.0	834																																																																																																																																																																																																																				
1440 min Summer	5.081	0.0	1076																																																																																																																																																																																																																				
2160 min Summer	3.568	0.0	1476																																																																																																																																																																																																																				
2880 min Summer	2.780	0.0	1880																																																																																																																																																																																																																				
4320 min Summer	1.971	0.0	2688																																																																																																																																																																																																																				
5760 min Summer	1.560	0.0	3512																																																																																																																																																																																																																				
7200 min Summer	1.320	0.0	4256																																																																																																																																																																																																																				
8640 min Summer	1.162	0.0	5024																																																																																																																																																																																																																				
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		BMP2135 Withycombe Farm Catchment 1 FEH Storage			
Date 10/06/2022 13:32 File Catchment 1 FEH Storage...		Designed by Ryan.Davies 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 Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	99.112	0.412	4.5	354.6	O K
60 min Winter	99.200	0.500	4.8	440.1	O K
120 min Winter	99.268	0.568	5.0	508.4	O K
180 min Winter	99.308	0.608	5.2	549.6	O K
240 min Winter	99.335	0.635	5.3	577.4	O K
360 min Winter	99.367	0.667	5.4	611.0	O K
480 min Winter	99.382	0.682	5.4	627.0	O K
600 min Winter	99.387	0.687	5.5	632.3	O K
720 min Winter	99.385	0.685	5.4	630.9	O K
960 min Winter	99.371	0.671	5.4	615.8	O K
1440 min Winter	99.332	0.632	5.3	574.3	O K
2160 min Winter	99.275	0.575	5.0	515.3	O K
2880 min Winter	99.223	0.523	4.9	462.7	O K
4320 min Winter	99.136	0.436	4.5	377.7	O K
5760 min Winter	99.066	0.366	4.3	312.1	O K
7200 min Winter	99.013	0.313	4.1	263.3	O K
8640 min Winter	98.970	0.270	4.0	224.7	O K
10080 min Winter	98.935	0.235	3.8	193.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	99.120	0.0	41		
60 min Winter	62.160	0.0	70		
120 min Winter	36.680	0.0	128		
180 min Winter	26.967	0.0	184		
240 min Winter	21.665	0.0	242		
360 min Winter	15.867	0.0	358		
480 min Winter	12.667	0.0	474		
600 min Winter	10.597	0.0	586		
720 min Winter	9.135	0.0	698		
960 min Winter	7.184	0.0	912		
1440 min Winter	5.081	0.0	1136		
2160 min Winter	3.568	0.0	1596		
2880 min Winter	2.780	0.0	2048		
4320 min Winter	1.971	0.0	2904		
5760 min Winter	1.560	0.0	3744		
7200 min Winter	1.320	0.0	4544		
8640 min Winter	1.162	0.0	5352		
10080 min Winter	1.052	0.0	6056		
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 1 FEH Storage	
Date 10/06/2022 13:32 File Catchment 1 FEH Storage...	Designed by Ryan.Davies Checked by	
Innovyze Source Control 2020.1		

Rainfall Details


Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 445200 240800 SP 45200 40800
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) 0.870

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.290	4 8	0.290	8 12	0.290


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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 1 FEH Storage									
Date 10/06/2022 13:32 File Catchment 1 FEH Storage...	Designed by Ryan.Davies Checked by									
Innovyze	Source Control 2020.1									
<div>Model Details</div> <div>Storage is Online Cover Level (m) 100.000</div> <div>Infiltration Basin Structure</div> <div>Invert Level (m) 98.700 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.02810 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.02810</div> <table><thead><tr><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>777.1</td><td>1.300</td><td>1376.0</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	777.1	1.300	1376.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)							
0.000	777.1	1.300	1376.0							
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<p style="text-align: center;"><u>Summary of Results for 100 year Return Period (+40%)</u></p> <p style="text-align: center;">Half Drain Time : 73 minutes.</p> <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>99.153</td><td>0.453</td><td>90.9</td><td>479.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>99.254</td><td>0.554</td><td>97.6</td><td>599.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>99.307</td><td>0.607</td><td>101.1</td><td>664.9</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.284</td><td>0.584</td><td>99.6</td><td>636.4</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.255</td><td>0.555</td><td>97.6</td><td>600.8</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.225</td><td>0.525</td><td>95.7</td><td>564.9</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.166</td><td>0.466</td><td>91.8</td><td>495.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>99.109</td><td>0.409</td><td>88.1</td><td>428.8</td><td>O K</td></tr><tr><td>600 min Summer</td><td>99.055</td><td>0.355</td><td>84.6</td><td>367.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>99.005</td><td>0.305</td><td>81.4</td><td>312.1</td><td>O K</td></tr><tr><td>960 min Summer</td><td>98.918</td><td>0.218</td><td>75.8</td><td>219.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>98.800</td><td>0.100</td><td>68.3</td><td>97.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>98.745</td><td>0.045</td><td>58.2</td><td>43.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>98.735</td><td>0.035</td><td>45.6</td><td>34.0</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>98.725</td><td>0.025</td><td>32.5</td><td>24.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>98.720</td><td>0.020</td><td>26.0</td><td>19.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>98.717</td><td>0.017</td><td>22.1</td><td>16.4</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>98.715</td><td>0.015</td><td>19.5</td><td>14.4</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>98.714</td><td>0.014</td><td>17.6</td><td>13.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.208</td><td>0.508</td><td>94.5</td><td>543.6</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>150.640</td><td>0.0</td><td>23</td></tr><tr><td>30 min Summer</td><td>99.120</td><td>0.0</td><td>35</td></tr><tr><td>60 min Summer</td><td>62.160</td><td>0.0</td><td>60</td></tr><tr><td>120 min Summer</td><td>36.680</td><td>0.0</td><td>92</td></tr><tr><td>180 min Summer</td><td>26.967</td><td>0.0</td><td>126</td></tr><tr><td>240 min Summer</td><td>21.665</td><td>0.0</td><td>160</td></tr><tr><td>360 min Summer</td><td>15.867</td><td>0.0</td><td>228</td></tr><tr><td>480 min Summer</td><td>12.667</td><td>0.0</td><td>292</td></tr><tr><td>600 min Summer</td><td>10.597</td><td>0.0</td><td>356</td></tr><tr><td>720 min Summer</td><td>9.135</td><td>0.0</td><td>418</td></tr><tr><td>960 min Summer</td><td>7.184</td><td>0.0</td><td>538</td></tr><tr><td>1440 min Summer</td><td>5.081</td><td>0.0</td><td>766</td></tr><tr><td>2160 min Summer</td><td>3.568</td><td>0.0</td><td>1104</td></tr><tr><td>2880 min Summer</td><td>2.780</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>1.971</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.560</td><td>0.0</td><td>2912</td></tr><tr><td>7200 min Summer</td><td>1.320</td><td>0.0</td><td>3656</td></tr><tr><td>8640 min Summer</td><td>1.162</td><td>0.0</td><td>4320</td></tr><tr><td>10080 min Summer</td><td>1.052</td><td>0.0</td><td>5112</td></tr><tr><td>15 min 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Winter	99.208	0.508	94.5	543.6	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	150.640	0.0	23	30 min Summer	99.120	0.0	35	60 min Summer	62.160	0.0	60	120 min Summer	36.680	0.0	92	180 min Summer	26.967	0.0	126	240 min Summer	21.665	0.0	160	360 min Summer	15.867	0.0	228	480 min Summer	12.667	0.0	292	600 min Summer	10.597	0.0	356	720 min Summer	9.135	0.0	418	960 min Summer	7.184	0.0	538	1440 min Summer	5.081	0.0	766	2160 min Summer	3.568	0.0	1104	2880 min Summer	2.780	0.0	1468	4320 min Summer	1.971	0.0	2204	5760 min Summer	1.560	0.0	2912	7200 min Summer	1.320	0.0	3656	8640 min Summer	1.162	0.0	4320	10080 min Summer	1.052	0.0	5112	15 min Winter	150.640	0.0	23
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Date 10/06/2022 13:34 File Catchment 2 FEH Storage...		Designed by Ryan.Davies 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 Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	99.323	0.623	102.1	683.9	O K
60 min Winter	99.389	0.689	106.5	768.2	O K
120 min Winter	99.361	0.661	104.7	732.8	O K
180 min Winter	99.320	0.620	101.9	681.1	O K
240 min Winter	99.276	0.576	99.0	626.4	O K
360 min Winter	99.188	0.488	93.2	520.4	O K
480 min Winter	99.104	0.404	87.8	423.5	O K
600 min Winter	99.028	0.328	82.8	337.4	O K
720 min Winter	98.959	0.259	78.4	262.6	O K
960 min Winter	98.845	0.145	71.2	143.5	O K
1440 min Winter	98.746	0.046	60.2	44.8	O K
2160 min Winter	98.733	0.033	42.4	31.7	O K
2880 min Winter	98.726	0.026	33.2	24.6	O K
4320 min Winter	98.718	0.018	23.4	17.6	O K
5760 min Winter	98.715	0.015	18.9	14.0	O K
7200 min Winter	98.712	0.012	15.7	12.0	O K
8640 min Winter	98.711	0.011	14.4	10.6	O K
10080 min Winter	98.710	0.010	13.1	9.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	99.120	0.0	35		
60 min Winter	62.160	0.0	60		
120 min Winter	36.680	0.0	98		
180 min Winter	26.967	0.0	136		
240 min Winter	21.665	0.0	172		
360 min Winter	15.867	0.0	244		
480 min Winter	12.667	0.0	312		
600 min Winter	10.597	0.0	376		
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960 min Winter	7.184	0.0	554		
1440 min Winter	5.081	0.0	740		
2160 min Winter	3.568	0.0	1104		
2880 min Winter	2.780	0.0	1452		
4320 min Winter	1.971	0.0	2204		
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 2 FEH Storage	
Date 10/06/2022 13:34 File Catchment 2 FEH Storage...	Designed by Ryan.Davies Checked by	
Innovyze Source Control 2020.1		

Rainfall Details


Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 445200 240800 SP 45200 40800
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) 2.020


Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.673	4 8	0.673	8 12	0.673

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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 2 FEH Storage									
Date 10/06/2022 13:34 File Catchment 2 FEH Storage...	Designed by Ryan.Davies Checked by									
Innovyze	Source Control 2020.1									
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Depth (m)	Area (m²)	Depth (m)	Area (m²)							
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Summer</td><td>99.016</td><td>0.316</td><td>96.3</td><td>215.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>98.951</td><td>0.251</td><td>90.5</td><td>167.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>98.896</td><td>0.196</td><td>85.6</td><td>128.7</td><td>O K</td></tr><tr><td>960 min Summer</td><td>98.811</td><td>0.111</td><td>78.2</td><td>71.4</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>98.746</td><td>0.046</td><td>67.2</td><td>29.2</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>98.733</td><td>0.033</td><td>47.2</td><td>20.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>98.726</td><td>0.026</td><td>36.9</td><td>16.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>98.719</td><td>0.019</td><td>26.8</td><td>11.6</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>98.715</td><td>0.015</td><td>21.0</td><td>9.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>98.713</td><td>0.013</td><td>18.1</td><td>7.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>98.711</td><td>0.011</td><td>16.0</td><td>7.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>98.710</td><td>0.010</td><td>14.6</td><td>6.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.256</td><td>0.556</td><td>118.3</td><td>404.1</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>150.640</td><td>0.0</td><td>22</td></tr><tr><td>30 min Summer</td><td>99.120</td><td>0.0</td><td>32</td></tr><tr><td>60 min Summer</td><td>62.160</td><td>0.0</td><td>50</td></tr><tr><td>120 min Summer</td><td>36.680</td><td>0.0</td><td>84</td></tr><tr><td>180 min Summer</td><td>26.967</td><td>0.0</td><td>118</td></tr><tr><td>240 min Summer</td><td>21.665</td><td>0.0</td><td>152</td></tr><tr><td>360 min Summer</td><td>15.867</td><td>0.0</td><td>216</td></tr><tr><td>480 min Summer</td><td>12.667</td><td>0.0</td><td>278</td></tr><tr><td>600 min Summer</td><td>10.597</td><td>0.0</td><td>338</td></tr><tr><td>720 min Summer</td><td>9.135</td><td>0.0</td><td>398</td></tr><tr><td>960 min Summer</td><td>7.184</td><td>0.0</td><td>512</td></tr><tr><td>1440 min Summer</td><td>5.081</td><td>0.0</td><td>736</td></tr><tr><td>2160 min Summer</td><td>3.568</td><td>0.0</td><td>1100</td></tr><tr><td>2880 min Summer</td><td>2.780</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>1.971</td><td>0.0</td><td>2180</td></tr><tr><td>5760 min Summer</td><td>1.560</td><td>0.0</td><td>2928</td></tr><tr><td>7200 min Summer</td><td>1.320</td><td>0.0</td><td>3600</td></tr><tr><td>8640 min Summer</td><td>1.162</td><td>0.0</td><td>4312</td></tr><tr><td>10080 min Summer</td><td>1.052</td><td>0.0</td><td>5072</td></tr><tr><td>15 min Winter</td><td>150.640</td><td>0.0</td><td>22</td></tr></tbody></table>							Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	99.197	0.497	112.8	355.2	O K	30 min Summer	99.291	0.591	121.5	433.8	O K	60 min Summer	99.319	0.619	124.1	457.7	O K	120 min Summer	99.270	0.570	119.5	415.4	O K	180 min Summer	99.222	0.522	115.1	375.6	O K	240 min Summer	99.176	0.476	110.9	338.4	O K	360 min Summer	99.091	0.391	103.1	271.6	O K	480 min Summer	99.016	0.316	96.3	215.0	O K	600 min Summer	98.951	0.251	90.5	167.7	O K	720 min Summer	98.896	0.196	85.6	128.7	O K	960 min Summer	98.811	0.111	78.2	71.4	O K	1440 min Summer	98.746	0.046	67.2	29.2	O K	2160 min Summer	98.733	0.033	47.2	20.8	O K	2880 min Summer	98.726	0.026	36.9	16.2	O K	4320 min Summer	98.719	0.019	26.8	11.6	O K	5760 min Summer	98.715	0.015	21.0	9.2	O K	7200 min Summer	98.713	0.013	18.1	7.9	O K	8640 min Summer	98.711	0.011	16.0	7.0	O K	10080 min Summer	98.710	0.010	14.6	6.3	O K	15 min Winter	99.256	0.556	118.3	404.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	150.640	0.0	22	30 min Summer	99.120	0.0	32	60 min Summer	62.160	0.0	50	120 min Summer	36.680	0.0	84	180 min Summer	26.967	0.0	118	240 min Summer	21.665	0.0	152	360 min Summer	15.867	0.0	216	480 min Summer	12.667	0.0	278	600 min Summer	10.597	0.0	338	720 min Summer	9.135	0.0	398	960 min Summer	7.184	0.0	512	1440 min Summer	5.081	0.0	736	2160 min Summer	3.568	0.0	1100	2880 min Summer	2.780	0.0	1468	4320 min Summer	1.971	0.0	2180	5760 min Summer	1.560	0.0	2928	7200 min Summer	1.320	0.0	3600	8640 min Summer	1.162	0.0	4312	10080 min Summer	1.052	0.0	5072	15 min Winter	150.640	0.0	22
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Date 10/06/2022 13:35 File Catchment 3 FEH Storage...		Designed by Ryan.Davies Checked by			
Innovyze		Source Control 2020.1			
<p><u>Summary of Results for 100 year Return Period (+40%)</u></p>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	99.364	0.664	128.3	496.8	O K
60 min Winter	99.398	0.698	131.5	527.1	O K
120 min Winter	99.329	0.629	125.0	466.3	O K
180 min Winter	99.257	0.557	118.3	405.0	O K
240 min Winter	99.189	0.489	112.0	348.8	O K
360 min Winter	99.067	0.367	100.9	253.0	O K
480 min Winter	98.964	0.264	91.7	177.0	O K
600 min Winter	98.879	0.179	84.1	117.0	O K
720 min Winter	98.811	0.111	78.1	71.1	O K
960 min Winter	98.747	0.047	68.7	29.9	O K
1440 min Winter	98.734	0.034	48.7	21.3	O K
2160 min Winter	98.724	0.024	34.8	15.1	O K
2880 min Winter	98.719	0.019	26.8	11.7	O K
4320 min Winter	98.714	0.014	19.6	8.5	O K
5760 min Winter	98.711	0.011	15.3	6.7	O K
7200 min Winter	98.709	0.009	13.1	5.7	O K
8640 min Winter	98.708	0.008	11.7	5.1	O K
10080 min Winter	98.707	0.007	10.3	4.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	99.120	0.0	33		
60 min Winter	62.160	0.0	54		
120 min Winter	36.680	0.0	90		
180 min Winter	26.967	0.0	126		
240 min Winter	21.665	0.0	162		
360 min Winter	15.867	0.0	228		
480 min Winter	12.667	0.0	290		
600 min Winter	10.597	0.0	350		
720 min Winter	9.135	0.0	404		
960 min Winter	7.184	0.0	494		
1440 min Winter	5.081	0.0	738		
2160 min Winter	3.568	0.0	1084		
2880 min Winter	2.780	0.0	1424		
4320 min Winter	1.971	0.0	2184		
5760 min Winter	1.560	0.0	2920		
7200 min Winter	1.320	0.0	3640		
8640 min Winter	1.162	0.0	4472		
10080 min Winter	1.052	0.0	5112		
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 3 FEH Storage	
Date 10/06/2022 13:35 File Catchment 3 FEH Storage...	Designed by Ryan.Davies Checked by	
Innovyze Source Control 2020.1		

Rainfall Details


Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 445200 240800 SP 45200 40800
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) 1.630

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0      4	0.543	4      8	0.543	8      12	0.543


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Depth (m)	Area (m²)	Depth (m)	Area (m²)							
0.000	622.9	1.300	1167.9							
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## **Appendix 8: FSR Storage Calculations**

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Summer</td><td>99.246</td><td>0.546</td><td>4.9</td><td>485.5</td><td>O K</td></tr><tr><td>600 min Summer</td><td>99.246</td><td>0.546</td><td>4.9</td><td>486.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>99.243</td><td>0.543</td><td>4.9</td><td>483.2</td><td>O K</td></tr><tr><td>960 min Summer</td><td>99.234</td><td>0.534</td><td>4.9</td><td>474.1</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>99.214</td><td>0.514</td><td>4.8</td><td>454.1</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>99.183</td><td>0.483</td><td>4.7</td><td>423.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>99.154</td><td>0.454</td><td>4.6</td><td>394.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>99.099</td><td>0.399</td><td>4.4</td><td>343.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>99.051</td><td>0.351</td><td>4.2</td><td>297.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>99.007</td><td>0.307</td><td>4.1</td><td>257.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>98.967</td><td>0.267</td><td>4.0</td><td>222.1</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>98.932</td><td>0.232</td><td>3.8</td><td>190.9</td><td>O K</td></tr><tr><td>15 min Winter</td><td>98.991</td><td>0.291</td><td>4.0</td><td>243.5</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>135.716</td><td>0.0</td><td>26</td></tr><tr><td>30 min Summer</td><td>88.952</td><td>0.0</td><td>41</td></tr><tr><td>60 min Summer</td><td>55.544</td><td>0.0</td><td>70</td></tr><tr><td>120 min Summer</td><td>33.522</td><td>0.0</td><td>130</td></tr><tr><td>180 min Summer</td><td>24.624</td><td>0.0</td><td>188</td></tr><tr><td>240 min Summer</td><td>19.670</td><td>0.0</td><td>246</td></tr><tr><td>360 min Summer</td><td>14.264</td><td>0.0</td><td>364</td></tr><tr><td>480 min Summer</td><td>11.360</td><td>0.0</td><td>484</td></tr><tr><td>600 min Summer</td><td>9.515</td><td>0.0</td><td>602</td></tr><tr><td>720 min Summer</td><td>8.228</td><td>0.0</td><td>710</td></tr><tr><td>960 min Summer</td><td>6.537</td><td>0.0</td><td>814</td></tr><tr><td>1440 min Summer</td><td>4.720</td><td>0.0</td><td>1060</td></tr><tr><td>2160 min Summer</td><td>3.403</td><td>0.0</td><td>1472</td></tr><tr><td>2880 min Summer</td><td>2.695</td><td>0.0</td><td>1880</td></tr><tr><td>4320 min Summer</td><td>1.938</td><td>0.0</td><td>2688</td></tr><tr><td>5760 min Summer</td><td>1.532</td><td>0.0</td><td>3472</td></tr><tr><td>7200 min Summer</td><td>1.276</td><td>0.0</td><td>4256</td></tr><tr><td>8640 min Summer</td><td>1.098</td><td>0.0</td><td>5016</td></tr><tr><td>10080 min Summer</td><td>0.967</td><td>0.0</td><td>5752</td></tr><tr><td>15 min Winter</td><td>135.716</td><td>0.0</td><td>26</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	98.962	0.262	3.9	217.0	O K	30 min Summer	99.035	0.335	4.2	283.1	O K	60 min Summer	99.106	0.406	4.4	349.0	O K	120 min Summer	99.170	0.470	4.7	411.0	O K	180 min Summer	99.202	0.502	4.8	442.2	O K	240 min Summer	99.220	0.520	4.9	460.1	O K	360 min Summer	99.238	0.538	4.9	478.1	O K	480 min Summer	99.246	0.546	4.9	485.5	O K	600 min Summer	99.246	0.546	4.9	486.4	O K	720 min Summer	99.243	0.543	4.9	483.2	O K	960 min Summer	99.234	0.534	4.9	474.1	O K	1440 min Summer	99.214	0.514	4.8	454.1	O K	2160 min Summer	99.183	0.483	4.7	423.7	O K	2880 min Summer	99.154	0.454	4.6	394.8	O K	4320 min Summer	99.099	0.399	4.4	343.0	O K	5760 min Summer	99.051	0.351	4.2	297.5	O K	7200 min Summer	99.007	0.307	4.1	257.5	O K	8640 min Summer	98.967	0.267	4.0	222.1	O K	10080 min Summer	98.932	0.232	3.8	190.9	O K	15 min Winter	98.991	0.291	4.0	243.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	135.716	0.0	26	30 min Summer	88.952	0.0	41	60 min Summer	55.544	0.0	70	120 min Summer	33.522	0.0	130	180 min Summer	24.624	0.0	188	240 min Summer	19.670	0.0	246	360 min Summer	14.264	0.0	364	480 min Summer	11.360	0.0	484	600 min Summer	9.515	0.0	602	720 min Summer	8.228	0.0	710	960 min Summer	6.537	0.0	814	1440 min Summer	4.720	0.0	1060	2160 min Summer	3.403	0.0	1472	2880 min Summer	2.695	0.0	1880	4320 min Summer	1.938	0.0	2688	5760 min Summer	1.532	0.0	3472	7200 min Summer	1.276	0.0	4256	8640 min Summer	1.098	0.0	5016	10080 min Summer	0.967	0.0	5752	15 min Winter	135.716	0.0	26
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		BMP2135 Withycombe Farm Catchment 1 FSR Storage				
Date 10/06/2022 13:33 File Catchment 1 FSR Storage...		Designed by Ryan.Davies 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 Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	99.072	0.372	4.3	317.7	O K	
60 min Winter	99.151	0.451	4.6	392.3	O K	
120 min Winter	99.223	0.523	4.9	463.1	O K	
180 min Winter	99.259	0.559	5.0	499.5	O K	
240 min Winter	99.281	0.581	5.1	521.0	O K	
360 min Winter	99.303	0.603	5.1	544.0	O K	
480 min Winter	99.314	0.614	5.2	555.2	O K	
600 min Winter	99.317	0.617	5.2	559.0	O K	
720 min Winter	99.317	0.617	5.2	558.4	O K	
960 min Winter	99.308	0.608	5.2	549.0	O K	
1440 min Winter	99.283	0.583	5.1	523.6	O K	
2160 min Winter	99.244	0.544	4.9	483.6	O K	
2880 min Winter	99.203	0.503	4.8	442.7	O K	
4320 min Winter	99.125	0.425	4.5	367.2	O K	
5760 min Winter	99.055	0.355	4.3	301.5	O K	
7200 min Winter	98.993	0.293	4.0	244.9	O K	
8640 min Winter	98.938	0.238	3.8	196.2	O K	
10080 min Winter	98.889	0.189	3.7	154.4	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)			
30 min Winter	88.952	0.0	41			
60 min Winter	55.544	0.0	70			
120 min Winter	33.522	0.0	126			
180 min Winter	24.624	0.0	184			
240 min Winter	19.670	0.0	242			
360 min Winter	14.264	0.0	358			
480 min Winter	11.360	0.0	472			
600 min Winter	9.515	0.0	584			
720 min Winter	8.228	0.0	694			
960 min Winter	6.537	0.0	904			
1440 min Winter	4.720	0.0	1126			
2160 min Winter	3.403	0.0	1584			
2880 min Winter	2.695	0.0	2044			
4320 min Winter	1.938	0.0	2900			
5760 min Winter	1.532	0.0	3744			
7200 min Winter	1.276	0.0	4536			
8640 min Winter	1.098	0.0	5280			
10080 min Winter	0.967	0.0	6048			
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 1 FSR Storage	
Date 10/06/2022 13:33 File Catchment 1 FSR Storage...	Designed by Ryan.Davies 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)	19.600	Shortest Storm (mins)	15
Ratio R	0.405	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40


#### Time Area Diagram

Total Area (ha) 0.870


Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4	0.290	4 8	0.290	8 12	0.290


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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 1 FSR Storage									
Date 10/06/2022 13:33 File Catchment 1 FSR Storage...	Designed by Ryan.Davies Checked by									
Innovyze	Source Control 2020.1									
<div>Model Details</div> <div>Storage is Online Cover Level (m) 100.000</div> <div>Infiltration Basin Structure</div> <div>Invert Level (m) 98.700 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.02810 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.02810</div> <table><thead><tr><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>777.1</td><td>1.300</td><td>1376.0</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	777.1	1.300	1376.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)							
0.000	777.1	1.300	1376.0							
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<p><u>Summary of Results for 100 year Return Period (+40%)</u></p> <p>Half Drain Time : 66 minutes.</p> <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>99.106</td><td>0.406</td><td>87.9</td><td>425.7</td><td>O K</td></tr><tr><td>30 min Summer</td><td>99.196</td><td>0.496</td><td>93.7</td><td>529.6</td><td>O K</td></tr><tr><td>60 min Summer</td><td>99.237</td><td>0.537</td><td>96.5</td><td>579.3</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.227</td><td>0.527</td><td>95.8</td><td>566.5</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.197</td><td>0.497</td><td>93.8</td><td>531.1</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.164</td><td>0.464</td><td>91.7</td><td>492.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.100</td><td>0.400</td><td>87.5</td><td>418.5</td><td>O K</td></tr><tr><td>480 min Summer</td><td>99.043</td><td>0.343</td><td>83.8</td><td>354.6</td><td>O K</td></tr><tr><td>600 min Summer</td><td>98.992</td><td>0.292</td><td>80.6</td><td>298.5</td><td>O K</td></tr><tr><td>720 min Summer</td><td>98.947</td><td>0.247</td><td>77.7</td><td>249.7</td><td>O K</td></tr><tr><td>960 min Summer</td><td>98.873</td><td>0.173</td><td>72.9</td><td>171.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>98.778</td><td>0.078</td><td>67.0</td><td>75.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>98.743</td><td>0.043</td><td>56.2</td><td>41.5</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>98.734</td><td>0.034</td><td>44.3</td><td>33.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>98.725</td><td>0.025</td><td>32.5</td><td>24.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>98.720</td><td>0.020</td><td>25.4</td><td>18.9</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>98.717</td><td>0.017</td><td>21.5</td><td>15.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>98.714</td><td>0.014</td><td>18.3</td><td>13.6</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>98.713</td><td>0.013</td><td>16.3</td><td>12.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.157</td><td>0.457</td><td>91.2</td><td>483.6</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>135.598</td><td>0.0</td><td>23</td></tr><tr><td>30 min Summer</td><td>88.913</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>55.544</td><td>0.0</td><td>58</td></tr><tr><td>120 min Summer</td><td>33.536</td><td>0.0</td><td>90</td></tr><tr><td>180 min Summer</td><td>24.639</td><td>0.0</td><td>124</td></tr><tr><td>240 min Summer</td><td>19.684</td><td>0.0</td><td>158</td></tr><tr><td>360 min Summer</td><td>14.278</td><td>0.0</td><td>226</td></tr><tr><td>480 min Summer</td><td>11.373</td><td>0.0</td><td>290</td></tr><tr><td>600 min Summer</td><td>9.526</td><td>0.0</td><td>354</td></tr><tr><td>720 min Summer</td><td>8.239</td><td>0.0</td><td>414</td></tr><tr><td>960 min Summer</td><td>6.547</td><td>0.0</td><td>532</td></tr><tr><td>1440 min Summer</td><td>4.728</td><td>0.0</td><td>758</td></tr><tr><td>2160 min Summer</td><td>3.409</td><td>0.0</td><td>1100</td></tr><tr><td>2880 min Summer</td><td>2.700</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>1.942</td><td>0.0</td><td>2196</td></tr><tr><td>5760 min Summer</td><td>1.535</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.279</td><td>0.0</td><td>3576</td></tr><tr><td>8640 min Summer</td><td>1.101</td><td>0.0</td><td>4336</td></tr><tr><td>10080 min Summer</td><td>0.970</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>135.598</td><td>0.0</td><td>23</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	99.106	0.406	87.9	425.7	O K	30 min Summer	99.196	0.496	93.7	529.6	O K	60 min Summer	99.237	0.537	96.5	579.3	O K	120 min Summer	99.227	0.527	95.8	566.5	O K	180 min Summer	99.197	0.497	93.8	531.1	O K	240 min Summer	99.164	0.464	91.7	492.3	O K	360 min Summer	99.100	0.400	87.5	418.5	O K	480 min Summer	99.043	0.343	83.8	354.6	O K	600 min Summer	98.992	0.292	80.6	298.5	O K	720 min Summer	98.947	0.247	77.7	249.7	O K	960 min Summer	98.873	0.173	72.9	171.5	O K	1440 min Summer	98.778	0.078	67.0	75.7	O K	2160 min Summer	98.743	0.043	56.2	41.5	O K	2880 min Summer	98.734	0.034	44.3	33.1	O K	4320 min Summer	98.725	0.025	32.5	24.0	O K	5760 min Summer	98.720	0.020	25.4	18.9	O K	7200 min Summer	98.717	0.017	21.5	15.9	O K	8640 min Summer	98.714	0.014	18.3	13.6	O K	10080 min Summer	98.713	0.013	16.3	12.0	O K	15 min Winter	99.157	0.457	91.2	483.6	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	135.598	0.0	23	30 min Summer	88.913	0.0	34	60 min Summer	55.544	0.0	58	120 min Summer	33.536	0.0	90	180 min Summer	24.639	0.0	124	240 min Summer	19.684	0.0	158	360 min Summer	14.278	0.0	226	480 min Summer	11.373	0.0	290	600 min Summer	9.526	0.0	354	720 min Summer	8.239	0.0	414	960 min Summer	6.547	0.0	532	1440 min Summer	4.728	0.0	758	2160 min Summer	3.409	0.0	1100	2880 min Summer	2.700	0.0	1468	4320 min Summer	1.942	0.0	2196	5760 min Summer	1.535	0.0	2936	7200 min Summer	1.279	0.0	3576	8640 min Summer	1.101	0.0	4336	10080 min Summer	0.970	0.0	5136	15 min Winter	135.598	0.0	23
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		BMP2135 Withycombe Farm Catchment 2 FSR Storage			
Date 10/06/2022 13:35 File Catchment 2 FSR Storage...		Designed by Ryan.Davies 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 Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	99.258	0.558	97.8	604.6	O K
60 min Winter	99.311	0.611	101.3	670.0	O K
120 min Winter	99.296	0.596	100.3	651.0	O K
180 min Winter	99.254	0.554	97.5	599.2	O K
240 min Winter	99.205	0.505	94.4	540.9	O K
360 min Winter	99.112	0.412	88.3	431.6	O K
480 min Winter	99.029	0.329	82.9	339.2	O K
600 min Winter	98.958	0.258	78.3	261.0	O K
720 min Winter	98.896	0.196	74.4	195.3	O K
960 min Winter	98.800	0.100	68.3	97.5	O K
1440 min Winter	98.743	0.043	56.2	41.6	O K
2160 min Winter	98.732	0.032	41.0	30.3	O K
2880 min Winter	98.725	0.025	32.5	24.1	O K
4320 min Winter	98.718	0.018	23.4	17.3	O K
5760 min Winter	98.714	0.014	18.3	13.9	O K
7200 min Winter	98.712	0.012	15.7	11.5	O K
8640 min Winter	98.710	0.010	13.1	9.7	O K
10080 min Winter	98.709	0.009	11.8	8.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	88.913	0.0	35		
60 min Winter	55.544	0.0	60		
120 min Winter	33.536	0.0	96		
180 min Winter	24.639	0.0	134		
240 min Winter	19.684	0.0	172		
360 min Winter	14.278	0.0	242		
480 min Winter	11.373	0.0	308		
600 min Winter	9.526	0.0	372		
720 min Winter	8.239	0.0	432		
960 min Winter	6.547	0.0	542		
1440 min Winter	4.728	0.0	736		
2160 min Winter	3.409	0.0	1096		
2880 min Winter	2.700	0.0	1472		
4320 min Winter	1.942	0.0	2160		
5760 min Winter	1.535	0.0	2936		
7200 min Winter	1.279	0.0	3560		
8640 min Winter	1.101	0.0	4408		
10080 min Winter	0.970	0.0	5024		
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 2 FSR Storage									
Date 10/06/2022 13:35 File Catchment 2 FSR Storage...	Designed by Ryan.Davies Checked by									
Innovyze	Source Control 2020.1									
<div><p><u>Model Details</u></p><p>Storage is Online Cover Level (m) 100.000</p><p><u>Infiltration Basin Structure</u></p><p>Invert Level (m) 98.700 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.46800 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.46800</p><table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>955.6</td><td>1.300</td><td>1610.4</td></tr></table></div>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	955.6	1.300	1610.4
Depth (m)	Area (m²)	Depth (m)	Area (m²)							
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<p><u>Summary of Results for 100 year Return Period (+40%)</u></p> <p>Half Drain Time : 36 minutes.</p> <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>99.146</td><td>0.446</td><td>108.1</td><td>314.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>99.228</td><td>0.528</td><td>115.7</td><td>381.0</td><td>O K</td></tr><tr><td>60 min Summer</td><td>99.247</td><td>0.547</td><td>117.4</td><td>396.8</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.212</td><td>0.512</td><td>114.1</td><td>367.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.164</td><td>0.464</td><td>109.7</td><td>328.4</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.115</td><td>0.415</td><td>105.3</td><td>290.1</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.027</td><td>0.327</td><td>97.3</td><td>222.9</td><td>O K</td></tr><tr><td>480 min Summer</td><td>98.954</td><td>0.254</td><td>90.8</td><td>170.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>98.895</td><td>0.195</td><td>85.6</td><td>128.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>98.847</td><td>0.147</td><td>81.3</td><td>95.4</td><td>O K</td></tr><tr><td>960 min Summer</td><td>98.780</td><td>0.080</td><td>75.4</td><td>50.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>98.743</td><td>0.043</td><td>62.7</td><td>27.2</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>98.732</td><td>0.032</td><td>45.7</td><td>19.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>98.725</td><td>0.025</td><td>36.2</td><td>15.7</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>98.718</td><td>0.018</td><td>26.1</td><td>11.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>98.715</td><td>0.015</td><td>21.0</td><td>9.1</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>98.712</td><td>0.012</td><td>17.4</td><td>7.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>98.711</td><td>0.011</td><td>15.3</td><td>6.6</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>98.709</td><td>0.009</td><td>13.1</td><td>5.7</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.201</td><td>0.501</td><td>113.1</td><td>358.3</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>135.716</td><td>0.0</td><td>22</td></tr><tr><td>30 min Summer</td><td>88.952</td><td>0.0</td><td>32</td></tr><tr><td>60 min Summer</td><td>55.544</td><td>0.0</td><td>50</td></tr><tr><td>120 min Summer</td><td>33.522</td><td>0.0</td><td>84</td></tr><tr><td>180 min Summer</td><td>24.624</td><td>0.0</td><td>118</td></tr><tr><td>240 min Summer</td><td>19.670</td><td>0.0</td><td>150</td></tr><tr><td>360 min Summer</td><td>14.264</td><td>0.0</td><td>214</td></tr><tr><td>480 min Summer</td><td>11.360</td><td>0.0</td><td>276</td></tr><tr><td>600 min Summer</td><td>9.515</td><td>0.0</td><td>336</td></tr><tr><td>720 min Summer</td><td>8.228</td><td>0.0</td><td>394</td></tr><tr><td>960 min Summer</td><td>6.537</td><td>0.0</td><td>506</td></tr><tr><td>1440 min Summer</td><td>4.720</td><td>0.0</td><td>734</td></tr><tr><td>2160 min Summer</td><td>3.403</td><td>0.0</td><td>1092</td></tr><tr><td>2880 min Summer</td><td>2.695</td><td>0.0</td><td>1448</td></tr><tr><td>4320 min Summer</td><td>1.938</td><td>0.0</td><td>2176</td></tr><tr><td>5760 min Summer</td><td>1.532</td><td>0.0</td><td>2888</td></tr><tr><td>7200 min Summer</td><td>1.276</td><td>0.0</td><td>3568</td></tr><tr><td>8640 min Summer</td><td>1.098</td><td>0.0</td><td>4312</td></tr><tr><td>10080 min Summer</td><td>0.967</td><td>0.0</td><td>5008</td></tr><tr><td>15 min Winter</td><td>135.716</td><td>0.0</td><td>22</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	99.146	0.446	108.1	314.3	O K	30 min Summer	99.228	0.528	115.7	381.0	O K	60 min Summer	99.247	0.547	117.4	396.8	O K	120 min Summer	99.212	0.512	114.1	367.2	O K	180 min Summer	99.164	0.464	109.7	328.4	O K	240 min Summer	99.115	0.415	105.3	290.1	O K	360 min Summer	99.027	0.327	97.3	222.9	O K	480 min Summer	98.954	0.254	90.8	170.3	O K	600 min Summer	98.895	0.195	85.6	128.4	O K	720 min Summer	98.847	0.147	81.3	95.4	O K	960 min Summer	98.780	0.080	75.4	50.8	O K	1440 min Summer	98.743	0.043	62.7	27.2	O K	2160 min Summer	98.732	0.032	45.7	19.8	O K	2880 min Summer	98.725	0.025	36.2	15.7	O K	4320 min Summer	98.718	0.018	26.1	11.3	O K	5760 min Summer	98.715	0.015	21.0	9.1	O K	7200 min Summer	98.712	0.012	17.4	7.6	O K	8640 min Summer	98.711	0.011	15.3	6.6	O K	10080 min Summer	98.709	0.009	13.1	5.7	O K	15 min Winter	99.201	0.501	113.1	358.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	135.716	0.0	22	30 min Summer	88.952	0.0	32	60 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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		BMP2135 Withycombe Farm Catchment 3 FSR Storage			
Date 10/06/2022 13:36 File Catchment 3 FSR Storage...		Designed by Ryan.Davies 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 Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	99.295	0.595	121.9	436.9	O K
60 min Winter	99.317	0.617	123.9	455.9	O K
120 min Winter	99.263	0.563	118.9	410.0	O K
180 min Winter	99.191	0.491	112.3	350.5	O K
240 min Winter	99.120	0.420	105.7	294.0	O K
360 min Winter	98.995	0.295	94.5	199.8	O K
480 min Winter	98.897	0.197	85.8	130.0	O K
600 min Winter	98.822	0.122	79.1	78.3	O K
720 min Winter	98.767	0.067	74.3	42.8	O K
960 min Winter	98.743	0.043	62.7	27.2	O K
1440 min Winter	98.732	0.032	45.7	19.8	O K
2160 min Winter	98.723	0.023	33.3	14.5	O K
2880 min Winter	98.718	0.018	26.1	11.4	O K
4320 min Winter	98.713	0.013	18.9	8.2	O K
5760 min Winter	98.711	0.011	15.3	6.6	O K
7200 min Winter	98.709	0.009	12.4	5.5	O K
8640 min Winter	98.708	0.008	11.0	4.8	O K
10080 min Winter	98.707	0.007	9.6	4.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	88.952	0.0	33		
60 min Winter	55.544	0.0	54		
120 min Winter	33.522	0.0	90		
180 min Winter	24.624	0.0	126		
240 min Winter	19.670	0.0	160		
360 min Winter	14.264	0.0	226		
480 min Winter	11.360	0.0	286		
600 min Winter	9.515	0.0	342		
720 min Winter	8.228	0.0	392		
960 min Winter	6.537	0.0	492		
1440 min Winter	4.720	0.0	730		
2160 min Winter	3.403	0.0	1096		
2880 min Winter	2.695	0.0	1452		
4320 min Winter	1.938	0.0	2188		
5760 min Winter	1.532	0.0	2920		
7200 min Winter	1.276	0.0	3640		
8640 min Winter	1.098	0.0	4200		
10080 min Winter	0.967	0.0	5128		
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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 3 FSR Storage	
Date 10/06/2022 13:36 File Catchment 3 FSR Storage...	Designed by Ryan.Davies 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)	19.600	Shortest Storm (mins)	15
Ratio R	0.405	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.630

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4 0.543	4	8 0.543	8	12 0.543

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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	BMP2135 Withycombe Farm Catchment 3 FSR Storage									
Date 10/06/2022 13:36 File Catchment 3 FSR Storage...	Designed by Ryan.Davies Checked by									
Innovyze	Source Control 2020.1									
<div>Model Details</div> <div>Storage is Online Cover Level (m) 100.000</div> <div>Infiltration Basin Structure</div> <div>Invert Level (m) 98.700 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.79200 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.79200</div> <table><thead><tr><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>622.9</td><td>1.300</td><td>1167.9</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	622.9	1.300	1167.9
Depth (m)	Area (m²)	Depth (m)	Area (m²)							
0.000	622.9	1.300	1167.9							
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## **Appendix 9: Conceptual Drainage Strategy**



