

Tritax Symmetry (Hinckley) Limited  
**HINCKLEY NATIONAL  
RAIL FREIGHT INTERCHANGE**

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**The Hinckley National Rail Freight Interchange  
Development Consent Order**  
Project reference TR050007

**Sustainable Drainage Statement (Appendices)**

Report Prepared by: BWB Consulting Ltd

Document reference: 6.2.14.2C

Revision: 06

**27 February 2024**

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations  
2009 Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017  
Regulation 14

## APPENDICES

### Appendix 1: Parameters Plan & Illustrative Layout

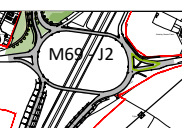



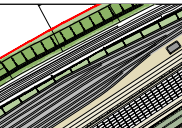
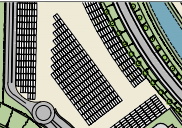

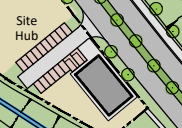
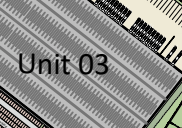
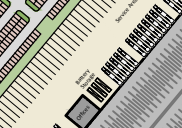


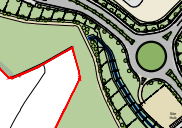



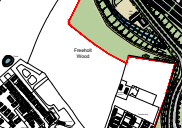

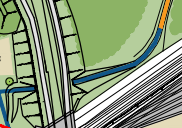
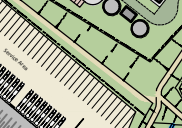








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- Key**
-  New M69 Slip Lanes
  -  A47 Link Road
  -  A47 Link Bridge Crossing
  -  Estate Roads
  -  Railport - Sidings
  -  Railport - Container Storage
  -  Lorry Park, Energy Services & Drivers Welfare
  -  Site Hub
  -  Building Footprints
  -  External Yards
  -  Parking Areas
  -  Water Features and Ponds
  -  New Bridleway within main HNRFI site
  -  New landscaping within main HNRFI site
  -  Well Being Zone
  -  Existing surrounding landscaping and farmland
  -  Existing woodland
  -  Existing alignment of public footpaths and bridleways (orange)
  -  Proposed alignment of public footpaths and bridleways (blue)
  -  Proposed alignment of pedestrian footpath / cycleway link (purple)

no.	date	revision	by

**aja architects**  
 aja architects llp  
 1170 Elliott Court  
 Harcourt Avenue  
 Coventry Business Park  
 COVENTRY CV5 6UB  
 E: aja@aja-architects.com  
 W: www.aja-architects.com  
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T: 024 7625 3200  
 F: 024 7625 3210

**TRITAX SYMMETRY**  
 A TRITAX BIG BOX COMPANY

project

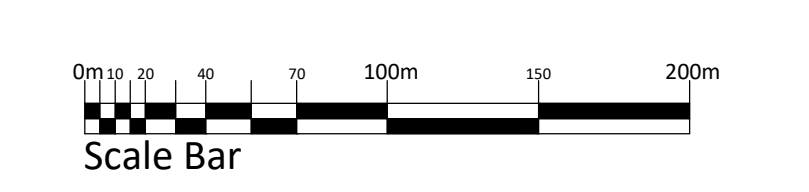
**HINKLEY NATIONAL RAIL FREIGHT INTERCHANGE**

drawing

Illustrative Masterplan

scale 1:2500 @ A0 drawn mjl  
 checked mjl date July 2022

Regulation no.5(2)(o)  
 5905 - 301



**Schedule of Accommodation**  
 All areas are gross internal

Unit	Distribution	Offices	Total	Car Parking	Lorry Parking	Height
01	61,435 sq.m.	2,787 sq.m.	64,222 sq.m.	534 no. spaces	114 no. spaces	Up to 22m
02	25,316 sq.m.	1,208 sq.m.	26,524 sq.m.	221 no. spaces	45 no. spaces	Up to 22m
03	25,548 sq.m.	1,115 sq.m.	26,663 sq.m.	222 no. spaces	53 no. spaces	Up to 22m
04	44,825 sq.m.	2,090 sq.m.	46,915 sq.m.	391 no. spaces	63 no. spaces	Up to 22m
05	32,702 sq.m.	1,672 sq.m.	34,374 sq.m.	286 no. spaces	51 no. spaces	Up to 22m
06	130,992 sq.m.	4,645 sq.m.	135,637 sq.m.	1130 no. spaces	191 no. spaces	Up to 28m
07	95,225 sq.m.	2,369 sq.m.	97,594 sq.m.	813 no. spaces	76 no. spaces	Up to 22m
08	76,551 sq.m.	2,369 sq.m.	78,920 sq.m.	658 no. spaces	63 no. spaces	Up to 28m
09	128,948 sq.m.	3,252 sq.m.	132,200 sq.m.	1102 no. spaces	180 no. spaces	Up to 25m
<b>Total</b>			<b>643,049 sq.m.</b>	<b>5,357 no. spaces</b>	<b>836 no. spaces</b>	
Railport			465 sq.m.	99 no. spaces		
Lorry Park & Drivers Welfare			465 sq.m.	11 no. spaces	104 no. spaces	
Amenity & security Offices			465 sq.m.	18 no. spaces		
<b>Total Development</b>			<b>644,444 sq.m.</b>	<b>5,485 no. spaces</b>	<b>940 no. spaces</b>	

M69 - J2



## APPENDICES

### Appendix 2: Topographical Survey



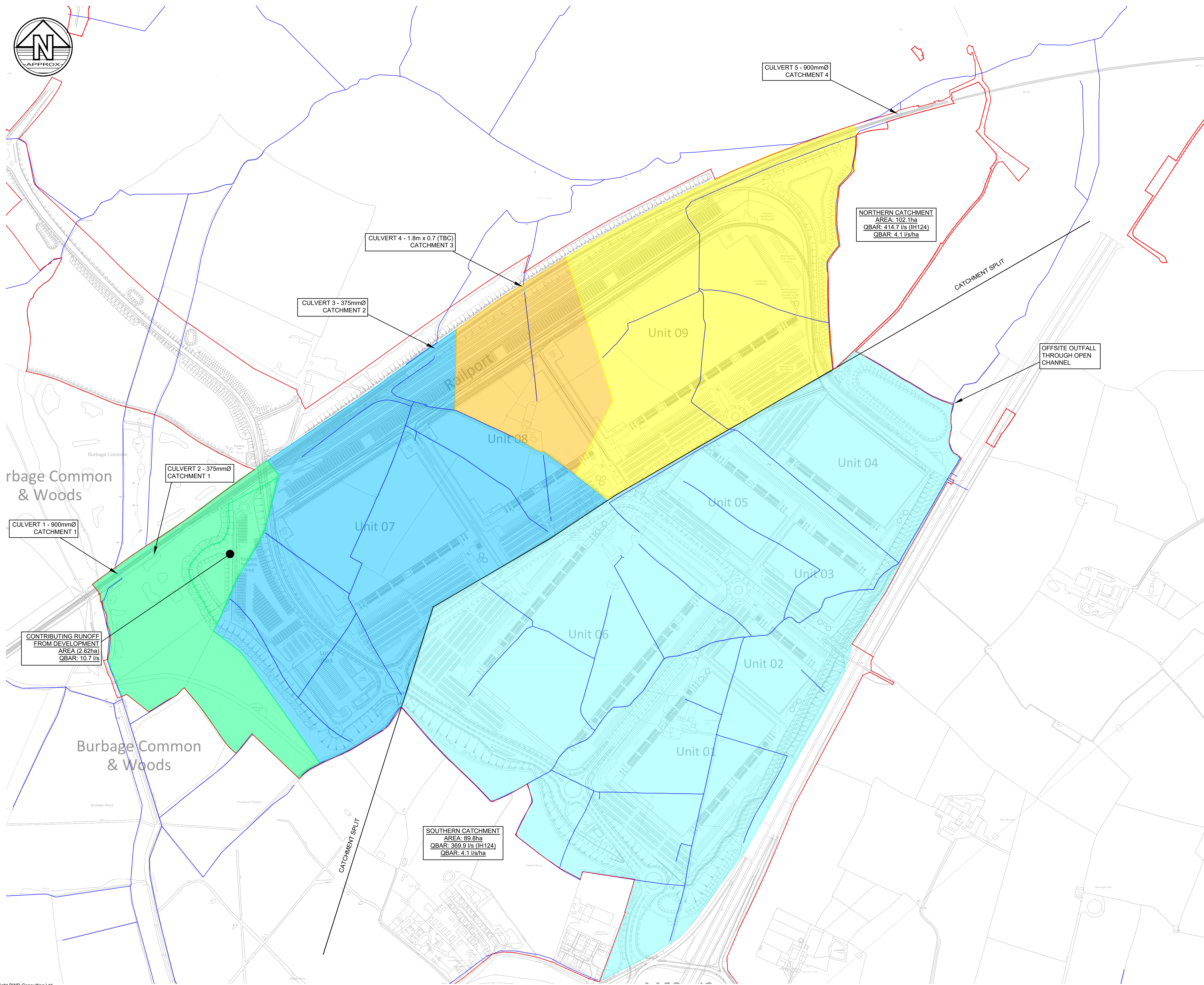




## APPENDICES

### Appendix 3: Existing Catchment Plan





- Notes**
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
  - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer immediately.
  - Greenfield runoff calculations based on the IH124 methodology. Rates outlined within the summary table outline the QBAR rate for the corresponding catchment.

- Legend**
- APPLICATION BOUNDARY
  - APPROXIMATE LINE OF EXISTING DITCHES / WATERCOURSES

CATCHMENT SUMMARY		
REFERENCE	CONTRIBUTING AREA (ha)	DISCHARGE RATE (l/s)
1	15.8	64.1
2	41.4	168.1
3	11.3	46.1
4	33.6	136.4
5	89.8	369.9

NORTHERN CATCHMENT  
 AREA: 102.1ha  
 QBAR: 414.7 l/s (IH124)  
 QBAR: 4.1 l/s/ha

CULVERT 4 - 1.8m x 0.7 (TBC)  
 CATCHMENT 3

CULVERT 3 - 375mmØ  
 CATCHMENT 2

CULVERT 2 - 375mmØ  
 CATCHMENT 1

CULVERT 1 - 900mmØ  
 CATCHMENT 1

CONTRIBUTING RUNOFF FROM DEVELOPMENT AREA (2.62ha)  
 QBAR: 10.7 l/s

SOUTHERN CATCHMENT  
 AREA: 89.8ha  
 QBAR: 369.9 l/s (IH124)  
 QBAR: 4.1 l/s/ha

Rev	Date	Details of issue / revision	Drw	Rev
P04	05.09.22	Updated to latest site layout	RJ	CD
P03	14.12.21	Updated DCO boundary	RJ	CD
P02	01.10.21	Updated to latest masterplan	RJ	CD
P01	25.05.21	Preliminary Issue	RJ	CD

**Issues & Revisions**

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

Client  
**TRITAX SYMMETRY**

Project Title  
**HINCKLEY RAIL FREIGHT INTERCHANGE**

Drawing Title  
**EXISTING CATCHMENT PLAN**

Drawn:	RJ	Reviewed:	CD
BWB Ref:	NTT 2814	Date:	25.05.21
Scale:	A1: 1:4000		

Drawing Status  
**PRELIMINARY**

Project - Originator - Zone - Level - Type - Role - Number    Status    Rev  
**HRF-BWB-EWE-ZZ-DR-CD-00501    S2    P04**



## APPENDICES

### Appendix 4: Severn Trent Water Asset Records

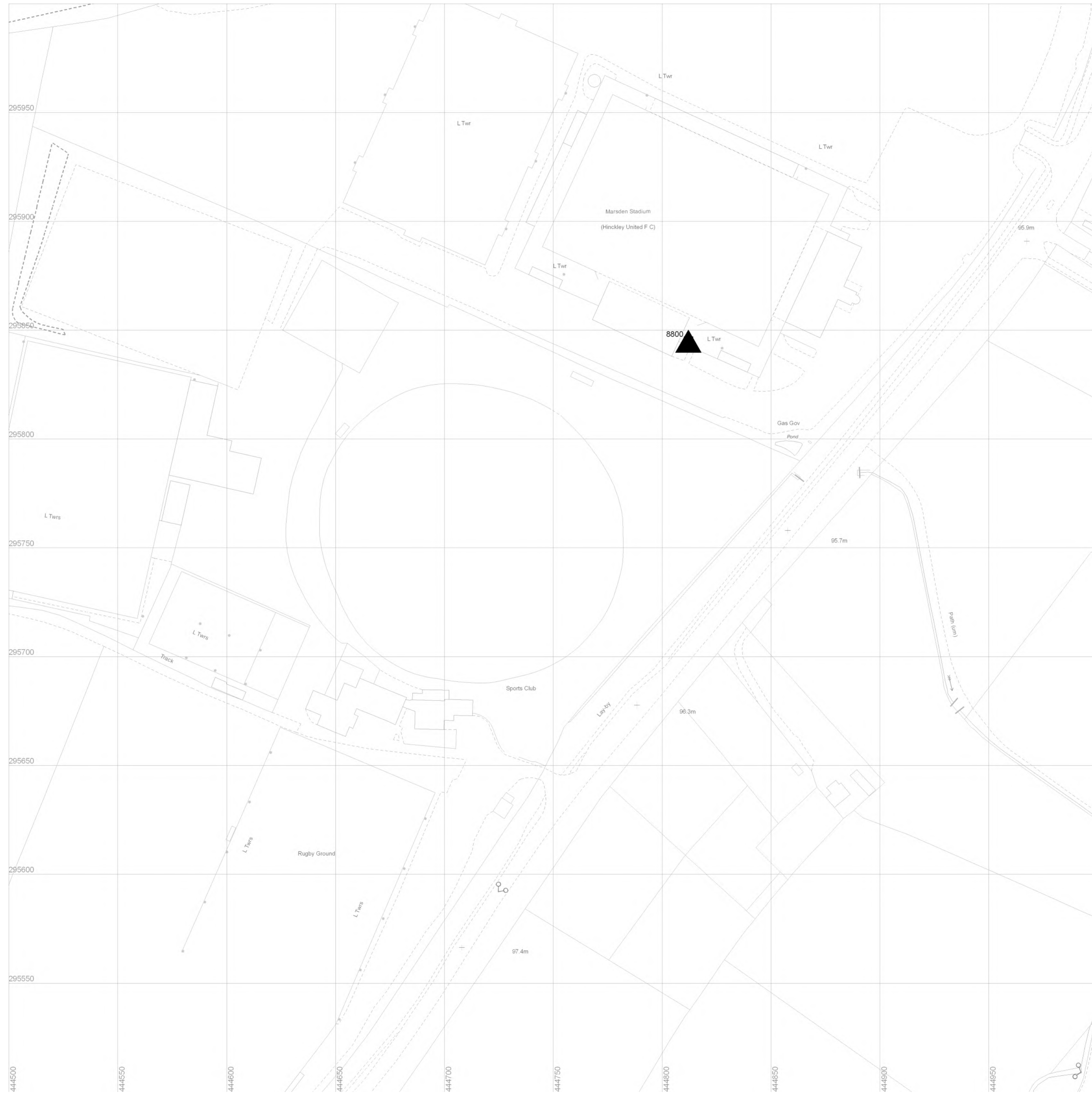


SP4496SE

SP4395NW

SP4495NW

SP4495SE



- ✕✕✕✕ Abandoned Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Public Combined Gravity Sewer
- Public Foul Gravity Sewer
- Public Surface Water Gravity Sewer
- Trunk Combined Gravity Sewer
- Trunk Foul Use Gravity Sewer
- Trunk Surface Water Gravity Sewer
- Combined Use Pressurised Sewer
- Foul Use Pressurised Sewer
- Surface Water Pressurised Sewer
- Highway Drain
- Combined Lateral Drain (SS)
- Foul Lateral Drain (SS)
- Surface Water Lateral Drain (SS)

- Cable, Earthing
- > Cable Junction
- Cable, Optical Fibre/Instrumentation
- Cable, Low Voltage
- Cable, High Voltage
- Cable, Other
- [B] Housing, Building
- [K] Housing, Kiosk
- [US] Disposal Site
- [STW] Sewage Treatment Works
- Housing, Other
- Pipe Support Structure
- ▲ Sewage Pumping Facility
- ⊠ Sewer Facility Connection Inlet / Outlet

- Blind Shaft
- Combined Use Manhole
- Flushing Chamber
- Foul Use Manhole
- Grease Trap
- + Head Node
- Hydrobrake
- Lamphole
- Outfall
- Overflow
- ≡ Penstock
- ⊙ Petrol Interceptor
- ★ Sewer Blockage
- ☆ Sewer Collapse
- Sewer Chemical Injection Point
- Sewer Junction
- ◆ Sewerage Air Valve
- Sewerage Hatch Box Point
- Sewerage Isolation Valve
- ⊙ Soakaway
- Surface Water Manhole
- Vent Column
- Waste Water Storage
- Culverted Watercourse
- Pre-1937 Properties

**MATERIALS**

AC	- ASBESTOS CEMENT
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	- CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRC	- GLASS REINFORCED CONCRETE
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHYLENE
PF	- PITCH
PP	- POLYPROPYLENE
PSC	- PLASTIC STEEL COMPOSITE
PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
XXX	- OTHER

*All Private Sewers are shown in magenta  
All section 104 sewers are shown in green  
All Sewers that have been transferred to Severn Trent Water after the 1<sup>st</sup> October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange*

**CATEGORIES**

W	- WEIR
C	- CASCADE
DB	- DAMBOARD
SE	- SIDE ENTRY
FV	- FLAP VALVE
BD	- BACK DROP
S	- SIPHON
HD	- HIGHWAY DRAIN
S104	- SECTION 104

**SHAPE**

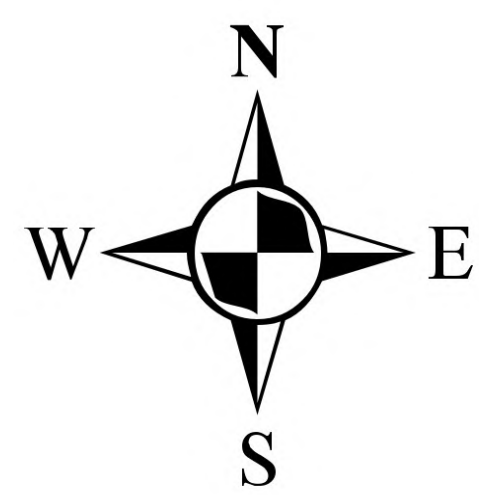
C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

**TABULAR KEY**

- Sewer pipe data refers to downstream sewer pipe.
- Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.
- Gradient is stated a 1 in...

**PURPOSE**

C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER



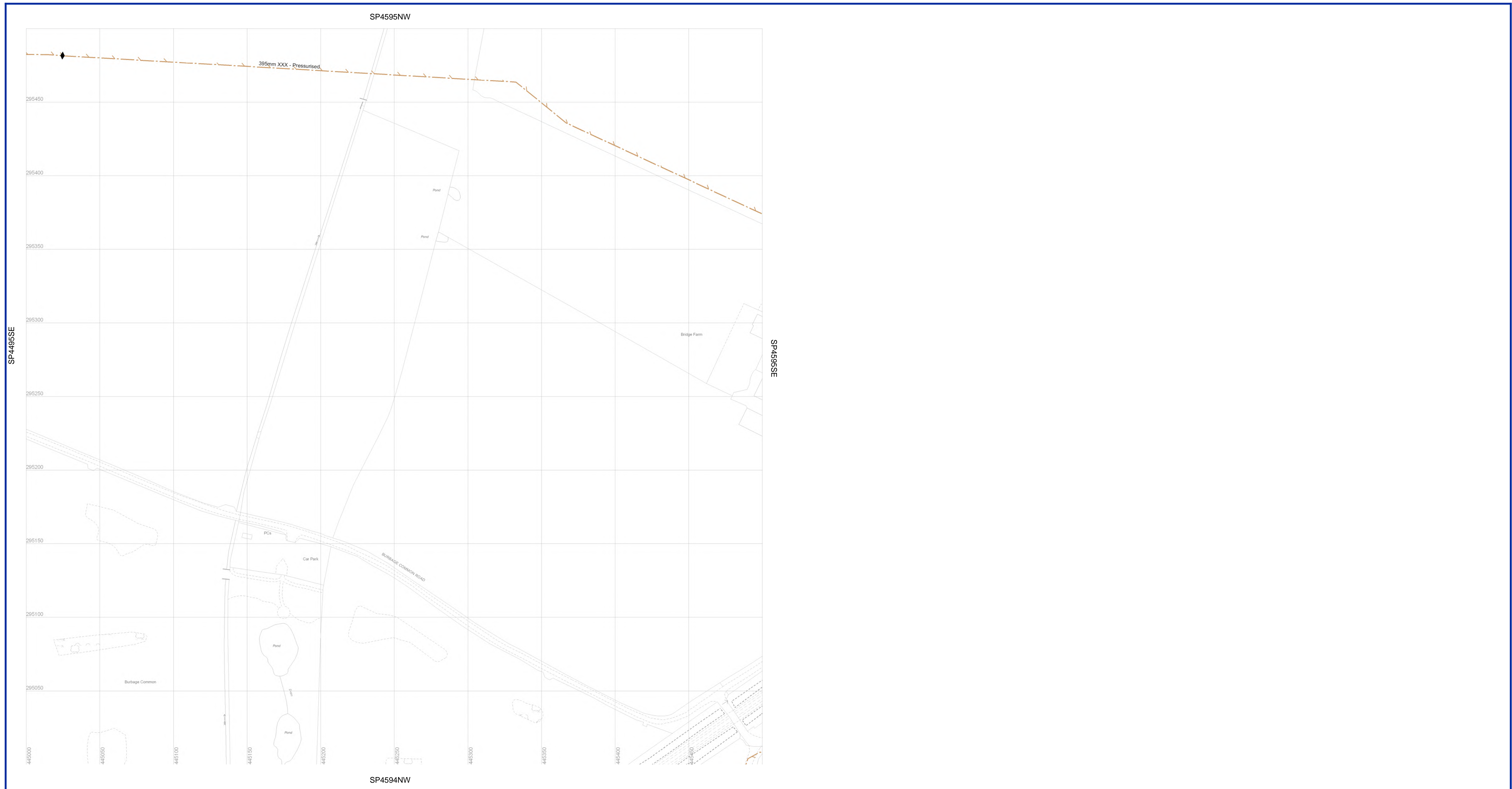
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Asset Data Management  
PO Box 5344  
Coventry  
CV3 9FT  
Telephone: 0845 601 6616

**SEWER RECORD (TABULAR)**

O/S Map scale: 1:1250  
Date of issue: 04.06.19  
Sheet No. 1 of 1  
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O / S Tile reference: SP4495NE

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3. On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012 (date to be confirmed). Private pumping stations, which form part of these sewers or lateral drains, will transfer to the ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets.  
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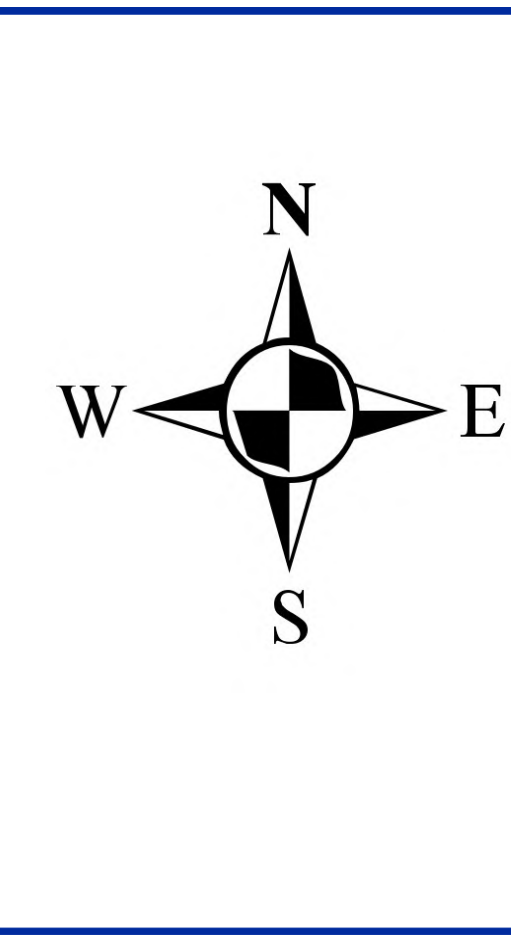
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	Private Combined Gravity Sewer		Combined Use Manhole
	Private Foul Gravity Sewer		Flushing Chamber
	Private Surface Water Gravity Sewer		Foul Use Manhole
	Public Combined Gravity Sewer		Grease Trap
	Public Foul Gravity Sewer		Head Node
	Public Surface Water Gravity Sewer		Hydrobrake
	Trunk Combined Gravity Sewer		Lamphole
	Trunk Foul Use Gravity Sewer		Outfall
	Trunk Surface Water Gravity Sewer		Overflow
	Combined Use Pressurised Sewer		Penstock
	Foul Use Pressurised Sewer		Petrol Interceptor
	Surface Water Pressurised Sewer		Sewer Blockage
	Highway Drain		Sewer Collapse
	Combined Lateral Drain (SS)		
	Foul Lateral Drain (SS)		
	Surface Water Lateral Drain (SS)		
	Cable, Earthing		
	Cable Junction		
	Cable, Optical Fibre/Instrumentation		
	Cable, Low Voltage		
	Cable, High Voltage		
	Cable, Other		
	Housing, Building		
	Housing, Kiosk		
	Disposal Site		
	Sewage Treatment Works		
	Housing, Other		
	Pipe Support Structure		
	Sewage Pumping Facility		
	Sewer Facility Connection Inlet / Outlet		
	Sewer Chemical Injection Point		
	Sewer Junction		
	Sewerage Air Valve		
	Sewerage Hatch Box Point		
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	Surface Water Manhole		
	Vent Column		
	Waste Water Storage		
	Culverted Watercourse		
	Pre-1937 Properties		


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FV	- FLAP VALVE
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PURPOSE	
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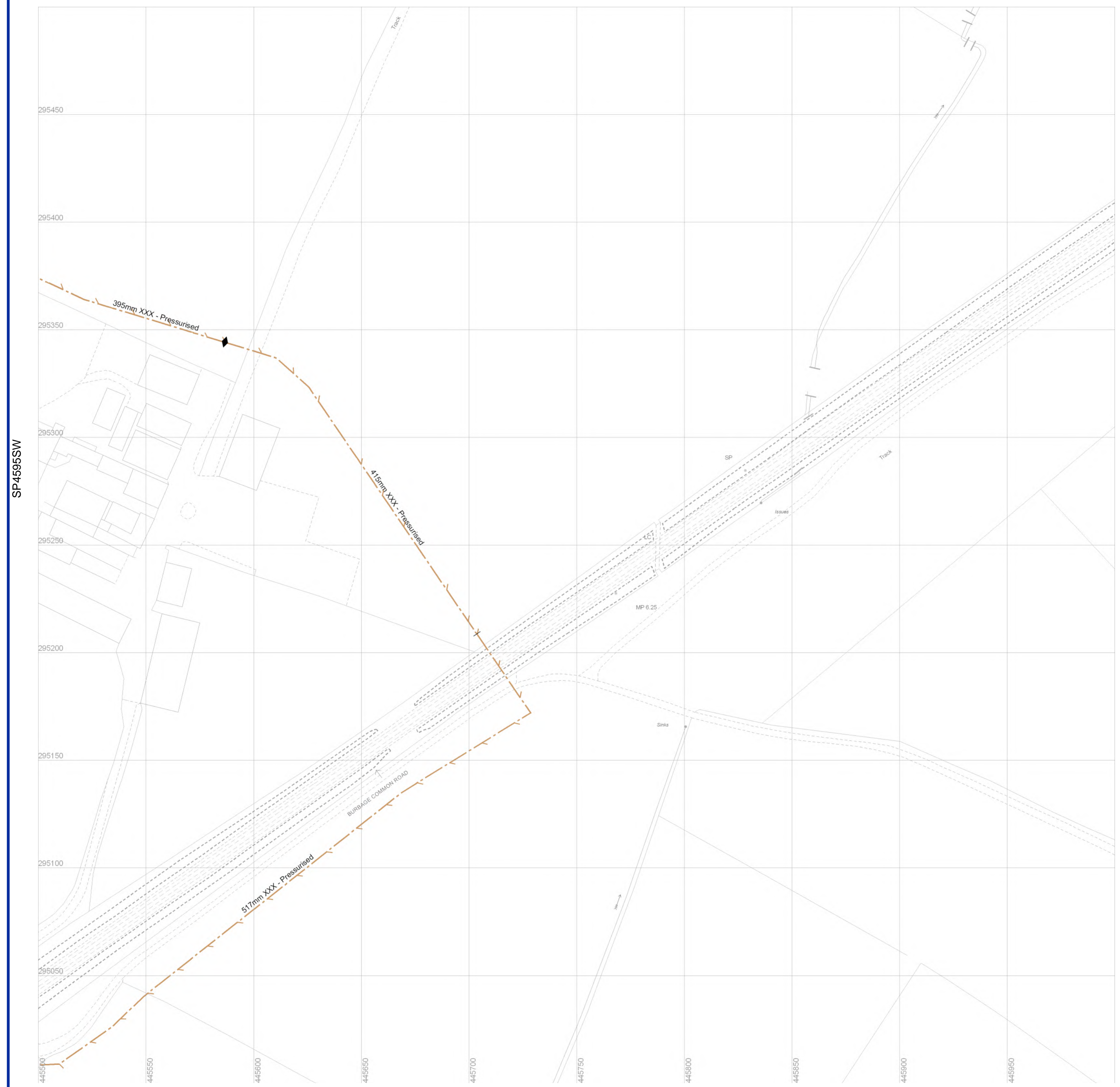
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SP4595SW

SP4695SW

SP4594NE

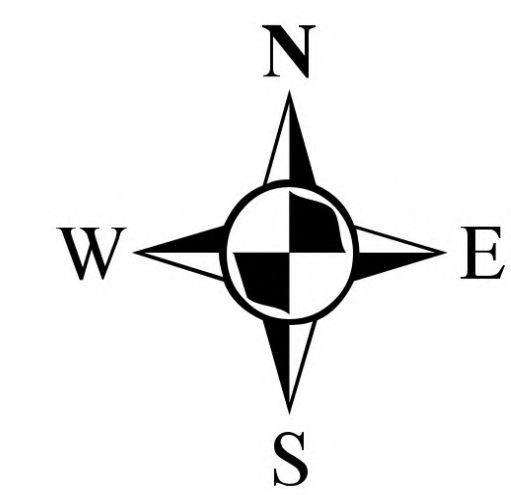
<ul style="list-style-type: none"> <li>Abandoned Sewer</li> <li>Private Combined Gravity Sewer</li> <li>Private Foul Gravity Sewer</li> <li>Private Surface Water Gravity Sewer</li> <li>Public Combined Gravity Sewer</li> <li>Public Foul Gravity Sewer</li> <li>Public Surface Water Gravity Sewer</li> <li>Trunk Combined Gravity Sewer</li> <li>Trunk Foul Use Gravity Sewer</li> <li>Trunk Surface Water Gravity Sewer</li> <li>Combined Use Pressurised Sewer</li> <li>Foul Use Pressurised Sewer</li> <li>Surface Water Pressurised Sewer</li> <li>Highway Drain</li> <li>Combined Lateral Drain (SS)</li> <li>Foul Lateral Drain (SS)</li> <li>Surface Water Lateral Drain (SS)</li> </ul>	<ul style="list-style-type: none"> <li>Cable, Earthing</li> <li>Cable Junction</li> <li>Cable, Optical Fibre/Instrumentation</li> <li>Cable, Low Voltage</li> <li>Cable, High Voltage</li> <li>Cable, Other</li> <li>Housing, Building</li> <li>Housing, Kiosk</li> <li>Disposal Site</li> <li>Sewage Treatment Works</li> <li>Housing, Other</li> <li>Pipe Support Structure</li> <li>Sewage Pumping Facility</li> <li>Sewer Facility Connection Inlet / Outlet</li> </ul>
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<ul style="list-style-type: none"> <li>Blind Shaft</li> <li>Combined Use Manhole</li> <li>Flushing Chamber</li> <li>Foul Use Manhole</li> <li>Grease Trap</li> <li>Head Node</li> <li>Hydrobrake</li> <li>Lamphole</li> <li>Outfall</li> <li>Overflow</li> <li>Penstock</li> <li>Petrol Interceptor</li> <li>Sewer Blockage</li> <li>Sewer Collapse</li> </ul>	<ul style="list-style-type: none"> <li>Sewer Chemical Injection Point</li> <li>Sewer Junction</li> <li>Sewerage Air Valve</li> <li>Sewerage Hatch Box Point</li> <li>Sewerage Isolation Valve</li> <li>Soakaway</li> <li>Surface Water Manhole</li> <li>Vent Column</li> <li>Waste Water Storage</li> <li>Culverted Watercourse</li> <li>Pre-1937 Properties</li> </ul>
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**Severn Trent Water Limited**  
Asset Data Management  
PO Box 5344  
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Telephone: 0845 601 6616

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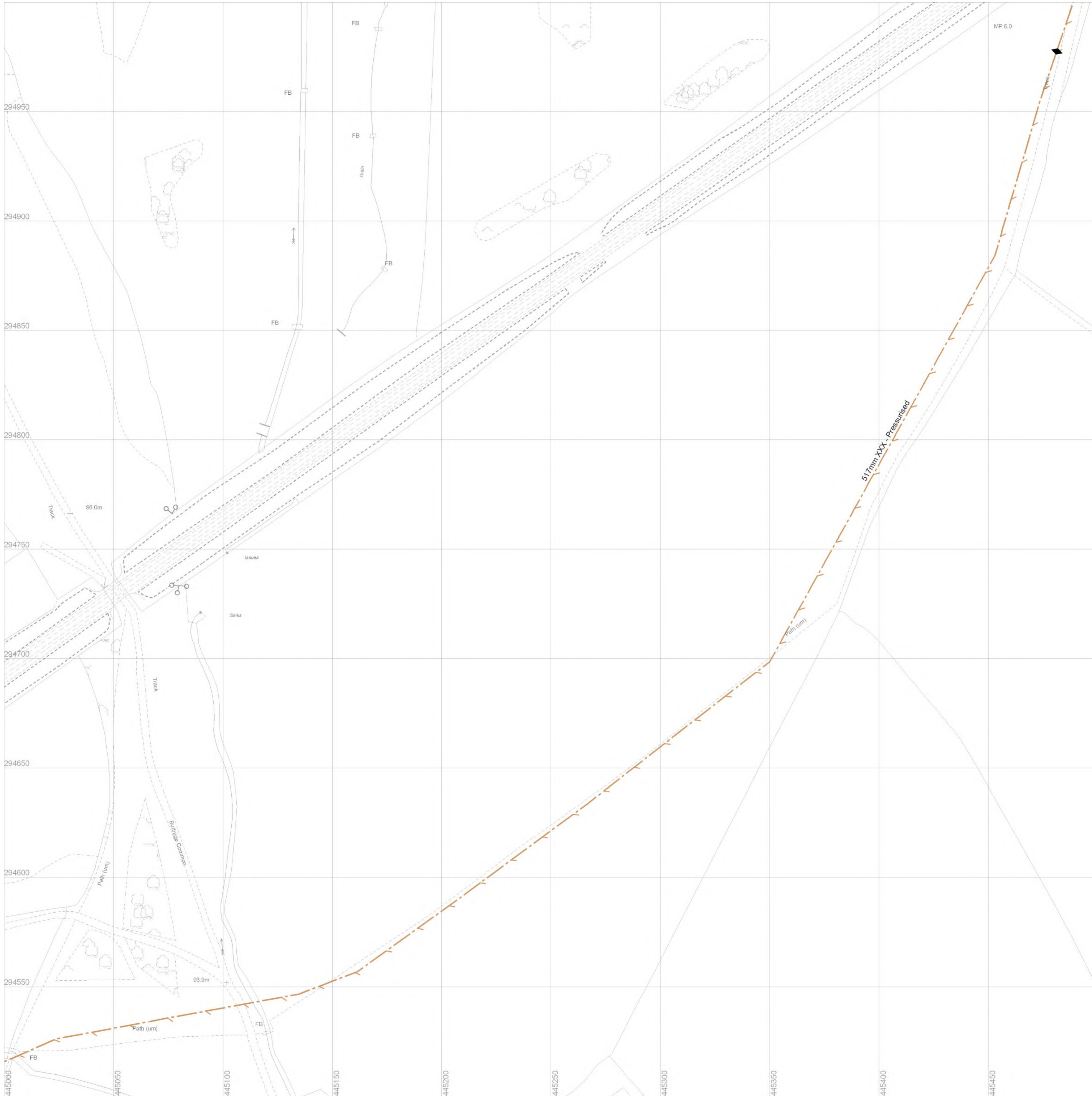


SP4595SW

SP4594NE

SP4594NE

SP4594SW



	Abandoned Sewer		Cable, Earthing		Blind Shaft
	Private Combined Gravity Sewer		Cable Junction		Combined Use Manhole
	Private Foul Gravity Sewer		Cable, Optical Fibre/Instrumentation		Flushing Chamber
	Private Surface Water Gravity Sewer		Cable, Low Voltage		Foul Use Manhole
	Public Combined Gravity Sewer		Cable, High Voltage		Grease Trap
	Public Foul Gravity Sewer		Cable, Other		Head Node
	Public Surface Water Gravity Sewer		Housing, Building		Hydrobrake
	Trunk Combined Gravity Sewer		Housing, Kiosk		Lamphole
	Trunk Foul Use Gravity Sewer		Disposal Site		Outfall
	Trunk Surface Water Gravity Sewer		Sewage Treatment Works		Overflow
	Combined Use Pressurised Sewer		Housing, Other		Penstock
	Foul Use Pressurised Sewer		Pipe Support Structure		Petrol Interceptor
	Surface Water Pressurised Sewer		Sewage Pumping Facility		Sewer Blockage
	Highway Drain		Sewer Facility Connection Inlet / Outlet		Sewer Collapse
	Combined Lateral Drain (SS)				
	Foul Lateral Drain (SS)				
	Surface Water Lateral Drain (SS)				

	Sewer Chemical Injection Point		Sewer Junction
	Sewerage Air Valve		Sewerage Hatch Box Point
	Sewerage Isolation Valve		Soakaway
	Surface Water Manhole		Vent Column
	Waste Water Storage		Pre-1937 Properties

**MATERIALS**

AC	- ASBESTOS CEMENT
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	- CONCRETE SEGMENTS (BOLTED)
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MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHYLENE
PF	- PITCH
PP	- POLYPROPYLENE
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PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
XXX	- OTHER

*All Private Sewers are shown in magenta  
All section 104 sewers are shown in green  
All Sewers that have been transferred to Severn Trent Water after the 1<sup>st</sup> October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange*

**CATEGORIES**

W	- WEIR
C	- CASCADE
DB	- DAMBOARD
SE	- SIDE ENTRY
FV	- FLAP VALVE
BD	- BACK DROP
S	- SIPHON
HD	- HIGHWAY DRAIN
S104	- SECTION 104

**SHAPE**

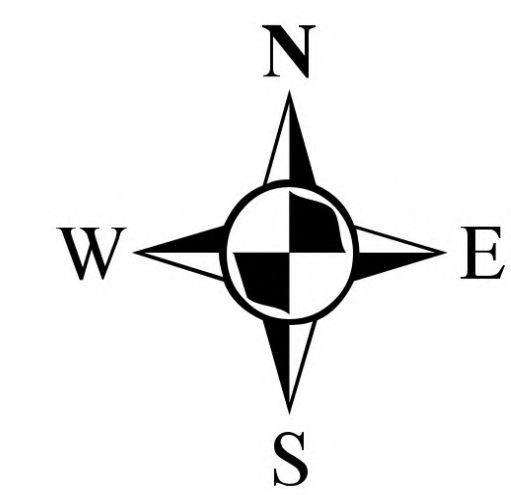
C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

**TABULAR KEY**

**A. Sewer pipe data refers to downstream sewer pipe.**  
**B. Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.**  
**C. Gradient is stated a 1 in...**

**PURPOSE**

C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER



Severn Trent Water Limited  
 Asset Data Management  
 PO Box 5344  
 Coventry  
 CV3 9FT  
 Telephone: 0845 601 6616

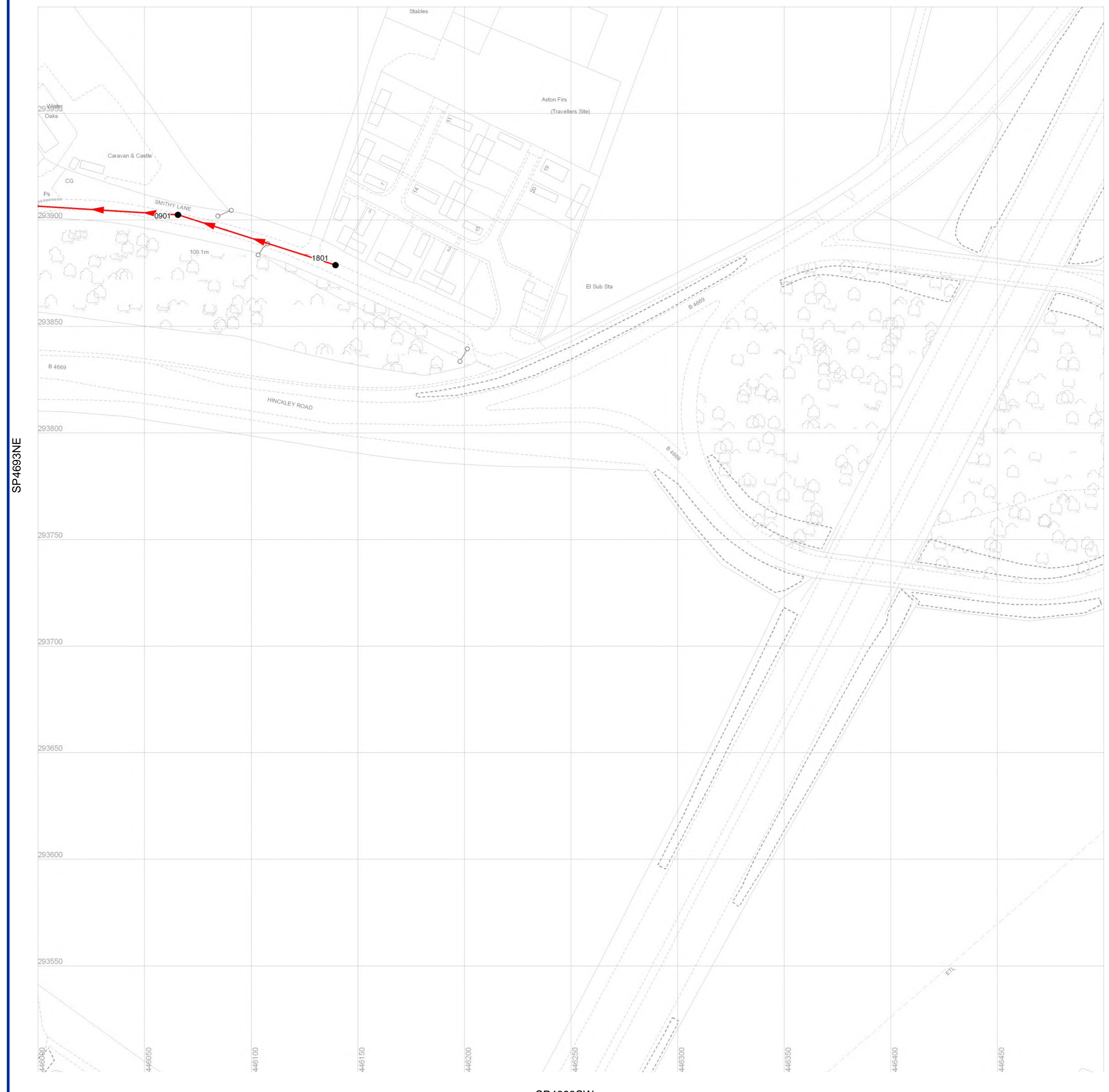
**SEWER RECORD (TABULAR)**

O/S Map scale: 1:1250  
 Date of issue: 04.06.19  
 Sheet No. 1 of 1  
 This map is centred upon:  
 O / S Tile reference: SP4594NW

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SP4694SW



REFERENCE	Sewer Pipe Data		PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
	COVER LEVEL	INV LEVEL							
SP4693901	nl	nl	105.97	C	nl	nl	nl	0.00	nl
SP46931801	nl	nl	nl	C	nl	nl	nl	0.00	nl

<ul style="list-style-type: none"> <li>Abandoned Sewer</li> <li>Private Combined Gravity Sewer</li> <li>Private Foul Gravity Sewer</li> <li>Private Surface Water Gravity Sewer</li> <li>Public Combined Gravity Sewer</li> <li>Public Foul Gravity Sewer</li> <li>Public Surface Water Gravity Sewer</li> <li>Trunk Combined Gravity Sewer</li> <li>Trunk Foul Use Gravity Sewer</li> <li>Trunk Surface Water Gravity Sewer</li> <li>Combined Use Pressurised Sewer</li> <li>Foul Use Pressurised Sewer</li> <li>Surface Water Pressurised Sewer</li> <li>Highway Drain</li> <li>Combined Lateral Drain (SS)</li> <li>Foul Lateral Drain (SS)</li> <li>Surface Water Lateral Drain (SS)</li> </ul>	<ul style="list-style-type: none"> <li>Cable, Earthing</li> <li>Cable Junction</li> <li>Cable, Optical Fibre/Instrumentation</li> <li>Cable, Low Voltage</li> <li>Cable, High Voltage</li> <li>Cable, Other</li> <li>Housing, Building</li> <li>Housing, Kiosk</li> <li>Disposal Site</li> <li>Sewage Treatment Works</li> <li>Housing, Other</li> <li>Pipe Support Structure</li> <li>Sewage Pumping Facility</li> <li>Sewer Facility Connection Inlet / Outlet</li> </ul>	<ul style="list-style-type: none"> <li>Blind Shaft</li> <li>Combined Use Manhole</li> <li>Flushing Chamber</li> <li>Foul Use Manhole</li> <li>Grease Trap</li> <li>Head Node</li> <li>Hydrobrake</li> <li>Lamphole</li> <li>Outfall</li> <li>Overflow</li> <li>Penstock</li> <li>Petrol Interceptor</li> <li>Sewer Blockage</li> <li>Sewer Collapse</li> </ul>	<ul style="list-style-type: none"> <li>Sewer Chemical Injection Point</li> <li>Sewer Junction</li> <li>Sewerage Air Valve</li> <li>Sewerage Hatch Box Point</li> <li>Sewerage Isolation Valve</li> <li>Soakaway</li> <li>Surface Water Manhole</li> <li>Vent Column</li> <li>Waste Water Storage</li> <li>Culverted Watercourse</li> <li>Pre-1937 Properties</li> </ul>
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**MATERIALS**

AC	- ASBESTOS CEMENT
BR	- BRICK
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SI	- SPUN (GREY) IRON
XXX	- OTHER

**CATEGORIES**

W	- WEIR
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BD	- BACK DROP
S	- SIPHON
HD	- HIGHWAY DRAIN
S104	- SECTION 104

**SHAPE**

C	- CIRCULAR
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S	- SQUARE
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**PURPOSE**

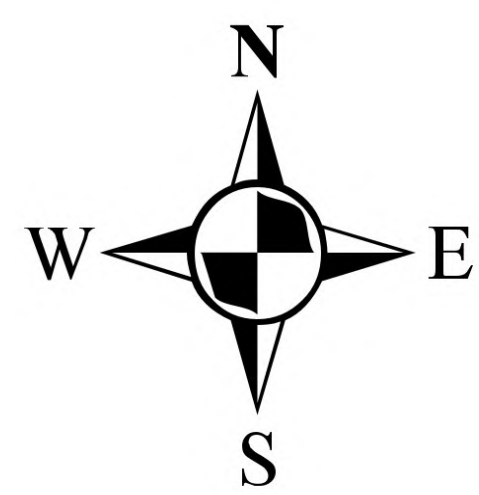
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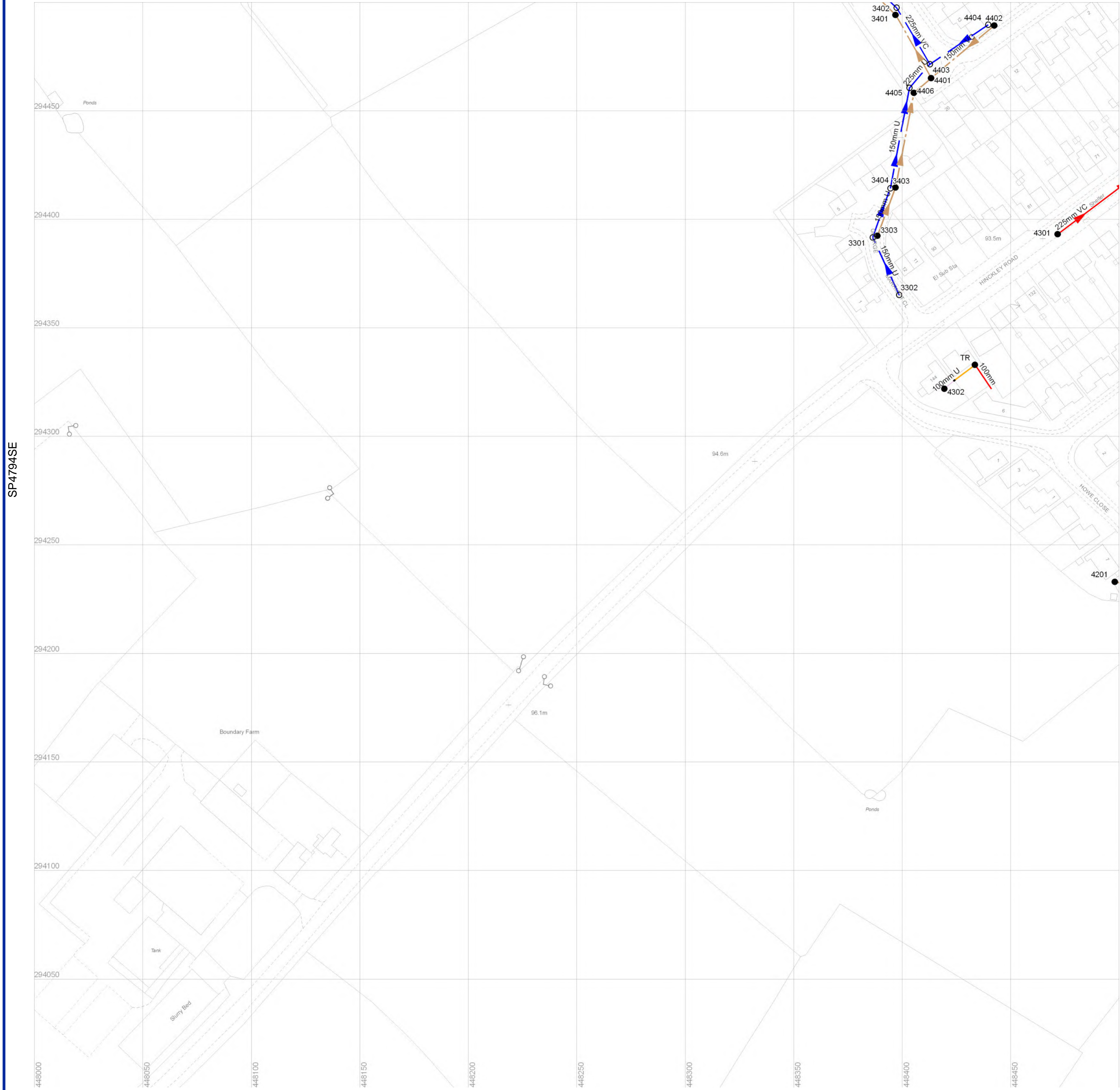
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	<p>Severn Trent Water Limited Asset Data Management PO Box 5344 Coventry CV3 9FT Telephone: 0845 601 6616</p>
<h2>SEWER RECORD (TABULAR)</h2>	
O/S Map scale: 1:1250	This map is centred upon: O / S Tile reference: SP4693NW
Date of issue: 04.06.19	
Sheet No. 1 of 1	
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SP4894NW



REFERENCE	Sewer Pipe Data		PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAD
	COVER LEVEL	INV LEVEL							
SP4894301	92.96	91.43	S	U	C	150	nil	57.71	nil
SP4894302	93.47	91.92	S	U	C	150	nil	59.92	nil
SP4894303	92.99	90.98	F	U	C	150	nil	62.96	nil
SP4894304	91.22	88.66	F	VC	C	225	nil	115.87	1979
SP4894305	91.13	88.87	S	VC	C	225	nil	257.64	1979
SP4894306	92.61	91.01	S	U	C	150	nil	26.91	nil
SP4894307	92.50	90.53	F	U	C	150	nil	4494.00	nil
SP4894308	93.09	90.99	F	VC	C	150	nil	70.09	1979
SP4894309	93.52	91.20	C	VC	C	225	nil	94.49	1914
SP4894310	nil	nil	C	U	C	100	nil	0.00	nil
SP4894401	91.57	88.79	F	VC	C	225	nil	278.83	1979
SP4894402	91.36	89.00	F	VC	C	150	nil	190.40	1979
SP4894403	91.52	89.13	S	VC	C	225	nil	127.21	1979
SP4894404	91.34	89.35	S	VC	C	150	nil	158.52	1979
SP4894405	91.59	89.09	nil	S	U	C	225	0.15	nil
SP4894406	91.60	89.52	F	U	C	150	nil	12.75	nil
nil	nil	nil	C	nil	nil	nil	nil	0.00	nil

SP4894SE  
SP4893NW

- Abandoned Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Public Combined Gravity Sewer
- Public Foul Gravity Sewer
- Public Surface Water Gravity Sewer
- Trunk Combined Gravity Sewer
- Trunk Foul Use Gravity Sewer
- Trunk Surface Water Gravity Sewer
- Combined Use Pressurised Sewer
- Foul Use Pressurised Sewer
- Surface Water Pressurised Sewer
- Highway Drain
- Combined Lateral Drain (SS)
- Foul Lateral Drain (SS)
- Surface Water Lateral Drain (SS)
- Cable, Earthing
- Cable Junction
- Cable, Optical Fibre/Instrumentation
- Cable, Low Voltage
- Cable, High Voltage
- Cable, Other
- Housing, Building
- Housing, Kiosk
- Disposal Site
- Sewage Treatment Works
- Housing, Other
- Pipe Support Structure
- Sewage Pumping Facility
- Sewer Facility Connection Inlet / Outlet
- Blind Shaft
- Combined Use Manhole
- Flushing Chamber
- Foul Use Manhole
- Grease Trap
- Head Node
- Hydrobrake
- Lamphole
- Outfall
- Overflow
- Penstock
- Petrol Interceptor
- Sewer Blockage
- Sewer Collapse
- Sewer Chemical Injection Point
- Sewer Junction
- Sewerage Air Valve
- Sewerage Hatch Box Point
- Sewerage Isolation Valve
- Soakaway
- Surface Water Manhole
- Vent Column
- Waste Water Storage
- Culverted Watercourse
- Pre-1937 Properties

- Sewer Chemical Injection Point
- Sewer Junction
- Sewerage Air Valve
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**SHAPE**

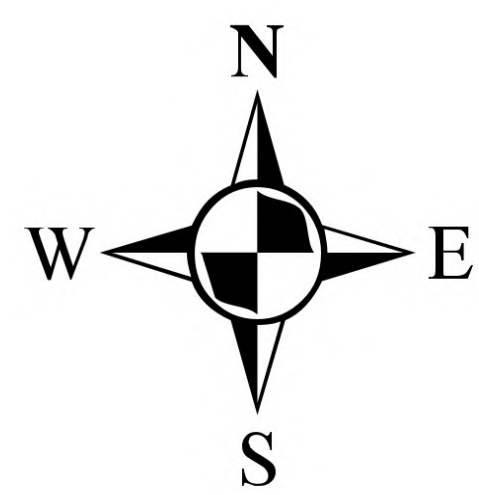
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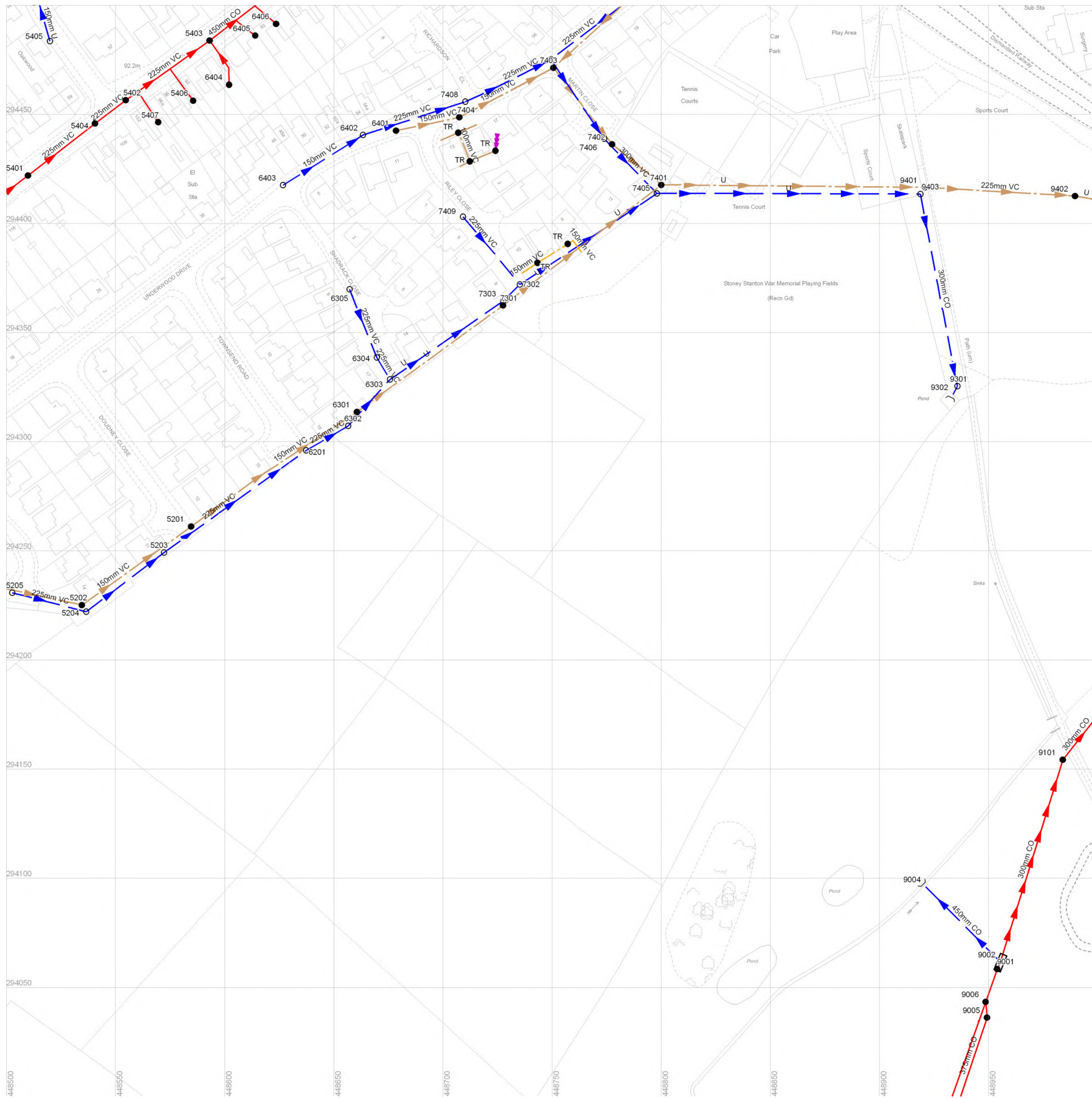
### SEWER RECORD (TABULAR)

O/S Map scale: 1:1250  
Date of issue: 04.06.19  
Sheet No. 1 of 1  
This map is centred upon:  
O / S Tile reference: SP4894SW

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SP4894NE



REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAD
SP4894201	91.17	89.88	ni	F	VC	C	150	ni	0.00	1979
SP4894202	92.56	90.42	89.92	F	VC	C	150	ni	123.22	1979
SP4894203	91.16	90.10	89.52	S	VC	C	225	ni	139.69	1979
SP4894204	92.59	90.77	90.13	S	VC	C	225	ni	69.69	1979
SP4894205	93.00	91.00	90.82	S	VC	C	225	ni	195.39	1979
SP4894401	92.96	90.66	90.33	C	VC	C	ni	ni	117.00	1914
SP4894402	92.45	90.45	90.26	C	VC	C	ni	ni	248.42	1914
SP4894403	92.18	90.26	89.93	C	CO	C	ni	ni	145.76	1914
SP4894404	92.48	90.30	90.47	C	VC	C	ni	ni	0.00	1914
SP4894405	92.00	90.43	89.45	S	U	C	150	ni	23.27	2003
SP4894406	ni	ni	ni	C	ni	ni	ni	ni	0.00	ni
SP4894507	ni	ni	ni	C	ni	ni	ni	ni	0.00	ni
SP4894501	91.11	89.49	ni	S	VC	C	225	ni	0.00	1979
SP4894501	ni	ni	ni	F	U	U	ni	ni	0.00	2003
SP4894502	ni	ni	ni	S	ni	ni	ni	ni	0.00	ni
SP4894503	ni	ni	87.15	S	U	U	ni	ni	0.00	1979
SP4894504	90.76	88.64	ni	S	VC	C	225	ni	0.00	2003
SP4894505	90.55	88.87	88.68	S	VC	C	225	ni	178.95	2003
SP4894601	90.29	88.06	87.64	F	VC	C	150	ni	71.02	2003
SP4894602	90.51	88.74	87.82	S	VC	C	225	ni	53.97	2003
SP4894603	91.37	89.82	88.82	S	VC	C	150	ni	42.72	2003
SP4894604	ni	ni	ni	C	ni	ni	ni	ni	0.00	ni
SP4894605	ni	ni	ni	C	ni	ni	ni	ni	0.00	ni
SP4894606	ni	ni	ni	C	ni	ni	ni	ni	0.00	ni
SP4894701	ni	ni	ni	F	U	U	ni	ni	0.00	1979
SP4894702	ni	ni	ni	S	U	U	ni	ni	0.00	1979
SP4894703	89.40	87.10	ni	S	VC	C	300	ni	0.00	1979
SP4894701	ni	ni	84.42	F	U	U	ni	ni	0.00	1979
SP4894702	88.56	86.15	ni	F	VC	C	150	ni	0.00	1979
SP4894703	89.24	86.68	86.16	F	VC	C	150	ni	85.00	1979
SP4894704	89.87	87.60	86.72	F	VC	C	150	ni	54.89	1979
SP4894705	ni	ni	84.05	S	U	U	ni	ni	0.00	1979
SP4894706	88.58	86.55	ni	S	VC	C	300	ni	0.00	1979
SP4894707	89.27	87.18	86.57	S	VC	C	300	ni	73.20	1979
SP4894708	89.89	87.80	87.23	S	VC	C	225	ni	76.11	1979
SP4894709	89.45	87.74	ni	S	VC	C	225	ni	0.00	1979
SP48948001	83.57	81.92	81.87	C	CO	C	450	ni	69.00	1979
SP48949005	83.98	82.20	81.95	C	VC	C	375	ni	30.08	1979
SP48949006	83.87	81.95	81.92	C	CO	C	450	ni	534.67	1979
SP48949101	83.20	81.39	80.63	C	CO	C	300	ni	133.78	1979
SP48949301	83.34	82.11	82.30	S	CO	C	300	ni	0.00	ni
SP48949401	86.03	84.36	ni	F	VC	C	225	ni	0.00	1979
SP48949402	ni	ni	82.03	F	U	U	ni	ni	0.00	1979
SP48949403	86.04	83.94	82.22	S	CO	C	300	ni	52.11	1979
ni	ni	ni	ni	F	VC	ni	ni	ni	0.00	ni
ni	ni	ni	ni	F	VC	ni	ni	ni	0.00	ni
ni	ni	ni	ni	F	VC	ni	ni	ni	0.00	ni

SP4994SW

SP4893NE

<ul style="list-style-type: none"> <li>✕✕✕ Abandoned Sewer</li> <li>Private Combined Gravity Sewer</li> <li>Private Foul Gravity Sewer</li> <li>Private Surface Water Gravity Sewer</li> <li>Public Combined Gravity Sewer</li> <li>Public Foul Gravity Sewer</li> <li>Public Surface Water Gravity Sewer</li> <li>Trunk Combined Gravity Sewer</li> <li>Trunk Foul Use Gravity Sewer</li> <li>Trunk Surface Water Gravity Sewer</li> <li>Combined Use Pressurised Sewer</li> <li>Foul Use Pressurised Sewer</li> <li>Surface Water Pressurised Sewer</li> <li>Highway Drain</li> <li>Combined Lateral Drain (SS)</li> <li>Foul Lateral Drain (SS)</li> <li>Surface Water Lateral Drain (SS)</li> </ul>	<ul style="list-style-type: none"> <li>○ Cable, Earthing</li> <li>&gt; Cable Junction</li> <li>--- Cable, Optical Fibre/Instrumentation</li> <li>--- Cable, Low Voltage</li> <li>--- Cable, High Voltage</li> <li>--- Cable, Other</li> <li>[B] Housing, Building</li> <li>[K] Housing, Kiosk</li> <li>[US] Disposal Site</li> <li>[STW] Sewage Treatment Works</li> <li>○ Housing, Other</li> <li>○ Pipe Support Structure</li> <li>▲ Sewage Pumping Facility</li> <li>⊠ Sewer Facility Connection Inlet / Outlet</li> </ul>	<ul style="list-style-type: none"> <li>■ Blind Shaft</li> <li>● Combined Use Manhole</li> <li>○ Flushing Chamber</li> <li>● Foul Use Manhole</li> <li>● Grease Trap</li> <li>+ Head Node</li> <li>— Hydrobrake</li> <li>○ Lamphole</li> <li>○ Outfall</li> <li>○ Overflow</li> <li>≡ Penstock</li> <li>○ Petrol Interceptor</li> <li>★ Sewer Blockage</li> <li>☆ Sewer Collapse</li> </ul>	<ul style="list-style-type: none"> <li>— Sewer Chemical Injection Point</li> <li>• Sewer Junction</li> <li>◆ Sewerage Air Valve</li> <li>■ Sewerage Hatch Box Point</li> <li>— Sewerage Isolation Valve</li> <li>⊕ Soakaway</li> <li>○ Surface Water Manhole</li> <li>■ Vent Column</li> <li>■ Waste Water Storage</li> <li>— Culverted Watercourse</li> <li>--- Pre-1937 Properties</li> </ul>
---	---	--	---

**MATERIALS**

AC	- ASBESTOS CEMENT
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**CATEGORIES**

W	- WEIR
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HD	- HIGHWAY DRAIN
S104	- SECTION 104

**SHAPE**

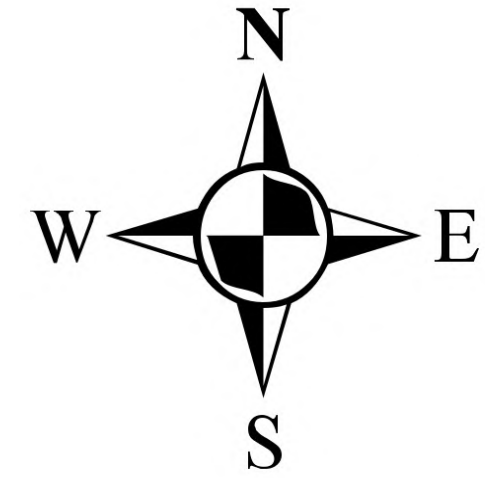
C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

**PURPOSE**

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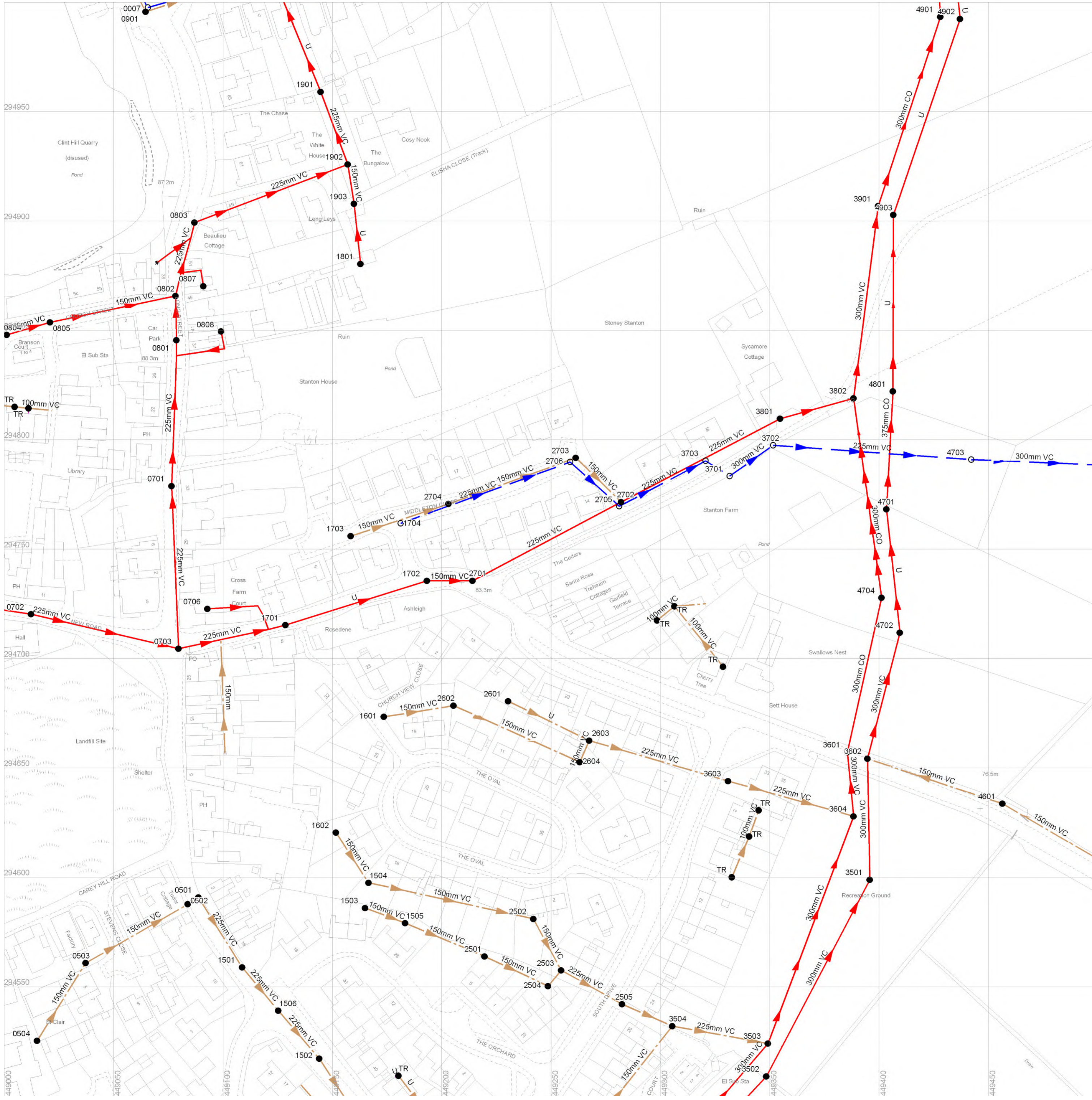
Severn Trent Water Limited  
Asset Data Management  
PO Box 5344  
Coventry  
CV3 9FT  
Telephone: 0845 601 6616

## SEWER RECORD (TABULAR)

O/S Map scale: 1:1250      This map is centred upon:  
Date of issue: 04.06.19      O / S Tile reference:  
Sheet No. 1 of 1      SP4894SE

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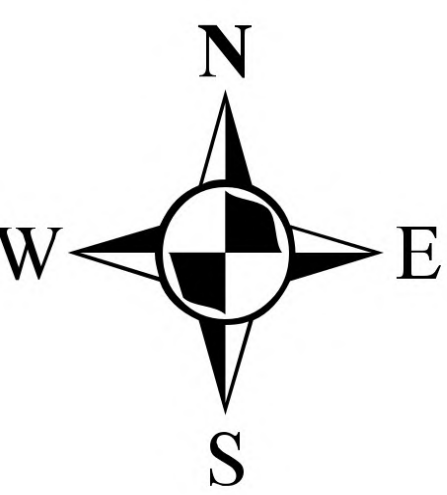
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SP49940007	82.21	75.76	75.44	S	nl	C	675	nil	315.50	nil
SP49940501	88.50	86.71	84.28	F	VC	C	225	nil	15.53	1979
SP49940502	88.67	87.37	86.74	F	VC	C	150	nil	9.25	1979
SP49940503	90.57	88.44	87.40	F	VC	C	150	nil	52.12	1979
SP49940504	90.44	89.33	88.45	F	VC	C	150	nil	47.94	1979
SP49940701	89.21	88.25	86.40	C	VC	C	225	nil	36.25	1979
SP49940702	92.67	90.53	88.44	C	VC	C	225	nil	32.96	1979
SP49940703	90.20	88.44	nil	C	VC	C	225	nil	0.00	1979
SP49940703	90.20	88.39	nil	C	VC	C	225	nil	0.00	1914
SP49940706	nil	nil	nil	nl	nl	nl	nil	nil	0.00	nil
SP49940801	88.24	86.36	86.10	C	VC	C	225	nil	77.00	1979
SP49940802	87.95	86.00	85.39	C	VC	C	225	nil	56.08	1979
SP49940803	87.31	85.32	82.04	C	VC	C	225	nil	22.77	1979
SP49940804	91.95	90.34	89.31	C	VC	C	150	nil	18.14	1979
SP49940805	91.98	89.30	86.12	C	VC	C	150	nil	18.63	1979
SP49940807	nil	nil	nil	C	nl	nl	nil	nil	0.00	nil
SP49940808	nil	nil	nil	C	nl	nl	nil	nil	0.00	nil
SP49940901	82.28	75.73	75.46	F	nl	C	375	nil	373.93	1979
SP49941501	86.07	84.24	82.97	F	VC	C	225	nil	19.56	1979
SP49941502	83.36	81.54	80.46	F	VC	C	225	nil	32.10	1979
SP49941503	85.99	84.50	83.57	F	VC	C	nil	nil	19.76	1979
SP49941504	85.59	84.21	80.33	F	VC	C	150	nil	20.27	1979
SP49941505	85.26	83.54	81.19	F	VC	C	nil	nil	16.99	1979
SP49941506	84.56	82.95	81.58	F	VC	C	225	nil	21.22	1979
SP49941601	85.84	85.01	83.04	F	VC	C	150	nil	16.44	1979
SP49941602	86.96	85.58	84.25	F	VC	C	150	nil	20.65	1979
SP49941701	87.17	nil	82.27	C	U	nl	nil	nil	0.00	1914
SP49941702	84.04	82.20	81.46	C	VC	C	150	nil	28.38	1979
SP49941703	86.13	84.51	82.42	F	VC	C	150	nil	22.69	2003
SP49941704	85.01	83.68	80.24	S	VC	C	225	nil	24.09	1979
SP49941801	nil	nil	82.52	C	U	nl	nil	nil	0.00	1979
SP49941901	nil	nil	78.63	C	U	nl	nil	nil	0.00	1979
SP49941902	83.80	82.02	81.03	C	VC	C	225	nil	0.00	1979
SP49941903	84.17	82.22	82.03	C	VC	C	150	nil	90.84	1979
SP49942501	82.84	81.18	79.53	F	VC	C	nil	nil	19.26	1979
SP49942502	81.58	80.28	79.31	F	VC	C	nil	nil	27.22	1979
SP49942503	80.42	79.22	77.63	F	VC	C	nil	nil	20.53	1979
SP49942504	80.98	79.49	79.38	F	VC	C	150	nil	71.00	nil
SP49942505	79.73	77.59	76.84	F	VC	C	nil	nil	34.05	1979
SP49942601	nil	nil	79.55	F	U	nl	nil	nil	0.00	1979
SP49942602	84.09	83.03	80.37	F	VC	C	150	nil	23.89	1979
SP49942603	81.14	79.55	77.01	F	VC	C	225	nil	26.56	1979
SP49942604	81.61	80.36	79.55	F	VC	C	150	nil	13.30	1979
SP49942701	83.33	81.44	78.88	C	VC	C	225	nil	30.40	1979
SP49942702	80.55	78.86	nil	C	VC	C	225	nil	0.00	1979
SP49942703	81.56	80.06	78.98	F	VC	C	150	nil	26.85	1979
SP49942704	84.10	82.40	80.11	F	VC	C	150	nil	27.35	1979
SP49942705	80.52	79.21	78.19	S	VC	C	225	nil	44.29	1979
SP49942706	81.54	80.23	79.31	S	VC	C	225	nil	33.40	1979
SP49943501	77.12	76.02	75.73	C	VC	C	300	nil	189.69	1979
SP49943502	77.36	76.37	76.04	C	VC	C	300	nil	309.09	1979
SP49943503	77.59	76.49	76.93	C	VC	C	300	nil	198.98	1979
SP49943504	78.43	76.80	76.57	F	VC	C	225	nil	188.04	1979
SP49943601	77.63	75.80	75.61	C	CO	C	300	nil	377.95	1979
SP49943602	77.36	75.72	nil	C	VC	C	300	nil	0.00	1979
SP49943603	78.86	77.00	76.12	F	VC	C	225	nil	67.27	1979
SP49943604	77.17	75.90	75.81	C	VC	C	300	nil	323.89	1979
SP49943701	78.68	77.73	77.05	S	VC	C	300	nil	35.90	1979
SP49943702	77.69	77.01	74.69	S	VC	C	225	nil	38.91	1979
SP49943703	78.85	78.16	77.91	S	VC	C	225	nil	52.16	nil
SP49943801	nil	nil	75.46	C	nl	nl	nil	nil	0.00	nil
SP49943802	77.02	75.29	75.13	C	VC	C	300	nil	554.25	1979
SP49943901	76.95	75.13	nil	C	CO	C	300	nil	0.00	1979
SP49944001	76.90	76.10	75.84	F	VC	C	150	nil	246.92	1979
SP49944101	76.71	75.42	nil	C	CO	C	395	nil	0.00	1979
SP49944202	nil	nil	75.43	C	U	nl	nil	nil	0.00	1979
SP49944303	75.53	74.66	74.35	S	VC	C	300	nil	213.13	1979
SP49944404	76.87	75.60	75.31	C	CO	C	300	nil	316.87	1979
SP49944801	nil	nil	nil	C	U	nl	nil	nil	0.00	1979
SP49944901	nil	nil	nil	C	CO	C	300	nil	0.00	1979
SP49944902	nil	nil	nil	C	U	nl	nil	nil	0.00	1979
SP49944903	nil	nil	nil	C	U	nl	nil	nil	0.00	1979
nl	nil	nil	nil	F	VC	nl	nil	nil	0.00	nil
nl	nil	nil	nil	F	U	nl	nil	nil	0.00	nil
nl	nil	nil	nil	F	VC	nl	nil	nil	0.00	nil
nl	nil	nil	nil	F	VC	nl	nil	nil	0.00	nil
nl	nil	nil	nil	F	VC	nl	nil	nil	0.00	nil
nl	nil	nil	nil	F	VC	nl	nil	nil	0.00	nil

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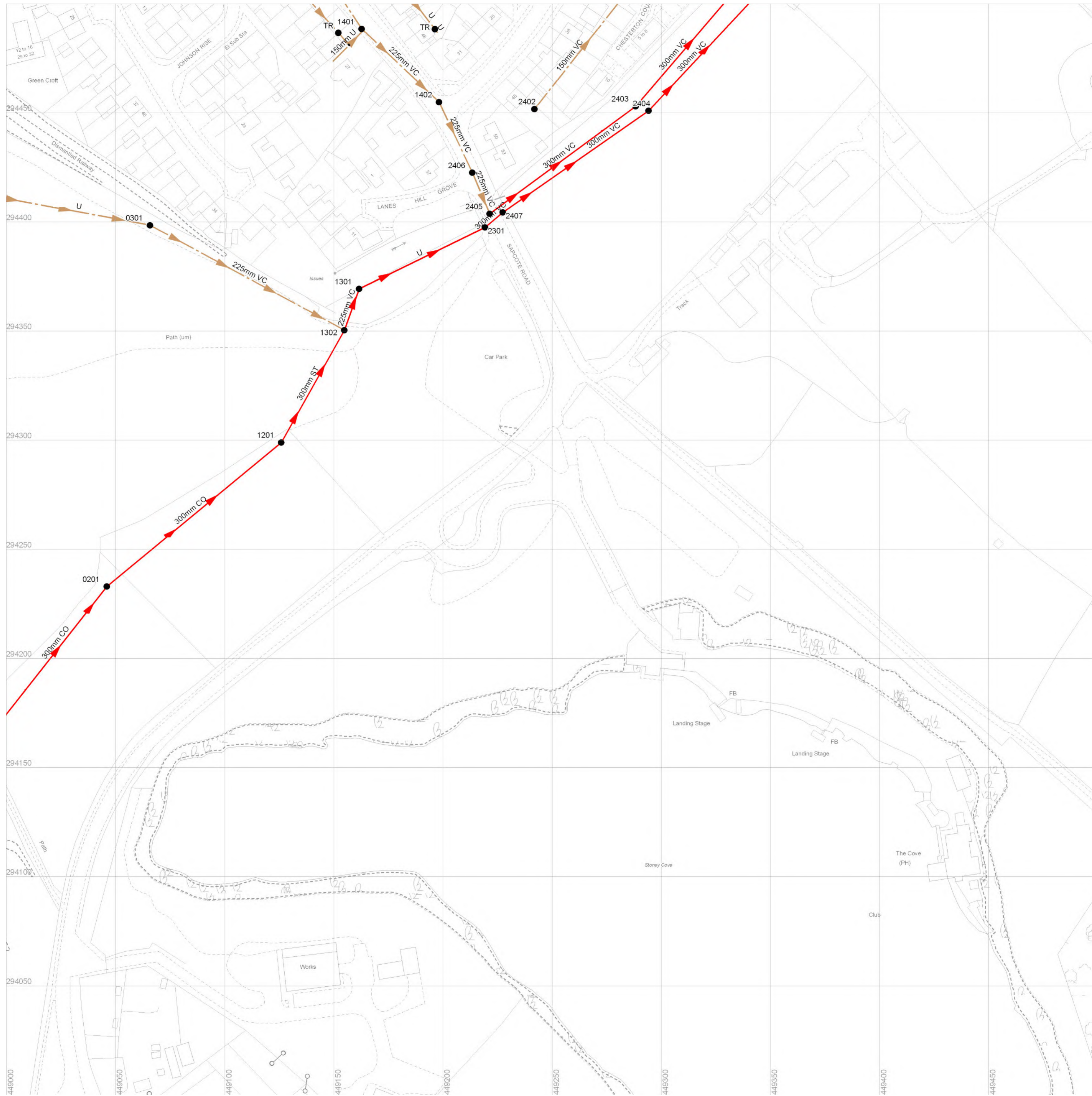
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SP4994NW



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SP49940201	82.10	80.82	79.85	C	CO	C	nil	nil	134.69	1979
SP49940301	84.69	82.01	79.67	F	VC	C	225	nil	43.21	1979
SP49941201	81.36	79.84	79.66	C	ST	C	300	nil	328.11	nil
SP49941301	nil	nil	78.04	C	U	U	nil	nil	0.00	1979
SP49941302	81.25	79.56	nil	C	VC	C	225	nil	0.00	1979
SP49941401	82.17	80.41	79.10	F	VC	C	225	nil	36.72	1979
SP49941402	80.83	79.05	78.37	F	VC	C	225	nil	53.93	1979
SP49942301	79.91	77.89	77.79	C	VC	C	300	nil	104.20	1979
SP49942402	79.61	78.82	76.91	F	VC	C	150	nil	53.80	1979
SP49942403	77.87	76.73	76.51	C	VC	C	300	nil	425.50	1979
SP49942404	77.87	76.80	76.39	C	VC	C	300	nil	193.29	1979
SP49942405	79.92	77.72	76.75	C	VC	C	300	nil	84.13	1979
SP49942406	80.04	78.36	78.00	F	VC	C	225	nil	54.72	1979
SP49942407	79.99	77.77	76.81	C	VC	C	300	nil	83.36	1979
U	nil	nil	nil	F	U	nil	nil	nil	0.00	nil

SP4894SE

SP4994SE

SP4993NW

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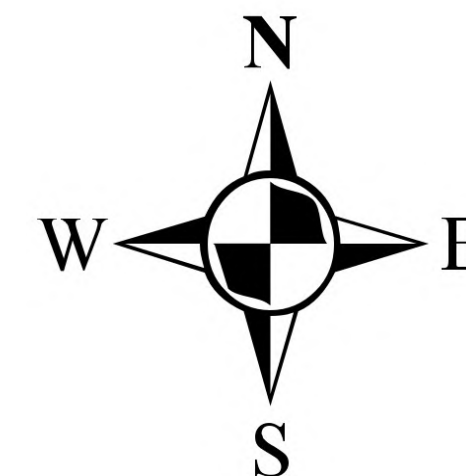
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Asset Data Management  
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**SEWER RECORD (TABULAR)**

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## APPENDICES

### Appendix 5: Greenfield Runoff Rate Calculations



5th Floor, Waterfront House  
35 Station Street  
Nottingham, NG2 3DQ

NTT2814  
HINCKLEY  
NORTHERN CATCHMENT



Date 19/05/2021  
File

Designed by RJ  
Checked by

Innovyze Source Control 2019.1

IH 124 Mean Annual Flood

Input

Return Period (years)	2	Soil	0.450
Area (ha)	102.100	Urban	0.000
SAAR (mm)	700	Region Number	Region 4


**Results      l/s**

QBAR Rural    414.7  
QBAR Urban    414.7

Q2 years      371.6

Q1 year      344.2  
Q2 years      371.6  
Q5 years      510.0  
Q10 years     617.8  
Q20 years     737.0  
Q25 years     778.7  
Q30 years     812.5  
Q50 years     913.1  
Q100 years    1065.7  
Q200 years    1252.3  
Q250 years    1314.5  
Q1000 years   1725.0



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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY SOUTHERN CATCHMENT	
Date 19/05/2021 File	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

IH 124 Mean Annual Flood

Input

Return Period (years)	2	Soil	0.450
Area (ha)	89.800	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

**Results      1/s**


QBAR Rural	369.9
QBAR Urban	369.9
 Q2 years	 331.5
Q1 year	307.0
Q2 years	331.5
Q5 years	455.0
Q10 years	551.1
Q20 years	657.4
Q25 years	694.7
Q30 years	724.7
Q50 years	814.5
Q100 years	950.6
Q200 years	1117.1
Q250 years	1172.6
Q1000 years	1538.8



## APPENDICES

### Appendix 6: Greenfield Runoff Volume Calculation



BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY GREENFIELD VOLUME	
Date 24/08/2022 File	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.800
Ratio R	0.400
Areal Reduction Factor	1.00
Area (ha)	191.000
SAAR (mm)	700
CWI	105.000
Urban	0.000
SPR	47.000

Results

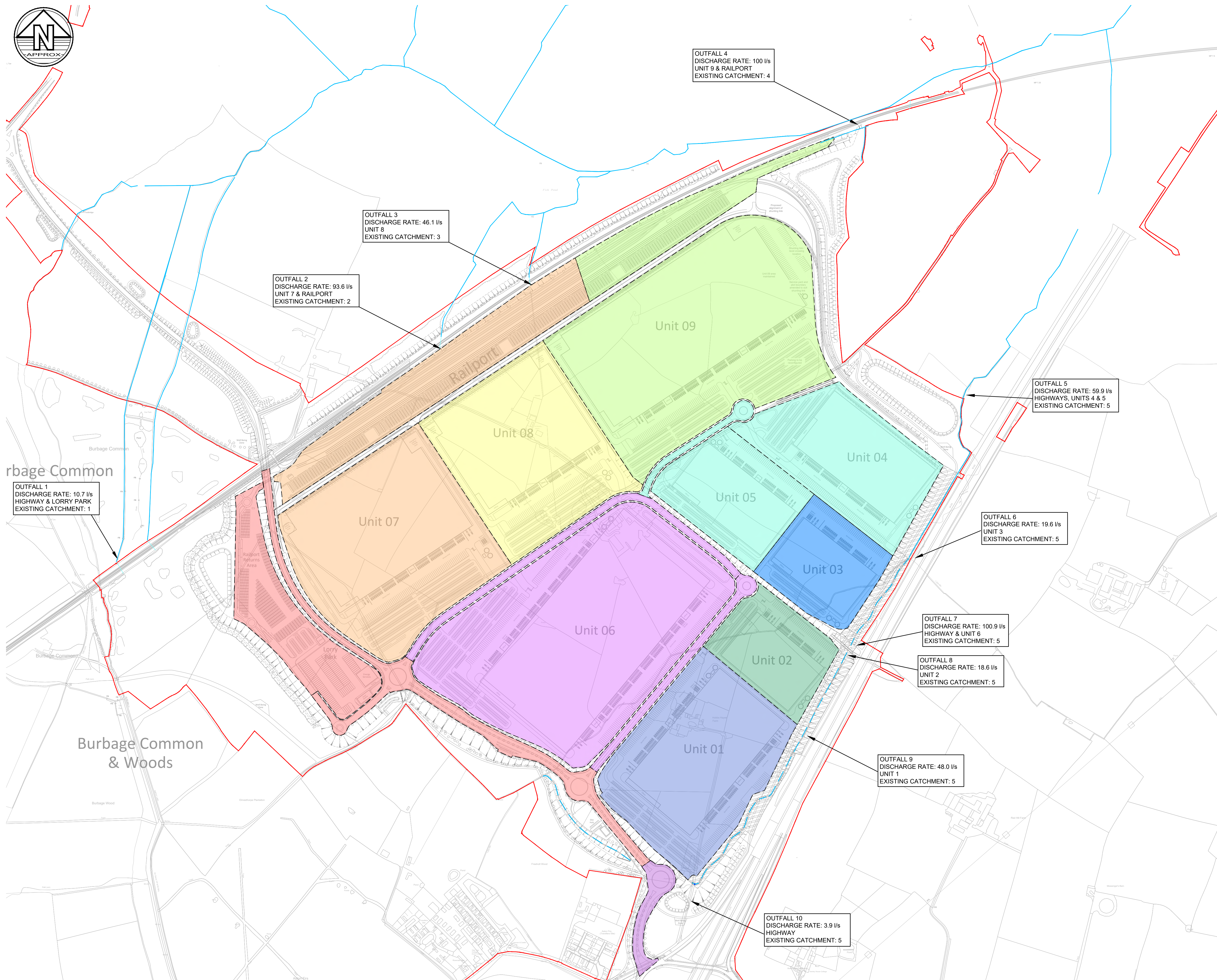
Percentage Runoff (%)	45.91
Greenfield Runoff Volume (m <sup>3</sup> )	54342.670



## APPENDICES

### Appendix 7: Proposed Catchment Plan





**OUTFALL 1**  
DISCHARGE RATE: 10.7 l/s  
HIGHWAY & LORRY PARK  
EXISTING CATCHMENT: 1

**OUTFALL 2**  
DISCHARGE RATE: 93.6 l/s  
UNIT 7 & RAILPORT  
EXISTING CATCHMENT: 2

**OUTFALL 3**  
DISCHARGE RATE: 46.1 l/s  
UNIT 8  
EXISTING CATCHMENT: 3

**OUTFALL 4**  
DISCHARGE RATE: 100 l/s  
UNIT 9 & RAILPORT  
EXISTING CATCHMENT: 4

**OUTFALL 5**  
DISCHARGE RATE: 59.9 l/s  
HIGHWAYS, UNITS 4 & 5  
EXISTING CATCHMENT: 5

**OUTFALL 6**  
DISCHARGE RATE: 19.6 l/s  
UNIT 3  
EXISTING CATCHMENT: 5

**OUTFALL 7**  
DISCHARGE RATE: 100.9 l/s  
HIGHWAY & UNIT 6  
EXISTING CATCHMENT: 5

**OUTFALL 8**  
DISCHARGE RATE: 18.6 l/s  
UNIT 2  
EXISTING CATCHMENT: 5

**OUTFALL 9**  
DISCHARGE RATE: 48.0 l/s  
UNIT 1  
EXISTING CATCHMENT: 5

**OUTFALL 10**  
DISCHARGE RATE: 3.9 l/s  
HIGHWAY  
EXISTING CATCHMENT: 5

- Notes**
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
  - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer immediately.
  - Drawing provided for illustrative purposes only. Design subject to further coordination and approvals.
  - Layout based on AJA drawing: 5905-177.
  - Attenuation indicatively sized for the 1 in 100 year storm event plus a 25% allowance for climate change for the estimated impermeable areas. Allowance made for 650m<sup>3</sup> storage per 1ha of impermeable area. To be agreed with the LLFA.
  - Equivalent greenfield runoff rates have been estimate to be 4.1 l/s/ha. To be agreed with the LLFA.

**Legend**

CATCHMENT & OUTFALL SUMMARY		
REFERENCE	CONTRIBUTING AREA (ha)	DISCHARGE RATE (l/s)
1	9.16	10.7
2	22.45	92.0
3	11.90	46.1
4	24.39	100.0
5	14.62	59.9
6	4.77	19.6
7	24.63	100.9
8	4.54	18.6
9	11.71	48.0
10	0.95	3.9

Rev	Date	Details of issue / revision	Drw	Rev
P04	05.09.22	Updated to latest masterplan	RJ	CD
P03	14.12.21	Updated to latest masterplan	RJ	CD
P02	01.10.21	Updated to latest masterplan	RJ	CD
P01	25.05.21	Preliminary Issue	RJ	CD

**Issues & Revisions**

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Client  
**TRITAX SYMMETRY**

Project Title  
**HINCKLEY RAIL FREIGHT INTERCHANGE**

Drawing Title  
**PROPOSED CATCHMENT PLAN**


Drawn:	RJ	Reviewed:	CD
BWB Ref:	NTT 2814	Date:	25.05.21
Scale:	@A1: 1:4000		
<b>PRELIMINARY</b>			
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev	
HRF-BWB-EWE-ZZ-DR-CD-00503	S2	P04	



## APPENDICES

### Appendix 8: Source Control Calculations




BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FEH STORAGE ESTIMATE	
Date 25/05/2022 File STORAGE BASIN PER HA FE...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.112	0.412	4.1	225.5	O K
30 min Summer	99.221	0.521	4.1	294.9	O K
60 min Summer	99.326	0.626	4.1	365.2	O K
120 min Summer	99.431	0.731	4.1	440.2	O K
180 min Summer	99.491	0.791	4.1	485.4	O K
240 min Summer	99.530	0.830	4.1	515.3	O K
360 min Summer	99.574	0.874	4.1	549.2	O K
480 min Summer	99.591	0.891	4.1	563.2	O K
600 min Summer	99.596	0.896	4.1	567.0	O K
720 min Summer	99.593	0.893	4.1	564.8	O K
960 min Summer	99.575	0.875	4.1	550.1	O K
1440 min Summer	99.525	0.825	4.1	511.3	O K
2160 min Summer	99.462	0.762	4.1	463.2	O K
2880 min Summer	99.409	0.709	4.1	424.6	O K
4320 min Summer	99.318	0.618	4.1	359.6	O K
5760 min Summer	99.235	0.535	4.1	303.5	O K
7200 min Summer	99.171	0.471	4.1	262.4	O K
8640 min Summer	99.119	0.419	4.1	229.8	O K
10080 min Summer	99.077	0.377	4.1	204.0	O K
15 min Winter	99.156	0.456	4.1	252.9	O K
30 min Winter	99.276	0.576	4.1	330.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	121.903	0.0	218.8	19
30 min Summer	80.162	0.0	284.3	34
60 min Summer	50.146	0.0	371.4	64
120 min Summer	30.797	0.0	455.4	124
180 min Summer	23.054	0.0	510.0	184
240 min Summer	18.681	0.0	549.1	242
360 min Summer	13.737	0.0	599.2	362
480 min Summer	10.934	0.0	624.3	482
600 min Summer	9.112	0.0	631.3	602
720 min Summer	7.828	0.0	628.4	722
960 min Summer	6.126	0.0	617.2	960
1440 min Summer	4.308	0.0	589.1	1210
2160 min Summer	3.022	0.0	812.5	1576
2880 min Summer	2.358	0.0	844.6	1988
4320 min Summer	1.682	0.0	901.0	2808
5760 min Summer	1.338	0.0	962.4	3568
7200 min Summer	1.134	0.0	1019.0	4320
8640 min Summer	0.999	0.0	1076.3	5016
10080 min Summer	0.903	0.0	1134.1	5752
15 min Winter	121.903	0.0	244.5	19
30 min Winter	80.162	0.0	312.5	33




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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FEH STORAGE ESTIMATE	
Date 25/05/2022 File STORAGE BASIN PER HA FE...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	99.389	0.689	4.1	410.2	O K
120 min Winter	99.504	0.804	4.1	495.1	O K
180 min Winter	99.571	0.871	4.1	546.9	O K
240 min Winter	99.614	0.914	4.1	581.6	O K
360 min Winter	99.664	0.964	4.1	621.9	O K
480 min Winter	99.686	0.986	4.1	640.1	O K
600 min Winter	99.694	0.994	4.1	646.9	O K
720 min Winter	99.694	0.994	4.1	646.9	O K
960 min Winter	99.680	0.980	4.1	635.3	O K
1440 min Winter	99.629	0.929	4.1	593.8	O K
2160 min Winter	99.554	0.854	4.1	533.3	O K
2880 min Winter	99.488	0.788	4.1	482.7	O K
4320 min Winter	99.367	0.667	4.1	394.2	O K
5760 min Winter	99.236	0.536	4.1	304.5	O K
7200 min Winter	99.134	0.434	4.1	239.1	O K
8640 min Winter	99.053	0.353	4.1	189.6	O K
10080 min Winter	98.990	0.290	4.1	152.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	50.146	0.0	415.7	64
120 min Winter	30.797	0.0	508.8	122
180 min Winter	23.054	0.0	568.1	180
240 min Winter	18.681	0.0	607.9	240
360 min Winter	13.737	0.0	642.6	356
480 min Winter	10.934	0.0	642.3	472
600 min Winter	9.112	0.0	638.0	588
720 min Winter	7.828	0.0	632.8	702
960 min Winter	6.126	0.0	621.8	924
1440 min Winter	4.308	0.0	598.4	1344
2160 min Winter	3.022	0.0	909.6	1668
2880 min Winter	2.358	0.0	945.3	2136
4320 min Winter	1.682	0.0	1005.5	3068
5760 min Winter	1.338	0.0	1078.1	3816
7200 min Winter	1.134	0.0	1141.5	4544
8640 min Winter	0.999	0.0	1205.8	5272
10080 min Winter	0.903	0.0	1270.9	5952



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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FEH STORAGE ESTIMATE	
Date 25/05/2022 File STORAGE BASIN PER HA FE...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

Rainfall Details


Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 446317 295054 SP 46317 95054
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+25

Time Area Diagram

Total Area (ha) 1.000

<b>Time (mins)</b>		<b>Area</b>
<b>From:</b>	<b>To:</b>	<b>(ha)</b>
0	4	1.000



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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FEH STORAGE ESTIMATE	
Date 25/05/2022 File STORAGE BASIN PER HA FE...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.700

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	480.0	0.400	612.3	0.800	760.7	1.200	925.2
0.100	511.6	0.500	647.9	0.900	800.3	1.300	968.8
0.200	544.1	0.600	684.5	1.000	840.9		
0.300	577.7	0.700	722.1	1.100	882.5		

Hydro-Brake® Optimum Outflow Control


Unit Reference MD-SHE-0096-4100-1000-4100  
Design Head (m) 1.000  
Design Flow (l/s) 4.1  
Flush-Flo™ Calculated  
Objective Minimise upstream storage  
Application Surface  
Sump Available Yes  
Diameter (mm) 96  
Invert Level (m) 98.700  
Minimum Outlet Pipe Diameter (mm) 150  
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	4.1
Flush-Flo™	0.294	4.1
Kick-Flo®	0.629	3.3
Mean Flow over Head Range	-	3.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	1.200	4.5	3.000	6.8	7.000	10.2
0.200	4.0	1.400	4.8	3.500	7.4	7.500	10.6
0.300	4.1	1.600	5.1	4.000	7.8	8.000	10.9
0.400	4.0	1.800	5.4	4.500	8.3	8.500	11.2
0.500	3.9	2.000	5.7	5.000	8.7	9.000	11.5
0.600	3.5	2.200	5.9	5.500	9.1	9.500	11.8
0.800	3.7	2.400	6.2	6.000	9.5		
1.000	4.1	2.600	6.4	6.500	9.9		




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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FSR STORAGE ESTIMATE	
Date 25/08/2022 File STORAGE BASIN PER HA FS...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.096	0.396	4.1	215.3	O K
30 min Summer	99.200	0.500	4.1	281.2	O K
60 min Summer	99.301	0.601	4.1	348.0	O K
120 min Summer	99.393	0.693	4.1	412.6	O K
180 min Summer	99.439	0.739	4.1	446.0	O K
240 min Summer	99.466	0.766	4.1	466.1	O K
360 min Summer	99.496	0.796	4.1	488.8	O K
480 min Summer	99.511	0.811	4.1	500.7	O K
600 min Summer	99.518	0.818	4.1	505.9	O K
720 min Summer	99.519	0.819	4.1	506.8	O K
960 min Summer	99.512	0.812	4.1	500.8	O K
1440 min Summer	99.484	0.784	4.1	480.1	O K
2160 min Summer	99.444	0.744	4.1	449.7	O K
2880 min Summer	99.404	0.704	4.1	420.6	O K
4320 min Summer	99.320	0.620	4.1	361.0	O K
5760 min Summer	99.231	0.531	4.1	301.1	O K
7200 min Summer	99.153	0.453	4.1	250.7	O K
8640 min Summer	99.084	0.384	4.1	207.9	O K
10080 min Summer	99.024	0.324	4.1	172.2	O K
15 min Winter	99.138	0.438	4.1	241.5	O K
30 min Winter	99.253	0.553	4.1	315.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	116.472	0.0	209.2	19
30 min Summer	76.493	0.0	272.4	34
60 min Summer	47.860	0.0	354.5	64
120 min Summer	28.933	0.0	428.1	124
180 min Summer	21.268	0.0	471.4	182
240 min Summer	16.995	0.0	501.4	242
360 min Summer	12.340	0.0	543.9	362
480 min Summer	9.835	0.0	574.6	482
600 min Summer	8.241	0.0	596.6	602
720 min Summer	7.130	0.0	610.7	720
960 min Summer	5.669	0.0	613.3	960
1440 min Summer	4.097	0.0	586.9	1194
2160 min Summer	2.956	0.0	794.6	1560
2880 min Summer	2.342	0.0	838.9	1988
4320 min Summer	1.685	0.0	902.8	2808
5760 min Summer	1.333	0.0	958.6	3528
7200 min Summer	1.111	0.0	998.1	4256
8640 min Summer	0.956	0.0	1030.8	5008
10080 min Summer	0.843	0.0	1058.0	5656
15 min Winter	116.472	0.0	233.9	19
30 min Winter	76.493	0.0	301.2	33




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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FSR STORAGE ESTIMATE	
Date 25/08/2022 File STORAGE BASIN PER HA FS...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	99.363	0.663	4.1	391.1	O K
120 min Winter	99.463	0.763	4.1	464.2	O K
180 min Winter	99.514	0.814	4.1	502.7	O K
240 min Winter	99.544	0.844	4.1	526.2	O K
360 min Winter	99.580	0.880	4.1	553.9	O K
480 min Winter	99.599	0.899	4.1	569.5	O K
600 min Winter	99.610	0.910	4.1	577.7	O K
720 min Winter	99.614	0.914	4.1	581.1	O K
960 min Winter	99.611	0.911	4.1	578.9	O K
1440 min Winter	99.583	0.883	4.1	556.6	O K
2160 min Winter	99.533	0.833	4.1	517.4	O K
2880 min Winter	99.481	0.781	4.1	477.9	O K
4320 min Winter	99.369	0.669	4.1	395.7	O K
5760 min Winter	99.231	0.531	4.1	301.5	O K
7200 min Winter	99.113	0.413	4.1	225.7	O K
8640 min Winter	99.013	0.313	4.1	166.2	O K
10080 min Winter	98.937	0.237	4.1	122.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	47.860	0.0	396.9	64
120 min Winter	28.933	0.0	478.7	122
180 min Winter	21.268	0.0	526.3	180
240 min Winter	16.995	0.0	558.8	240
360 min Winter	12.340	0.0	602.2	356
480 min Winter	9.835	0.0	626.8	472
600 min Winter	8.241	0.0	632.4	588
720 min Winter	7.130	0.0	629.0	700
960 min Winter	5.669	0.0	618.1	924
1440 min Winter	4.097	0.0	593.8	1340
2160 min Winter	2.956	0.0	889.7	1668
2880 min Winter	2.342	0.0	939.0	2132
4320 min Winter	1.685	0.0	1007.4	3068
5760 min Winter	1.333	0.0	1073.7	3808
7200 min Winter	1.111	0.0	1118.1	4536
8640 min Winter	0.956	0.0	1154.8	5184
10080 min Winter	0.843	0.0	1185.7	5840



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5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FSR STORAGE ESTIMATE	
Date 25/08/2022 File STORAGE BASIN PER HA FS...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

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)	19.700	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 1.000

Time (mins)		Area
From:	To:	(ha)
0	4	1.000



BWB Consulting Ltd		Page 4
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ	NTT2814 HINCKLEY FSR STORAGE ESTIMATE	
Date 25/08/2022 File STORAGE BASIN PER HA FS...	Designed by RJ Checked by	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.700

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	480.0	0.400	612.3	0.800	760.7	1.200	925.2
0.100	511.6	0.500	647.9	0.900	800.3	1.300	968.8
0.200	544.1	0.600	684.5	1.000	840.9		
0.300	577.7	0.700	722.1	1.100	882.5		

Hydro-Brake® Optimum Outflow Control


Unit Reference	MD-SHE-0096-4100-1000-4100
Design Head (m)	1.000
Design Flow (l/s)	4.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	96
Invert Level (m)	98.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	4.1
Flush-Flo™	0.294	4.1
Kick-Flo®	0.629	3.3
Mean Flow over Head Range	-	3.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	1.200	4.5	3.000	6.8	7.000	10.2
0.200	4.0	1.400	4.8	3.500	7.4	7.500	10.6
0.300	4.1	1.600	5.1	4.000	7.8	8.000	10.9
0.400	4.0	1.800	5.4	4.500	8.3	8.500	11.2
0.500	3.9	2.000	5.7	5.000	8.7	9.000	11.5
0.600	3.5	2.200	5.9	5.500	9.1	9.500	11.8
0.800	3.7	2.400	6.2	6.000	9.5		
1.000	4.1	2.600	6.4	6.500	9.9		




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Innovyze	Source Control 2019.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.156	0.456	4.1	252.9	O K
30 min Summer	99.276	0.576	4.1	331.0	O K
60 min Summer	99.390	0.690	4.1	410.3	O K
120 min Summer	99.504	0.804	4.1	494.9	O K
180 min Summer	99.570	0.870	4.1	546.3	O K
240 min Summer	99.613	0.913	4.1	580.7	O K
360 min Summer	99.662	0.962	4.1	620.5	O K
480 min Summer	99.683	0.983	4.1	638.0	O K
600 min Summer	99.690	0.990	4.1	644.0	O K
720 min Summer	99.690	0.990	4.1	643.3	O K
960 min Summer	99.673	0.973	4.1	629.9	O K
1440 min Summer	99.623	0.923	4.1	588.8	O K
2160 min Summer	99.558	0.858	4.1	537.1	O K
2880 min Summer	99.506	0.806	4.1	496.9	O K
4320 min Summer	99.424	0.724	4.1	435.4	O K
5760 min Summer	99.354	0.654	4.1	385.3	O K
7200 min Summer	99.285	0.585	4.1	337.5	O K
8640 min Summer	99.229	0.529	4.1	299.8	O K
10080 min Summer	99.183	0.483	4.1	269.9	O K
15 min Winter	99.204	0.504	4.1	283.5	O K
30 min Winter	99.335	0.635	4.1	371.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	136.531	0.0	244.5	19
30 min Summer	89.782	0.0	312.5	34
60 min Summer	56.163	0.0	415.7	64
120 min Summer	34.492	0.0	508.8	124
180 min Summer	25.821	0.0	568.1	184
240 min Summer	20.923	0.0	608.0	242
360 min Summer	15.386	0.0	643.0	362
480 min Summer	12.246	0.0	643.0	482
600 min Summer	10.205	0.0	638.9	602
720 min Summer	8.767	0.0	633.9	722
960 min Summer	6.861	0.0	623.0	960
1440 min Summer	4.825	0.0	598.9	1242
2160 min Summer	3.385	0.0	909.6	1604
2880 min Summer	2.641	0.0	945.1	2016
4320 min Summer	1.884	0.0	1002.9	2852
5760 min Summer	1.499	0.0	1078.0	3688
7200 min Summer	1.270	0.0	1141.5	4464
8640 min Summer	1.118	0.0	1205.7	5184
10080 min Summer	1.012	0.0	1270.6	5944
15 min Winter	136.531	0.0	272.4	19
30 min Winter	89.782	0.0	330.3	34




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Innovyze	Source Control 2019.1	

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	99.458	0.758	4.1	460.5	O K
120 min Winter	99.583	0.883	4.1	556.5	O K
180 min Winter	99.656	0.956	4.1	615.4	O K
240 min Winter	99.704	1.004	4.1	655.2	Flood Risk
360 min Winter	99.759	1.059	4.2	702.4	Flood Risk
480 min Winter	99.785	1.085	4.3	724.8	Flood Risk
600 min Winter	99.795	1.095	4.3	734.2	Flood Risk
<b>720 min Winter</b>	<b>99.797</b>	<b>1.097</b>	<b>4.3</b>	<b>736.0</b>	<b>Flood Risk</b>
960 min Winter	99.786	1.086	4.3	726.3	Flood Risk
1440 min Winter	99.739	1.039	4.2	685.6	Flood Risk
2160 min Winter	99.662	0.962	4.1	620.8	O K
2880 min Winter	99.599	0.899	4.1	569.0	O K
4320 min Winter	99.487	0.787	4.1	482.4	O K
5760 min Winter	99.386	0.686	4.1	407.6	O K
7200 min Winter	99.275	0.575	4.1	330.2	O K
8640 min Winter	99.180	0.480	4.1	268.3	O K
10080 min Winter	99.106	0.406	4.1	221.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	56.163	0.0	465.0	64
120 min Winter	34.492	0.0	567.0	122
180 min Winter	25.821	0.0	626.1	180
240 min Winter	20.923	0.0	649.8	240
360 min Winter	15.386	0.0	651.0	356
480 min Winter	12.246	0.0	648.0	474
600 min Winter	10.205	0.0	644.6	590
<b>720 min Winter</b>	<b>8.767</b>	<b>0.0</b>	<b>641.1</b>	<b>704</b>
960 min Winter	6.861	0.0	633.5	930
1440 min Winter	4.825	0.0	618.2	1356
2160 min Winter	3.385	0.0	1017.9	1692
2880 min Winter	2.641	0.0	1056.8	2160
4320 min Winter	1.884	0.0	1101.8	3072
5760 min Winter	1.499	0.0	1207.4	3976
7200 min Winter	1.270	0.0	1278.6	4760
8640 min Winter	1.118	0.0	1350.7	5456
10080 min Winter	1.012	0.0	1423.8	6160



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Innovyze	Source Control 2019.1	

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 446317 295054 SP 46317 95054
Data Type	Point
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) 1.000

**Time (mins) Area**  
**From: To: (ha)**

0 4 1.000



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Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.700

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	480.0	0.400	612.3	0.800	760.7	1.200	925.2
0.100	511.6	0.500	647.9	0.900	800.3	1.300	968.8
0.200	544.1	0.600	684.5	1.000	840.9		
0.300	577.7	0.700	722.1	1.100	882.5		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0096-4100-1000-4100
Design Head (m)	1.000
Design Flow (l/s)	4.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	96
Invert Level (m)	98.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	4.1
Flush-Flo™	0.294	4.1
Kick-Flo®	0.629	3.3
Mean Flow over Head Range	-	3.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	1.200	4.5	3.000	6.8	7.000	10.2
0.200	4.0	1.400	4.8	3.500	7.4	7.500	10.6
0.300	4.1	1.600	5.1	4.000	7.8	8.000	10.9
0.400	4.0	1.800	5.4	4.500	8.3	8.500	11.2
0.500	3.9	2.000	5.7	5.000	8.7	9.000	11.5
0.600	3.5	2.200	5.9	5.500	9.1	9.500	11.8
0.800	3.7	2.400	6.2	6.000	9.5		
1.000	4.1	2.600	6.4	6.500	9.9		



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Innovyze		Source Control 2019.1



Summary of Results for 100 year Return Period (+25%)

Half Drain Time : 1472 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	8.328	0.328	0.0	45.3	45.3	2683.4	O K
30 min Summer	8.430	0.430	0.0	46.1	46.1	3514.7	O K
60 min Summer	8.534	0.534	0.0	46.1	46.1	4362.3	O K
120 min Summer	8.647	0.647	0.0	46.1	46.1	5283.4	O K
180 min Summer	8.717	0.717	0.0	46.1	46.1	5857.1	O K
240 min Summer	8.765	0.765	0.0	46.1	46.1	6253.3	O K
360 min Summer	8.824	0.824	0.0	46.1	46.1	6735.7	O K
480 min Summer	8.854	0.854	0.0	46.1	46.1	6973.5	O K
600 min Summer	8.867	0.867	0.0	46.1	46.1	7084.6	O K
720 min Summer	8.872	0.872	0.0	46.1	46.1	7121.3	O K
960 min Summer	8.864	0.864	0.0	46.1	46.1	7061.1	O K
1440 min Summer	8.827	0.827	0.0	46.1	46.1	6757.8	O K
2160 min Summer	8.775	0.775	0.0	46.1	46.1	6331.1	O K
2880 min Summer	8.727	0.727	0.0	46.1	46.1	5942.7	O K
4320 min Summer	8.650	0.650	0.0	46.1	46.1	5308.4	O K
5760 min Summer	8.586	0.586	0.0	46.1	46.1	4789.2	O K
7200 min Summer	8.537	0.537	0.0	46.1	46.1	4384.1	O K
8640 min Summer	8.496	0.496	0.0	46.1	46.1	4053.3	O K
10080 min Summer	8.464	0.464	0.0	46.1	46.1	3788.3	O K
15 min Winter	8.368	0.368	0.0	45.8	45.8	3008.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	121.903	0.0	1976.0	26
30 min Summer	80.162	0.0	2661.5	41
60 min Summer	50.146	0.0	3973.9	70
120 min Summer	30.797	0.0	4894.6	130
180 min Summer	23.054	0.0	5473.7	190
240 min Summer	18.681	0.0	5873.1	248
360 min Summer	13.737	0.0	6365.6	368
480 min Summer	10.934	0.0	6628.1	486
600 min Summer	9.112	0.0	6763.8	604
720 min Summer	7.828	0.0	6817.3	724
960 min Summer	6.126	0.0	6757.3	962
1440 min Summer	4.308	0.0	6338.3	1246
2160 min Summer	3.022	0.0	9246.5	1608
2880 min Summer	2.358	0.0	9564.6	1968
4320 min Summer	1.682	0.0	10020.3	2768
5760 min Summer	1.338	0.0	11286.3	3536
7200 min Summer	1.134	0.0	11927.5	4328
8640 min Summer	0.999	0.0	12551.8	5096
10080 min Summer	0.903	0.0	13130.9	5848
15 min Winter	121.903	0.0	2245.7	26






Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	8.483	0.483	0.0	46.1	46.1	3942.4	O K
60 min Winter	8.599	0.599	0.0	46.1	46.1	4897.4	O K
120 min Winter	8.727	0.727	0.0	46.1	46.1	5939.5	O K
180 min Winter	8.807	0.807	0.0	46.1	46.1	6594.3	O K
240 min Winter	8.862	0.862	0.0	46.1	46.1	7042.1	O K
360 min Winter	8.929	0.929	0.0	46.1	46.1	7586.3	O K
480 min Winter	8.962	0.962	0.0	46.1	46.1	7862.7	O K
600 min Winter	8.979	0.979	0.0	46.1	46.1	7999.5	O K
720 min Winter	8.986	0.986	0.0	46.1	46.1	8054.1	O K
960 min Winter	8.981	0.981	0.0	46.1	46.1	8017.1	O K
1440 min Winter	8.943	0.943	0.0	46.1	46.1	7700.3	O K
2160 min Winter	8.875	0.875	0.0	46.1	46.1	7148.7	O K
2880 min Winter	8.816	0.816	0.0	46.1	46.1	6670.7	O K
4320 min Winter	8.700	0.700	0.0	46.1	46.1	5716.3	O K
5760 min Winter	8.600	0.600	0.0	46.1	46.1	4898.3	O K
7200 min Winter	8.520	0.520	0.0	46.1	46.1	4248.5	O K
8640 min Winter	8.456	0.456	0.0	46.1	46.1	3727.0	O K
10080 min Winter	8.406	0.406	0.0	46.0	46.0	3315.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	80.162	0.0	2978.2	41
60 min Winter	50.146	0.0	4465.9	70
120 min Winter	30.797	0.0	5469.3	128
180 min Winter	23.054	0.0	6077.1	186
240 min Winter	18.681	0.0	6480.7	244
360 min Winter	13.737	0.0	6937.4	362
480 min Winter	10.934	0.0	7119.5	478
600 min Winter	9.112	0.0	7149.1	592
720 min Winter	7.828	0.0	7088.7	708
960 min Winter	6.126	0.0	6902.0	932
1440 min Winter	4.308	0.0	6491.3	1360
2160 min Winter	3.022	0.0	10336.2	1696
2880 min Winter	2.358	0.0	10658.9	2164
4320 min Winter	1.682	0.0	11106.4	3028
5760 min Winter	1.338	0.0	12655.2	3816
7200 min Winter	1.134	0.0	13381.4	4608
8640 min Winter	0.999	0.0	14091.0	5360
10080 min Winter	0.903	0.0	14759.4	6056



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Innovyze	Source Control 2019.1	

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 446317 295054 SP 46317 95054
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+25

Time Area Diagram

Total Area (ha) 11.900

Time (mins)		Area	Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	3.960	4	8	3.970	8	12	3.970



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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 8.000 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	8600.0	0.0	1.100	0.0	0.0
1.000	8600.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0284-4610-1000-4610  
 Design Head (m) 1.000  
 Design Flow (l/s) 46.1  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 284  
 Invert Level (m) 8.000  
 Minimum Outlet Pipe Diameter (mm) 300  
 Suggested Manhole Diameter (mm) 1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	46.1
Flush-Flo™	0.435	46.1
Kick-Flo®	0.777	40.8
Mean Flow over Head Range	-	37.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.9	1.200	50.3	3.000	78.4	7.000	118.5
0.200	29.3	1.400	54.2	3.500	84.5	7.500	122.6
0.300	44.8	1.600	57.8	4.000	90.2	8.000	126.5
0.400	46.0	1.800	61.2	4.500	95.5	8.500	130.3
0.500	45.9	2.000	64.4	5.000	100.6	9.000	134.0
0.600	45.0	2.200	67.5	5.500	105.3	9.500	137.6
0.800	41.4	2.400	70.4	6.000	109.9		
1.000	46.1	2.600	73.2	6.500	114.3		



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Date 03/09/2022 File LINK ROAD - CENTRAL.SRCX		Designed by RJ Checked by
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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	9.285	0.285	2.8	130.6	O K
30 min Summer	9.363	0.363	2.8	170.6	O K
60 min Summer	9.438	0.438	2.8	210.8	O K
120 min Summer	9.514	0.514	2.8	253.6	O K
180 min Summer	9.557	0.557	2.8	278.9	O K
240 min Summer	9.585	0.585	2.8	295.3	O K
360 min Summer	9.614	0.614	2.8	313.0	O K
480 min Summer	9.624	0.624	2.8	319.2	O K
600 min Summer	9.624	0.624	2.8	319.6	O K
720 min Summer	9.620	0.620	2.8	316.6	O K
960 min Summer	9.601	0.601	2.8	305.2	O K
1440 min Summer	9.563	0.563	2.8	282.4	O K
2160 min Summer	9.513	0.513	2.8	253.0	O K
2880 min Summer	9.468	0.468	2.8	227.5	O K
4320 min Summer	9.387	0.387	2.8	183.1	O K
5760 min Summer	9.325	0.325	2.8	150.7	O K
7200 min Summer	9.277	0.277	2.8	126.4	O K
8640 min Summer	9.239	0.239	2.8	107.7	O K
10080 min Summer	9.210	0.210	2.8	93.6	O K
15 min Winter	9.317	0.317	2.8	146.4	O K
30 min Winter	9.402	0.402	2.8	191.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	121.903	0.0	126.3	19
30 min Summer	80.162	0.0	165.6	34
60 min Summer	50.146	0.0	215.0	64
120 min Summer	30.797	0.0	264.0	124
180 min Summer	23.054	0.0	296.1	182
240 min Summer	18.681	0.0	319.6	242
360 min Summer	13.737	0.0	351.5	362
480 min Summer	10.934	0.0	371.8	482
600 min Summer	9.112	0.0	385.8	600
720 min Summer	7.828	0.0	395.8	720
960 min Summer	6.126	0.0	407.3	896
1440 min Summer	4.308	0.0	402.9	1124
2160 min Summer	3.022	0.0	471.1	1512
2880 min Summer	2.358	0.0	489.8	1932
4320 min Summer	1.682	0.0	523.2	2680
5760 min Summer	1.338	0.0	558.0	3456
7200 min Summer	1.134	0.0	590.7	4176
8640 min Summer	0.999	0.0	623.8	4848
10080 min Summer	0.903	0.0	657.1	5552
15 min Winter	121.903	0.0	141.5	19
30 min Winter	80.162	0.0	184.4	33



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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	9.485	0.485	2.8	237.0	O K
120 min Winter	9.568	0.568	2.8	285.3	O K
180 min Winter	9.616	0.616	2.8	314.4	O K
240 min Winter	9.647	0.647	2.8	333.4	O K
360 min Winter	9.681	0.681	2.8	354.7	O K
480 min Winter	9.694	0.694	2.8	363.3	O K
600 min Winter	9.697	0.697	2.8	365.3	O K
720 min Winter	9.694	0.694	2.8	363.4	O K
960 min Winter	9.678	0.678	2.8	353.3	O K
1440 min Winter	9.633	0.633	2.8	324.7	O K
2160 min Winter	9.572	0.572	2.8	288.1	O K
2880 min Winter	9.515	0.515	2.8	254.3	O K
4320 min Winter	9.397	0.397	2.8	188.4	O K
5760 min Winter	9.301	0.301	2.8	138.4	O K
7200 min Winter	9.229	0.229	2.8	102.7	O K
8640 min Winter	9.177	0.177	2.8	77.9	O K
10080 min Winter	9.142	0.142	2.7	61.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	50.146	0.0	240.8	62
120 min Winter	30.797	0.0	295.4	122
180 min Winter	23.054	0.0	331.1	180
240 min Winter	18.681	0.0	357.0	238
360 min Winter	13.737	0.0	391.4	356
480 min Winter	10.934	0.0	412.1	472
600 min Winter	9.112	0.0	424.6	584
720 min Winter	7.828	0.0	430.9	698
960 min Winter	6.126	0.0	429.0	914
1440 min Winter	4.308	0.0	410.3	1182
2160 min Winter	3.022	0.0	527.6	1624
2880 min Winter	2.358	0.0	548.5	2080
4320 min Winter	1.682	0.0	585.9	2896
5760 min Winter	1.338	0.0	625.1	3632
7200 min Winter	1.134	0.0	661.8	4328
8640 min Winter	0.999	0.0	698.9	5008
10080 min Winter	0.903	0.0	736.5	5640



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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 446317 295054 SP 46317 95054
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+25

Time Area Diagram

Total Area (ha) 0.580

<b>Time (mins)</b>		<b>Area</b>
<b>From:</b>	<b>To:</b>	<b>(ha)</b>
0	4	0.580



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Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	415.0	0.300	506.2	0.600	606.4	0.900	715.7
0.100	444.4	0.400	538.6	0.700	641.8	1.000	754.1
0.200	474.8	0.500	572.0	0.800	678.3		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0084-2800-0700-2800
Design Head (m)	0.700
Design Flow (l/s)	2.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	84
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	2.8
Flush-Flo™	0.210	2.8
Kick-Flo®	0.462	2.3
Mean Flow over Head Range	-	2.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	3.6	3.000	5.5	7.000	8.2
0.200	2.8	1.400	3.8	3.500	5.9	7.500	8.5
0.300	2.7	1.600	4.1	4.000	6.3	8.000	8.7
0.400	2.6	1.800	4.3	4.500	6.6	8.500	9.0
0.500	2.4	2.000	4.5	5.000	7.0	9.000	9.3
0.600	2.6	2.200	4.7	5.500	7.3	9.500	9.5
0.800	3.0	2.400	4.9	6.000	7.6		
1.000	3.3	2.600	5.1	6.500	7.9		



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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	9.317	0.317	2.8	146.4	O K
30 min Summer	9.402	0.402	2.8	191.5	O K
60 min Summer	9.485	0.485	2.8	237.1	O K
120 min Summer	9.568	0.568	2.8	285.2	O K
180 min Summer	9.615	0.615	2.8	314.1	O K
240 min Summer	9.646	0.646	2.8	333.0	O K
360 min Summer	9.680	0.680	2.8	353.9	O K
480 min Summer	9.692	0.692	2.8	362.0	O K
600 min Summer	9.695	0.695	2.8	363.5	O K
720 min Summer	9.691	0.691	2.8	361.2	O K
960 min Summer	9.673	0.673	2.8	349.9	O K
1440 min Summer	9.634	0.634	2.8	325.3	O K
2160 min Summer	9.583	0.583	2.8	294.3	O K
2880 min Summer	9.540	0.540	2.8	269.1	O K
4320 min Summer	9.468	0.468	2.8	227.6	O K
5760 min Summer	9.399	0.399	2.8	189.7	O K
7200 min Summer	9.347	0.347	2.8	162.1	O K
8640 min Summer	9.305	0.305	2.8	140.5	O K
10080 min Summer	9.271	0.271	2.8	123.4	O K
15 min Winter	9.351	0.351	2.8	164.2	O K
30 min Winter	9.445	0.445	2.8	214.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	136.531	0.0	141.5	19
30 min Summer	89.782	0.0	184.4	34
60 min Summer	56.163	0.0	240.8	64
120 min Summer	34.492	0.0	295.4	124
180 min Summer	25.821	0.0	331.1	182
240 min Summer	20.923	0.0	357.0	242
360 min Summer	15.386	0.0	391.5	362
480 min Summer	12.246	0.0	412.2	482
600 min Summer	10.205	0.0	424.7	602
720 min Summer	8.767	0.0	431.0	720
960 min Summer	6.861	0.0	429.1	934
1440 min Summer	4.825	0.0	409.4	1152
2160 min Summer	3.385	0.0	527.5	1536
2880 min Summer	2.641	0.0	548.4	1956
4320 min Summer	1.884	0.0	585.1	2768
5760 min Summer	1.499	0.0	625.0	3520
7200 min Summer	1.270	0.0	661.7	4256
8640 min Summer	1.118	0.0	698.8	5008
10080 min Summer	1.012	0.0	736.2	5744
15 min Winter	136.531	0.0	158.2	19
30 min Winter	89.782	0.0	203.8	33



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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	9.535	0.535	2.8	266.1	O K
120 min Winter	9.627	0.627	2.8	320.8	O K
180 min Winter	9.679	0.679	2.8	353.9	O K
240 min Winter	9.714	0.714	2.8	375.9	Flood Risk
360 min Winter	9.752	0.752	2.9	401.0	Flood Risk
480 min Winter	9.768	0.768	2.9	411.8	Flood Risk
600 min Winter	9.773	0.773	2.9	415.2	Flood Risk
720 min Winter	9.772	0.772	2.9	414.2	Flood Risk
960 min Winter	9.758	0.758	2.9	404.9	Flood Risk
1440 min Winter	9.713	0.713	2.8	375.4	Flood Risk
2160 min Winter	9.653	0.653	2.8	337.1	O K
2880 min Winter	9.598	0.598	2.8	303.2	O K
4320 min Winter	9.498	0.498	2.8	244.4	O K
5760 min Winter	9.391	0.391	2.8	185.3	O K
7200 min Winter	9.309	0.309	2.8	142.4	O K
8640 min Winter	9.244	0.244	2.8	110.3	O K
10080 min Winter	9.196	0.196	2.8	87.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	56.163	0.0	269.6	64
120 min Winter	34.492	0.0	330.4	122
180 min Winter	25.821	0.0	369.7	180
240 min Winter	20.923	0.0	397.5	240
360 min Winter	15.386	0.0	431.7	356
480 min Winter	12.246	0.0	445.6	472
600 min Winter	10.205	0.0	446.3	586
720 min Winter	8.767	0.0	443.4	700
960 min Winter	6.861	0.0	435.8	922
1440 min Winter	4.825	0.0	418.2	1312
2160 min Winter	3.385	0.0	590.7	1644
2880 min Winter	2.641	0.0	614.0	2104
4320 min Winter	1.884	0.0	654.1	3024
5760 min Winter	1.499	0.0	700.1	3800
7200 min Winter	1.270	0.0	741.3	4472
8640 min Winter	1.118	0.0	783.0	5184
10080 min Winter	1.012	0.0	825.1	5848



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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	9.262	0.262	2.8	187.3	O K
30 min Summer	9.336	0.336	2.8	245.4	O K
60 min Summer	9.410	0.410	2.8	304.6	O K
120 min Summer	9.486	0.486	2.8	369.0	O K
180 min Summer	9.532	0.532	2.8	408.9	O K
240 min Summer	9.563	0.563	2.8	435.9	O K
360 min Summer	9.599	0.599	2.8	468.2	O K
480 min Summer	9.616	0.616	2.8	484.0	O K
600 min Summer	9.624	0.624	2.8	491.2	O K
720 min Summer	9.627	0.627	2.8	493.2	O K
960 min Summer	9.621	0.621	2.8	488.3	O K
1440 min Summer	9.594	0.594	2.8	463.6	O K
2160 min Summer	9.555	0.555	2.8	428.5	O K
2880 min Summer	9.522	0.522	2.8	400.2	O K
4320 min Summer	9.470	0.470	2.8	354.8	O K
5760 min Summer	9.421	0.421	2.8	314.5	O K
7200 min Summer	9.385	0.385	2.8	284.5	O K
8640 min Summer	9.356	0.356	2.8	260.7	O K
10080 min Summer	9.331	0.331	2.8	241.4	O K
15 min Winter	9.291	0.291	2.8	210.0	O K
30 min Winter	9.374	0.374	2.8	275.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	121.903	0.0	170.3	23
30 min Summer	80.162	0.0	215.5	38
60 min Summer	50.146	0.0	301.7	68
120 min Summer	30.797	0.0	367.3	126
180 min Summer	23.054	0.0	406.2	186
240 min Summer	18.681	0.0	428.5	246
360 min Summer	13.737	0.0	438.4	366
480 min Summer	10.934	0.0	434.2	484
600 min Summer	9.112	0.0	429.5	604
720 min Summer	7.828	0.0	424.7	724
960 min Summer	6.126	0.0	415.3	962
1440 min Summer	4.308	0.0	396.4	1370
2160 min Summer	3.022	0.0	667.0	1692
2880 min Summer	2.358	0.0	690.7	2076
4320 min Summer	1.682	0.0	718.0	2900
5760 min Summer	1.338	0.0	797.1	3680
7200 min Summer	1.134	0.0	843.9	4464
8640 min Summer	0.999	0.0	890.8	5192
10080 min Summer	0.903	0.0	937.3	5952
15 min Winter	121.903	0.0	189.2	23
30 min Winter	80.162	0.0	229.7	37




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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	9.454	0.454	2.8	342.1	O K
120 min Winter	9.539	0.539	2.8	414.7	O K
180 min Winter	9.590	0.590	2.8	459.9	O K
240 min Winter	9.624	0.624	2.8	490.8	O K
360 min Winter	9.665	0.665	2.8	528.5	O K
480 min Winter	9.685	0.685	2.8	547.6	O K
600 min Winter	9.695	0.695	2.8	557.1	O K
720 min Winter	9.699	0.699	2.8	560.9	O K
960 min Winter	9.697	0.697	2.8	558.3	O K
1440 min Winter	9.673	0.673	2.8	536.1	O K
2160 min Winter	9.625	0.625	2.8	492.2	O K
2880 min Winter	9.587	0.587	2.8	457.5	O K
4320 min Winter	9.519	0.519	2.8	397.1	O K
5760 min Winter	9.452	0.452	2.8	339.9	O K
7200 min Winter	9.390	0.390	2.8	288.6	O K
8640 min Winter	9.340	0.340	2.8	248.6	O K
10080 min Winter	9.299	0.299	2.8	216.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	50.146	0.0	336.9	66
120 min Winter	30.797	0.0	405.8	126
180 min Winter	23.054	0.0	437.7	184
240 min Winter	18.681	0.0	443.1	242
360 min Winter	13.737	0.0	439.1	360
480 min Winter	10.934	0.0	435.0	476
600 min Winter	9.112	0.0	431.3	592
720 min Winter	7.828	0.0	427.8	708
960 min Winter	6.126	0.0	420.8	936
1440 min Winter	4.308	0.0	406.6	1374
2160 min Winter	3.022	0.0	744.1	1776
2880 min Winter	2.358	0.0	766.9	2216
4320 min Winter	1.682	0.0	750.5	3152
5760 min Winter	1.338	0.0	892.9	4032
7200 min Winter	1.134	0.0	945.4	4824
8640 min Winter	0.999	0.0	998.3	5536
10080 min Winter	0.903	0.0	1051.0	6352

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 446317 295054 SP 46317 95054
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+25

Time Area Diagram

Total Area (ha) 0.830

Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)
0	4	0.415	4	8	0.415



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Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	666.0	0.300	780.3	0.600	903.7	0.900	1036.1
0.100	703.1	0.400	820.4	0.700	946.8	1.000	1082.2
0.200	741.2	0.500	861.5	0.800	990.9		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0084-2800-0700-2800
Design Head (m)	0.700
Design Flow (l/s)	2.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	84
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	2.8
Flush-Flo™	0.210	2.8
Kick-Flo®	0.462	2.3
Mean Flow over Head Range	-	2.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	3.6	3.000	5.5	7.000	8.2
0.200	2.8	1.400	3.8	3.500	5.9	7.500	8.5
0.300	2.7	1.600	4.1	4.000	6.3	8.000	8.7
0.400	2.6	1.800	4.3	4.500	6.6	8.500	9.0
0.500	2.4	2.000	4.5	5.000	7.0	9.000	9.3
0.600	2.6	2.200	4.7	5.500	7.3	9.500	9.5
0.800	3.0	2.400	4.9	6.000	7.6		
1.000	3.3	2.600	5.1	6.500	7.9		

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	9.291	0.291	2.8	210.0	O K
30 min Summer	9.374	0.374	2.8	275.3	O K
60 min Summer	9.455	0.455	2.8	342.1	O K
120 min Summer	9.539	0.539	2.8	414.7	O K
180 min Summer	9.590	0.590	2.8	459.7	O K
240 min Summer	9.623	0.623	2.8	490.4	O K
360 min Summer	9.664	0.664	2.8	527.8	O K
480 min Summer	9.684	0.684	2.8	546.6	O K
600 min Summer	9.694	0.694	2.8	555.7	O K
720 min Summer	9.697	0.697	2.8	559.1	O K
960 min Summer	9.694	0.694	2.8	555.6	O K
1440 min Summer	9.668	0.668	2.8	531.3	O K
2160 min Summer	9.627	0.627	2.8	493.3	O K
2880 min Summer	9.594	0.594	2.8	463.4	O K
4320 min Summer	9.543	0.543	2.8	418.7	O K
5760 min Summer	9.503	0.503	2.8	383.7	O K
7200 min Summer	9.470	0.470	2.8	355.4	O K
8640 min Summer	9.438	0.438	2.8	328.4	O K
10080 min Summer	9.413	0.413	2.8	307.1	O K
15 min Winter	9.324	0.324	2.8	235.5	O K
30 min Winter	9.415	0.415	2.8	308.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	136.531	0.0	189.2	23
30 min Summer	89.782	0.0	229.6	38
60 min Summer	56.163	0.0	336.9	68
120 min Summer	34.492	0.0	405.8	126
180 min Summer	25.821	0.0	437.6	186
240 min Summer	20.923	0.0	443.0	246
360 min Summer	15.386	0.0	439.1	366
480 min Summer	12.246	0.0	435.1	484
600 min Summer	10.205	0.0	431.5	604
720 min Summer	8.767	0.0	428.1	724
960 min Summer	6.861	0.0	421.1	962
1440 min Summer	4.825	0.0	406.5	1426
2160 min Summer	3.385	0.0	743.9	1732
2880 min Summer	2.641	0.0	766.1	2108
4320 min Summer	1.884	0.0	737.5	2940
5760 min Summer	1.499	0.0	892.8	3752
7200 min Summer	1.270	0.0	945.1	4608
8640 min Summer	1.118	0.0	998.0	5368
10080 min Summer	1.012	0.0	1050.4	6152
15 min Winter	136.531	0.0	208.3	23
30 min Winter	89.782	0.0	233.4	37



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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	9.504	0.504	2.8	384.0	O K
120 min Winter	9.596	0.596	2.8	465.8	O K
180 min Winter	9.652	0.652	2.8	516.9	O K
240 min Winter	9.690	0.690	2.8	552.1	O K
360 min Winter	9.736	0.736	2.9	595.6	Flood Risk
480 min Winter	9.759	0.759	2.9	618.2	Flood Risk
600 min Winter	9.771	0.771	2.9	630.1	Flood Risk
720 min Winter	9.777	0.777	2.9	635.5	Flood Risk
960 min Winter	9.776	0.776	2.9	634.8	Flood Risk
1440 min Winter	9.755	0.755	2.9	614.0	Flood Risk
2160 min Winter	9.708	0.708	2.8	568.9	Flood Risk
2880 min Winter	9.669	0.669	2.8	532.1	O K
4320 min Winter	9.603	0.603	2.8	472.2	O K
5760 min Winter	9.547	0.547	2.8	421.4	O K
7200 min Winter	9.497	0.497	2.8	377.8	O K
8640 min Winter	9.444	0.444	2.8	333.1	O K
10080 min Winter	9.397	0.397	2.8	294.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	56.163	0.0	374.7	66
120 min Winter	34.492	0.0	438.4	126
180 min Winter	25.821	0.0	445.6	184
240 min Winter	20.923	0.0	443.8	242
360 min Winter	15.386	0.0	441.2	360
480 min Winter	12.246	0.0	439.7	476
600 min Winter	10.205	0.0	438.3	594
720 min Winter	8.767	0.0	436.9	710
960 min Winter	6.861	0.0	433.9	938
1440 min Winter	4.825	0.0	426.7	1384
2160 min Winter	3.385	0.0	823.8	1976
2880 min Winter	2.641	0.0	829.1	2228
4320 min Winter	1.884	0.0	764.5	3160
5760 min Winter	1.499	0.0	999.9	4088
7200 min Winter	1.270	0.0	1058.4	4976
8640 min Winter	1.118	0.0	1117.8	5800
10080 min Winter	1.012	0.0	1177.5	6560

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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	9.051	0.551	2.7	146.4	O K
30 min Summer	9.180	0.680	2.7	191.5	O K
60 min Summer	9.298	0.798	2.7	236.9	O K
120 min Summer	9.413	0.913	2.7	284.6	O K
180 min Summer	9.478	0.978	2.7	313.2	O K
240 min Summer	9.519	1.019	2.7	332.0	O K
360 min Summer	9.563	1.063	2.7	352.7	O K
480 min Summer	9.579	1.079	2.7	360.6	O K
600 min Summer	9.582	1.082	2.7	361.9	O K
720 min Summer	9.577	1.077	2.7	359.3	O K
960 min Summer	9.552	1.052	2.7	347.5	O K
1440 min Summer	9.494	0.994	2.7	320.5	O K
2160 min Summer	9.422	0.922	2.7	288.3	O K
2880 min Summer	9.364	0.864	2.7	263.6	O K
4320 min Summer	9.269	0.769	2.7	225.2	O K
5760 min Summer	9.181	0.681	2.7	191.8	O K
7200 min Summer	9.094	0.594	2.7	161.1	O K
8640 min Summer	9.026	0.526	2.7	138.2	O K
10080 min Summer	8.971	0.471	2.7	120.7	O K
15 min Winter	9.103	0.603	2.7	164.2	O K
30 min Winter	9.242	0.742	2.7	215.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	121.903	0.0	146.1	19
30 min Summer	80.162	0.0	190.2	34
60 min Summer	50.146	0.0	243.4	64
120 min Summer	30.797	0.0	298.7	124
180 min Summer	23.054	0.0	335.1	182
240 min Summer	18.681	0.0	361.5	242
360 min Summer	13.737	0.0	396.6	362
480 min Summer	10.934	0.0	415.5	482
600 min Summer	9.112	0.0	420.7	602
720 min Summer	7.828	0.0	419.7	720
960 min Summer	6.126	0.0	413.9	960
1440 min Summer	4.308	0.0	397.6	1180
2160 min Summer	3.022	0.0	529.7	1556
2880 min Summer	2.358	0.0	550.9	1960
4320 min Summer	1.682	0.0	588.7	2768
5760 min Summer	1.338	0.0	626.1	3632
7200 min Summer	1.134	0.0	663.0	4328
8640 min Summer	0.999	0.0	700.5	5024
10080 min Summer	0.903	0.0	738.8	5752
15 min Winter	121.903	0.0	163.4	19
30 min Winter	80.162	0.0	207.6	33




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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	9.369	0.869	2.7	266.0	O K
120 min Winter	9.494	0.994	2.7	320.5	O K
180 min Winter	9.565	1.065	2.7	353.6	O K
240 min Winter	9.610	1.110	2.7	375.5	O K
360 min Winter	9.660	1.160	2.8	400.7	O K
480 min Winter	9.681	1.181	2.8	411.5	O K
600 min Winter	9.688	1.188	2.8	414.8	O K
720 min Winter	9.686	1.186	2.8	413.9	O K
960 min Winter	9.668	1.168	2.8	404.4	O K
1440 min Winter	9.607	1.107	2.7	374.2	O K
2160 min Winter	9.523	1.023	2.7	333.7	O K
2880 min Winter	9.449	0.949	2.7	300.4	O K
4320 min Winter	9.319	0.819	2.7	245.1	O K
5760 min Winter	9.187	0.687	2.7	194.3	O K
7200 min Winter	9.044	0.544	2.7	144.4	O K
8640 min Winter	8.938	0.438	2.7	110.5	O K
10080 min Winter	8.854	0.354	2.7	85.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	50.146	0.0	272.5	64
120 min Winter	30.797	0.0	334.3	122
180 min Winter	23.054	0.0	374.4	180
240 min Winter	18.681	0.0	402.4	240
360 min Winter	13.737	0.0	427.1	356
480 min Winter	10.934	0.0	428.0	472
600 min Winter	9.112	0.0	426.1	588
720 min Winter	7.828	0.0	423.5	700
960 min Winter	6.126	0.0	417.9	924
1440 min Winter	4.308	0.0	405.4	1338
2160 min Winter	3.022	0.0	593.2	1660
2880 min Winter	2.358	0.0	616.9	2108
4320 min Winter	1.682	0.0	658.5	3024
5760 min Winter	1.338	0.0	701.3	3920
7200 min Winter	1.134	0.0	742.6	4608
8640 min Winter	0.999	0.0	784.7	5272
10080 min Winter	0.903	0.0	827.6	5944

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Rainfall Details


Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 446317 295054 SP 46317 95054
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+25

Time Area Diagram

Total Area (ha) 0.650

<b>Time (mins)</b>		<b>Area</b>
<b>From:</b>	<b>To:</b>	<b>(ha)</b>
0	4	0.650



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Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 8.500

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	205.0	0.400	294.3	0.800	399.6	1.200	521.0
0.100	225.8	0.500	319.1	0.900	428.4	1.300	553.9
0.200	247.6	0.600	344.9	1.000	458.3	1.400	587.8
0.300	270.4	0.700	371.7	1.100	489.1	1.500	622.6

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0077-2800-1200-2800
Design Head (m)	1.200
Design Flow (l/s)	2.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	77
Invert Level (m)	8.500
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	2.8
Flush-Flo™	0.336	2.7
Kick-Flo®	0.683	2.2
Mean Flow over Head Range	-	2.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.1	1.200	2.8	3.000	4.3	7.000	6.4
0.200	2.6	1.400	3.0	3.500	4.6	7.500	6.6
0.300	2.7	1.600	3.2	4.000	4.9	8.000	6.8
0.400	2.7	1.800	3.4	4.500	5.2	8.500	7.0
0.500	2.6	2.000	3.5	5.000	5.4	9.000	7.2
0.600	2.4	2.200	3.7	5.500	5.7	9.500	7.3
0.800	2.3	2.400	3.8	6.000	5.9		
1.000	2.6	2.600	4.0	6.500	6.1		

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	9.103	0.603	2.7	164.3	O K
30 min Summer	9.242	0.742	2.7	215.0	O K
60 min Summer	9.369	0.869	2.7	266.0	O K
120 min Summer	9.493	0.993	2.7	320.1	O K
180 min Summer	9.563	1.063	2.7	352.9	O K
240 min Summer	9.608	1.108	2.7	374.6	O K
360 min Summer	9.657	1.157	2.7	399.3	O K
480 min Summer	9.678	1.178	2.8	409.5	O K
600 min Summer	9.683	1.183	2.8	412.3	O K
720 min Summer	9.680	1.180	2.8	410.7	O K
960 min Summer	9.659	1.159	2.7	399.9	O K
1440 min Summer	9.600	1.100	2.7	370.8	O K
2160 min Summer	9.527	1.027	2.7	335.6	O K
2880 min Summer	9.469	0.969	2.7	309.2	O K
4320 min Summer	9.379	0.879	2.7	270.0	O K
5760 min Summer	9.305	0.805	2.7	239.5	O K
7200 min Summer	9.241	0.741	2.7	214.4	O K
8640 min Summer	9.176	0.676	2.7	190.1	O K
10080 min Summer	9.111	0.611	2.7	166.9	O K
15 min Winter	9.160	0.660	2.7	184.2	O K
30 min Winter	9.309	0.809	2.7	241.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	136.531	0.0	163.4	19
30 min Summer	89.782	0.0	207.6	34
60 min Summer	56.163	0.0	272.5	64
120 min Summer	34.492	0.0	334.3	124
180 min Summer	25.821	0.0	374.4	184
240 min Summer	20.923	0.0	402.5	242
360 min Summer	15.386	0.0	427.7	362
480 min Summer	12.246	0.0	428.9	482
600 min Summer	10.205	0.0	427.3	602
720 min Summer	8.767	0.0	424.9	722
960 min Summer	6.861	0.0	419.4	960
1440 min Summer	4.825	0.0	406.6	1214
2160 min Summer	3.385	0.0	593.2	1580
2880 min Summer	2.641	0.0	616.9	1988
4320 min Summer	1.884	0.0	658.0	2808
5760 min Summer	1.499	0.0	701.2	3632
7200 min Summer	1.270	0.0	742.6	4464
8640 min Summer	1.118	0.0	784.6	5272
10080 min Summer	1.012	0.0	827.5	5952
15 min Winter	136.531	0.0	182.2	19
30 min Winter	89.782	0.0	212.1	34



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

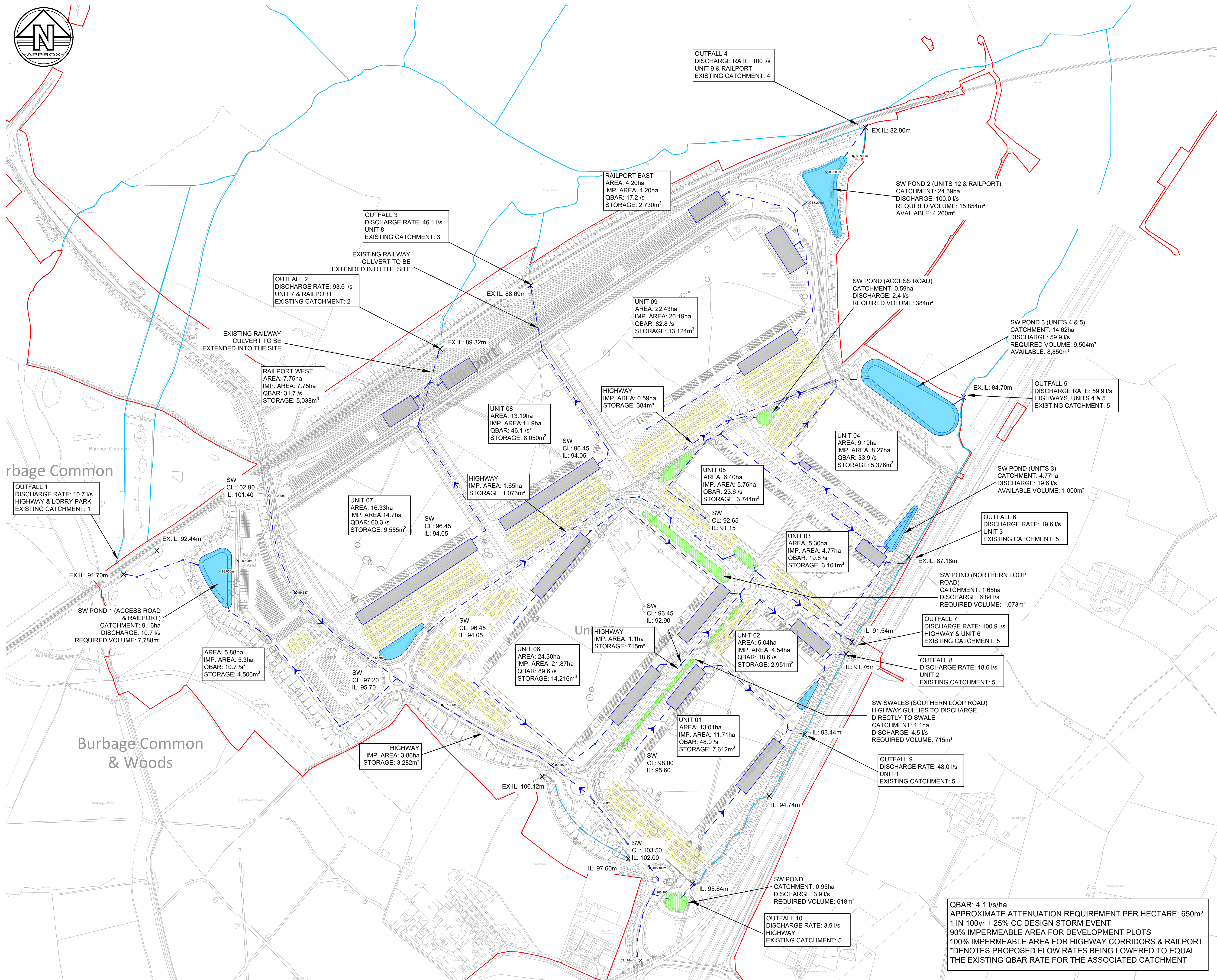
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	9.445	0.945	2.7	298.6	O K
120 min Winter	9.579	1.079	2.7	360.4	O K
180 min Winter	9.655	1.155	2.7	398.1	O K
240 min Winter	9.705	1.205	2.8	423.5	Flood Risk
360 min Winter	9.760	1.260	2.9	453.2	Flood Risk
480 min Winter	9.785	1.285	2.9	466.7	Flood Risk
600 min Winter	9.795	1.295	2.9	471.9	Flood Risk
720 min Winter	9.795	1.295	2.9	472.1	Flood Risk
960 min Winter	9.780	1.280	2.9	464.0	Flood Risk
1440 min Winter	9.725	1.225	2.8	434.2	Flood Risk
2160 min Winter	9.639	1.139	2.7	390.2	O K
2880 min Winter	9.569	1.069	2.7	355.4	O K
4320 min Winter	9.447	0.947	2.7	299.3	O K
5760 min Winter	9.338	0.838	2.7	252.8	O K
7200 min Winter	9.235	0.735	2.7	212.1	O K
8640 min Winter	9.108	0.608	2.7	165.9	O K
10080 min Winter	9.006	0.506	2.7	131.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	56.163	0.0	305.1	64
120 min Winter	34.492	0.0	373.5	122
180 min Winter	25.821	0.0	415.3	180
240 min Winter	20.923	0.0	431.5	240
360 min Winter	15.386	0.0	434.0	356
480 min Winter	12.246	0.0	433.3	474
600 min Winter	10.205	0.0	432.2	590
720 min Winter	8.767	0.0	431.1	702
960 min Winter	6.861	0.0	428.4	926
1440 min Winter	4.825	0.0	422.9	1354
2160 min Winter	3.385	0.0	664.2	1684
2880 min Winter	2.641	0.0	690.6	2136
4320 min Winter	1.884	0.0	731.0	3064
5760 min Winter	1.499	0.0	785.4	3928
7200 min Winter	1.270	0.0	831.8	4824
8640 min Winter	1.118	0.0	878.9	5536
10080 min Winter	1.012	0.0	927.0	6160

## APPENDICES

### Appendix 9: Concept Drainage Strategy Plans





- Notes**
- Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
  - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer immediately.
  - Drawing provided for illustrative purposes only. Design subject to further coordination and approvals.
  - Layout based on AJA drawing: 5905-177.
  - Attenuation indicatively sized for the 1 in 100 year storm event plus a 25% allowance for climate change for the estimated impermeable areas. Allowance made for 650m<sup>3</sup> storage per 1ha of impermeable area. To be agreed with the LLFA.
  - Equivalent greenfield runoff rates have been estimate to be 4.1 l/s/ha. To be agreed with the LLFA.
  - Foul water connection and site wide pumping requirements to be discussed and agreed with Severn Trent Water.

- Legend**
- APPLICATION BOUNDARY
  - EXISTING WATERCOURSE
  - PROPOSED WATERCOURSE DIVERSION
  - INDICATIVE SURFACE WATER DRAINAGE RUN
  - ABOVE GROUND ATTENUATION FEATURE
  - HIGHWAY SWALE/ATTENUATION
  - BELOW GROUND ATTENUATION FEATURE
  - PERMEABLE PAVING AND SUB-BASE STORAGE

P04	05.09.22	Updated climate change allowance	LR	RJ
P03	14.12.21	Updated DCO boundary	RJ	CD
P02	30.09.21	Updated to latest masterplan	RJ	CD
P01	25.05.21	Preliminary Issue	RJ	CD
Rev	Date	Details of issue / revision	Drw	Rev

**Issues & Revisions**

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Client  
**TRITAX SYMMETRY**

Project Title  
**HINCKLEY RAIL FREIGHT INTERCHANGE**

Drawing Title  
**CONCEPT DRAINAGE STRATEGY PLAN**

Drawn:	RJ	Reviewed:	CD
BWB Ref:	NTT 2814	Date:	25.05.21
Scale:	@A1: 1:4000		

Drawing Status  
**PRELIMINARY**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HRF-BWB-EWE-ZZ-DR-CD-00502	S2	P04

QBAR: 4.1 l/s/ha  
APPROXIMATE ATTENUATION REQUIREMENT PER HECTARE: 650m<sup>3</sup>  
1 IN 100yr + 25% CC DESIGN STORM EVENT  
90% IMPERMEABLE AREA FOR DEVELOPMENT PLOTS  
100% IMPERMEABLE AREA FOR HIGHWAY CORRIDORS & RAILPORT  
\*DENOTES PROPOSED FLOW RATES BEING LOWERED TO EQUAL THE EXISTING QBAR RATE FOR THE ASSOCIATED CATCHMENT





EXISTING WATERCOURSE TO BE CULVERTED BENEATH THE PROPOSED HIGHWAY. LINE, LEVEL AND SIZE TO BE CONFIRMED VIA ADDITIONAL SURVEYS & HYDRAULIC MODELLING. DIMENSIONS: 2.1 X 1m (APPROX.) EX. IL: 90.00 (APPROX.)

SW  
CL: 92.20  
IL: 91.30

APPROX. IL: 89.7  
TOB: 90.8

REDUCED COVER DRAINAGE TO PASS OVER CULVERT

SW  
CL: 93.20  
IL: 91.70

APPROX. IL: 90.6  
TOB: 92.30

CULVERTS TO ACCOMMODATE EXISTING FLOW PATH. DIMENSIONS TBC

SW POND 1 (LINK ROAD SOUTH)  
CATCHMENT: 0.65ha  
DISCHARGE: 2.8 l/s\*  
REQUIRED VOLUME: 415m<sup>3</sup> + 300mm FREEBOARD  
CL: 92.30  
IL: 90.80

SW  
CL: 93.80  
IL: 92.30

EXISTING WATERCOURSE TO BE CULVERTED BENEATH THE PROPOSED HIGHWAY. LINE, LEVEL AND SIZE TO BE CONFIRMED VIA ADDITIONAL SURVEYS & HYDRAULIC MODELLING. DIMENSIONS: 2.1 X 1m (APPROX.) EX. IL: 90.60 (APPROX.)

SW  
CL: 97.70  
IL: 96.20

DRAINAGE TBC

SW  
CL: 103.2  
IL: 101.7



SW POND 3 (LINK ROAD NORTH)  
CATCHMENT: 0.83ha  
DISCHARGE: 2.8 l/s\*  
REQUIRED VOLUME: 560m<sup>3</sup> + 300mm FREEBOARD  
CL: 92.50  
IL: 91.50

SW  
CL: 94.30  
IL: 92.80

APPROX. IL: 91.45  
TOB: 91.24

SW  
CL: 93.00  
IL: 91.65

EXISTING WATERCOURSE TO BE CULVERTED BENEATH THE PROPOSED HIGHWAY. LINE, LEVEL AND SIZE TO BE CONFIRMED VIA ADDITIONAL SURVEYS & HYDRAULIC MODELLING. DIMENSIONS: 2.1 X 1m (APPROX.) EX. IL: 91.05 (APPROX.)

SW  
CL: 92.70  
IL: 91.20

SW POND 2 (LINK ROAD CENTRAL)  
CATCHMENT: 0.58ha  
DISCHARGE: 2.8 l/s\*  
REQUIRED VOLUME: 365m<sup>3</sup> + 300mm FREEBOARD  
CL: 90.80  
IL: 89.80

SW  
CL: 91.90  
IL: 90.20

APPROX. IL: 89.7  
TOB: 90.8

EXISTING WATERCOURSE TO BE CULVERTED BENEATH THE PROPOSED HIGHWAY. LINE, LEVEL AND SIZE TO BE CONFIRMED VIA ADDITIONAL SURVEYS & HYDRAULIC MODELLING. DIMENSIONS: 2.1 X 1m (APPROX.) EX. IL: 90.00 (APPROX.)

SW  
CL: 92.20  
IL: 91.30

Notes

- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.
- Drawing provided for illustrative purposes only. Design subject to further coordination and approvals.
- Layout based on AJA drawing: 5905-177.
- Attenuation indicatively sized for the 1 in 100 year storm event plus a 25% allowance for climate change for the estimated impermeable areas.
- Equivalent greenfield runoff rates have been estimate to be 4.1 l/s/ha. To be agreed with the LLFA.
- Foul water connection and site wide pumping requirements to be discussed and agreed with Severn Trent Water.

Legend

- APPLICATION BOUNDARY
- EXISTING WATERCOURSE
- PROPOSED CULVERT
- INDICATIVE SURFACE WATER DRAINAGE RUN
- ABOVE GROUND ATTENUATION FEATURE
- MEASURED IMPERMEABLE AREA

REFER TO BWB WATERCOURSE SURVEY DRAWINGS FOR FURTHER DETAILS OF THE EXISTING CHANNELS. 'HNRFI-BWB-00-00-M2-G-0060' SERIES. FURTHER SURVEYS REQUIRED TO INFORM LEVELS DESIGN. PROPOSED DISCHARGE RATES SPLIT EVENLY BETWEEN THE THREE CATCHMENTS TO AVOID SMALL DISCHARGE RATES. TOTAL IMPERMEABLE AREA: 2.06ha GREENFIELD RUNOFF: 4.1 l/s/ha (QBAR) TOTAL RUNOFF: 8.4 l/s

P03	05.09.22	Updated CC allowances	RJ	CD
P02	14.12.21	Updated to latest highways GA	RJ	CD
P01	22.07.21	Preliminary Issue	RJ	CD
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

**BWB**  
A CAF GROUP COMPANY

- Birmingham | 0121 233 3322
- Leeds | 0113 233 8000
- London | 020 7407 3879
- Manchester | 0161 233 4260
- Nottingham | 0115 924 1100

www.bwbconsulting.com

Client  
**TRITAX SYMMETRY**

Project Title  
**HINCKLEY RAIL FREIGHT INTERCHANGE**

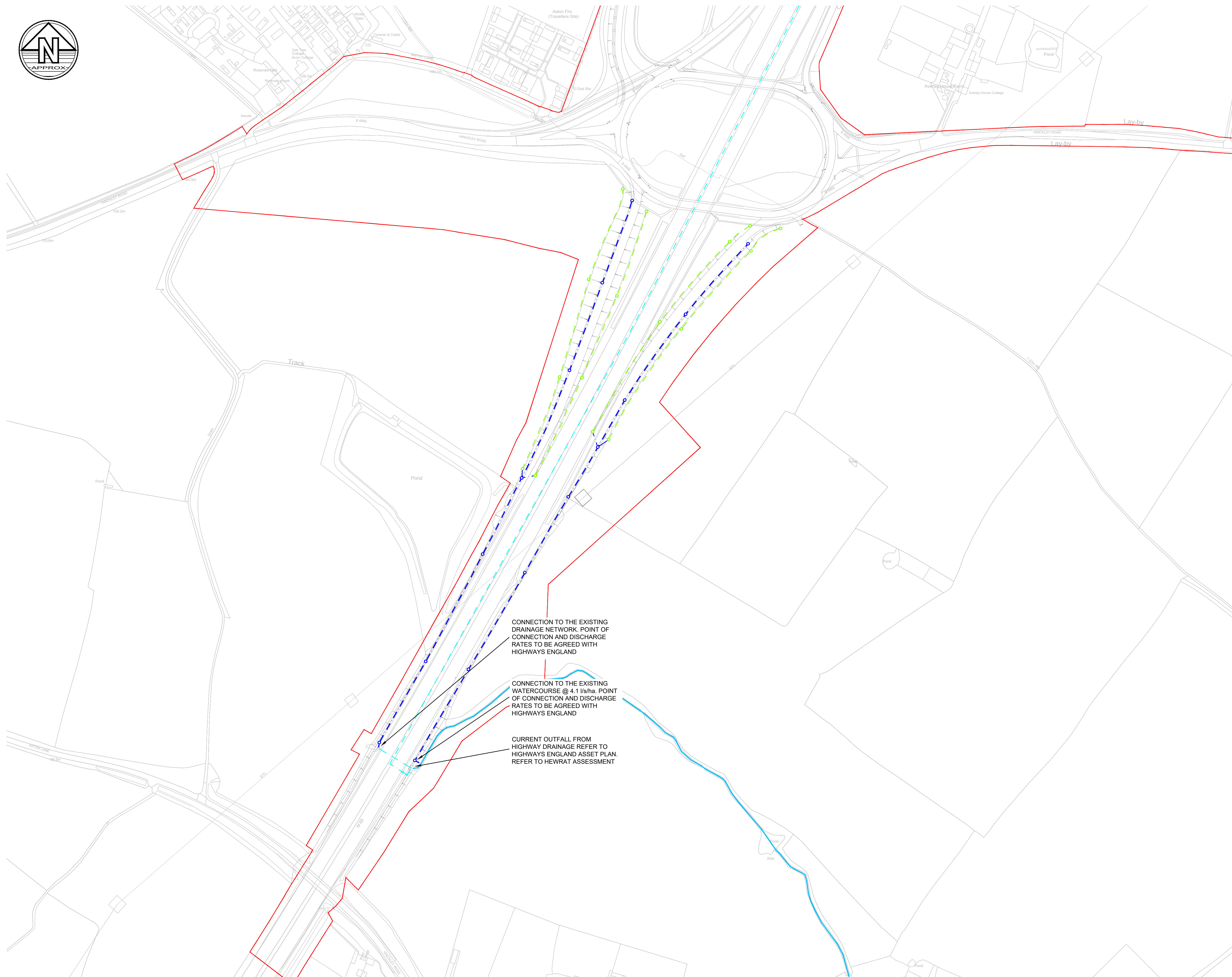
Drawing Title  
**LINK ROAD DRAINAGE STRATEGY PLAN**

Drawn:	RJ	Reviewed:	CD
BWB Ref:	NTT 2814	Date:	22.07.21
Scale:	@A1:	Scale:	1:1000

Drawing Status  
**PRELIMINARY**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HRF-BWB-EWE-D1-DR-CD-00501	S2	P03





CONNECTION TO THE EXISTING DRAINAGE NETWORK. POINT OF CONNECTION AND DISCHARGE RATES TO BE AGREED WITH HIGHWAYS ENGLAND

CONNECTION TO THE EXISTING WATERCOURSE @ 4.1 l/s/ha. POINT OF CONNECTION AND DISCHARGE RATES TO BE AGREED WITH HIGHWAYS ENGLAND

CURRENT OUTFALL FROM HIGHWAY DRAINAGE REFER TO HIGHWAYS ENGLAND ASSET PLAN. REFER TO HEWRAT ASSESSMENT

**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. Drawing provided for illustrative purposes only. Design subject to further coordination and approvals.
6. Layout based on AJA drawing: 5905-177.
7. Attenuation indicatively sized for the 1 in 100 year storm event plus a 20% allowance for climate change for the estimated impermeable areas. Allowance made for 650m<sup>3</sup> storage per 1ha of impermeable area. To be agreed with the LLFA.
8. Equivalent greenfield runoff rates have been estimate to be 4.1 l/s/ha. To be agreed with the LLFA.
9. Existing drainage shown indicatively for illustrative purposes. point of connection and proposed discharge rates to be agreed with Highways England.

**Legend**

- APPLICATION BOUNDARY
- EXISTING WATERCOURSE
- - - EXISTING DRAINAGE
- - - INDICATIVE SURFACE WATER FILTER DRAIN TO SERVE PROPOSED HARD SURFACING
- - - INDICATIVE SURFACE WATER FILTER DRAIN TO SERVE PROPOSED EMBANKMENTS

P01	05.09.22	Preliminary Issue	RJ	CD
Rev	Date	Details of issue / revision	Drw	Rev

**Issues & Revisions**

Birmingham | 0121 233 3322  
 Leeds | 0113 233 8000  
 London | 020 7407 3879  
 Manchester | 0161 233 4260  
 Nottingham | 0115 924 1100  
[www.bwbconsulting.com](http://www.bwbconsulting.com)

Client  
**TRITAX SYMMETRY**

Project Title  
**HINCKLEY RAIL FREIGHT INTERCHANGE**

Drawing Title  
**M69 JUNCTION 2 DRAINAGE STRATEGY PLAN**

Drawn:	RJ	Reviewed:	CD
BWB Ref:	NTT 2814	Date:	05.09.22
Scale@A1:	1:2000		

Drawing Status  
**PRELIMINARY**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HRF-BWB-EWE-ZZ-DR-CD-00505	S2	P01

## APPENDICES

### Appendix 10: HEWRAT



Soluble			Sediment - Chronic Impact	
EQS - Annual Average Concentration			Acute Impact	
	Copper	Zinc	Copper	Zinc
Step 2	Tier 1 fail. Go to Tier 2 (using UK TAG M-BAT tool), or Step 3 mitigation.	Tier 1 fail. Go to Tier 2 (using UK TAG M-BAT tool), or Step 3 mitigation.	Runoff Fails Toxicity Test. Try River Impact.	Runoff Fails Toxicity Test. Try River Impact.
Step 3	-	-		
		ug/l		
		ug/l		

Runoff Fails Toxicity Test. Try River Impact.

Sediment deposition for this site is judged as:  
 Accumulating?  -  - Low flow Vel m/s  
 Extensive?  -  - Deposition Index

Road number	M69		HE Area / DBFO number	
Assessment type	Non-cumulative assessment (single outfall)			
OS grid reference of assessment point (m)	Easting	446310	Northing	293640
OS grid reference of outfall structure (m)	Easting	446050	Northing	293100
Outfall number	SP4693 0609c		List of outfalls in cumulative assessment	
Receiving watercourse	UOW associated with Lower Soar			
EA receiving water Detailed River Network ID			Assessor and affiliation	
Date of assessment			Version of assessment	
Notes				

**Step 1 Runoff Quality**

AADT  Climatic region  Rainfall site

**Step 2 River Impacts**

Annual Q<sub>95</sub> river flow (m<sup>3</sup>/s)  Freshwater EQS limits:  
 Bioavailable dissolved copper (µg/l)   D  
 Bioavailable dissolved zinc (µg/l)   D  
 Impermeable road area drained (ha)   
 Permeable area draining to outfall (ha)   
 Base Flow Index (BFI)   D  
 Is the discharge in or within 1 km upstream of a protected site for conservation?   D

**For dissolved zinc only** Water hardness   D  
**For dissolved copper only** Ambient background concentration (µg/l)   D

**For sediment impact only** Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?   D  
 Tier 1 Estimated river width (m)   
 Tier 2 Bed width (m)  Manning's n   D Side slope (m/m)  Long slope (m/m)

**Step 3 Mitigation**

	Brief description	Estimated effectiveness		
		Treatment for solubles (%)	Attenuation for solubles - restricted discharge rate (l/s)	Settlement of sediments (%)
Existing measures		<input type="text" value="0"/> <input type="checkbox"/> D	No restriction <input type="text" value=""/> <input type="checkbox"/> D	<input type="text" value="0"/> <input type="checkbox"/> D
Proposed measures		<input type="text" value="0"/> <input type="checkbox"/> D	No restriction <input type="text" value=""/> <input type="checkbox"/> D	<input type="text" value="0"/> <input type="checkbox"/> D

Soluble				Sediment - Chronic Impact	
EQS - Annual Average Concentration				Acute Impact	
	Copper	Zinc	ug/l	Copper	Zinc
Step 2	0.18	0.45	ug/l	Pass	Pass
Step 3	-	-	ug/l		

**Fail. Try Tier 2 for Velocity**

Settlement needed = 33 %, proposed = 0 %

Sediment deposition for this site is judged as:

Accumulating?	Yes	0.00	Low flow Vel m/s
Extensive?	Yes	149	Deposition Index

Road number	M69		HE Area / DBFO number	
Assessment type	Non-cumulative assessment (single outfall)			
OS grid reference of assessment point (m)	Easting	446310	Northing	293640
OS grid reference of outfall structure (m)	Easting	446050	Northing	293100
Outfall number	SP4693 0609c		List of outfalls in cumulative assessment	
Receiving watercourse	UOW associated with Lower Soar			
EA receiving water Detailed River Network ID			Assessor and affiliation	
Date of assessment			Version of assessment	
Notes				

**Step 1 Runoff Quality**

AADT  Climatic region  Rainfall site

**Step 2 River Impacts**

Annual Q<sub>95</sub> river flow (m<sup>3</sup>/s)

(Enter zero in Annual Q<sub>95</sub> river flow box to assess Step 1 runoff quality only)

Impermeable road area drained (ha)

Permeable area draining to outfall (ha)

Base Flow Index (BFI)

Freshwater EQS limits:

Bioavailable dissolved copper (µg/l)

Bioavailable dissolved zinc (µg/l)

Is the discharge in or within 1 km upstream of a protected site for conservation?

**For dissolved zinc only** Water hardness

**For dissolved copper only** Ambient background concentration (µg/l)

**For sediment impact only** Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?

Tier 1 Estimated river width (m)

Tier 2 Bed width (m)  Manning's n   Side slope (m/m)  Long slope (m/m)

**Step 3 Mitigation**

	Brief description	Estimated effectiveness		
		Treatment for solubles (%)	Attenuation for solubles - restricted discharge rate (l/s)	Settlement of sediments (%)
Existing measures		<input type="text" value="0"/> <input type="button" value="D"/>	No restriction <input type="text" value=""/> <input type="button" value="D"/>	<input type="text" value="0"/> <input type="button" value="D"/>
Proposed measures		<input type="text" value="0"/> <input type="button" value="D"/>	No restriction <input type="text" value=""/> <input type="button" value="D"/>	<input type="text" value="0"/> <input type="button" value="D"/>



Soluble				Acute Impact		Sediment - Chronic Impact	
EQS - Annual Average Concentration							
	Copper	Zinc	ug/l	Copper	Zinc	Pass	
Step 2	0.18	0.45	ug/l	Pass	Pass	Sediment deposition for this site is judged as:	
Step 3	-	-	ug/l			Accumulating?	No 0.11 Low flow Vel m/s
						Extensive?	No - Deposition Index

Road number	M69	HE Area / DBFO number	
Assessment type	Non-cumulative assessment (single outfall)		
OS grid reference of assessment point (m)	Easting 446310	Northing	293640
OS grid reference of outfall structure (m)	Easting 446050	Northing	293100
Outfall number	SP4693 0609c	List of outfalls in cumulative assessment	
Receiving watercourse	UOW associated with Lower Soar		
EA receiving water Detailed River Network ID		Assessor and affiliation	
Date of assessment		Version of assessment	
Notes			

**Step 1 Runoff Quality**

AADT  Climatic region  Rainfall site

**Step 2 River Impacts**

Annual Q<sub>95</sub> river flow (m<sup>3</sup>/s)  Freshwater EQS limits:

(Enter zero in Annual Q<sub>95</sub> river flow box to assess Step 1 runoff quality only)

Impermeable road area drained (ha)  Bioavailable dissolved copper (µg/l)

Permeable area draining to outfall (ha)  Bioavailable dissolved zinc (µg/l)

Base Flow Index (BFI)   Is the discharge in or within 1 km upstream of a protected site for conservation?

**For dissolved zinc only** Water hardness   **For dissolved copper only** Ambient background concentration (µg/l)

**For sediment impact only** Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?

Tier 1 Estimated river width (m)

Tier 2 Bed width (m)  Manning's n   Side slope (m/m)  Long slope (m/m)

**Step 3 Mitigation**

	Brief description	Estimated effectiveness		
		Treatment for solubles (%)	Attenuation for solubles - restricted discharge rate (l/s)	Settlement of sediments (%)
Existing measures		<input type="text" value="0"/> <input type="button" value="D"/>	No restriction <input type="text" value="No restriction"/> <input type="button" value="D"/>	<input type="text" value="0"/> <input type="button" value="D"/>
Proposed measures		<input type="text" value="0"/> <input type="button" value="D"/>	No restriction <input type="text" value="No restriction"/> <input type="button" value="D"/>	<input type="text" value="0"/> <input type="button" value="D"/>

### Assessment of Priority Outfalls

#### Method D - assessment of risk from accidental spillage

		Additional columns for use if other roads drain to the same outfall							
		A (main road)	B	C	D	E	F		
D1	Water body type	Surface watercourse							
D2	Length of road draining to outfall (m)	700							
D3	Road Type (A-road or Motorway)	M							
D4	If A road, is site urban or rural?								
D5	Junction type	Slip road							
D6	Location (response time for emergency services)	< 20 minutes							
D7	Traffic flow (AADT two way)	28,021							
D8	% HGV	40							
D8	Spillage factor (no/10 <sup>9</sup> HGVkm/year)	0.43							
D9	Risk of accidental spillage	0.00123	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
D10	Probability factor	0.45							
D11	Risk of pollution incident	0.00055	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
D12	Is risk greater than 0.01?	No							
D13	Return period without pollution reduction measures	0.00055	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Totals
D14	Existing measures factor	1							Return Period (years)
D15	Return period with existing pollution reduction measures	0.00055	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0006
D16	Proposed measures factor	1							1805
D17	Residual with proposed Pollution reduction measures	0.00055	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0006
									1805

#### Justification for choice of existing measures factors:

#### Justification for choice of proposed measures factors:

#### Spillage Factor

		Serious Accidental Spillages (Billion HGV km/ year)		
		Motorways	Rural Trunk	Urban Trunk
Location	No junction	0.36	0.29	0.31
	Slip road	0.43	0.83	0.36
	Roundabout	3.09	3.09	5.35
	Cross road	-	0.88	1.46
	Side road	-	0.93	1.81
	Total	0.37	0.45	0.85

#### Indicative Pollution Risk Reduction Factors for Spillages

System	Optimum Risk Reduction Factor
Filter Drain	0.6
Grassed Ditch / Swale	0.6
Pond	0.5
Wetland	0.4
Soakaway / Infiltration basin	0.6
Sediment Trap	0.6
Unlined Ditch	0.7
Penstock / valve	0.4
Notched Weir	0.6
Oil Separator	0.5

The worksheet should be read in conjunction with DMRB 11.3.10.



## APPENDICES

### Appendix 11: Pre-Development Enquiry Response

# WONDERFUL ON TAP



BWB Consulting Ltd.  
5<sup>th</sup> Floor, Waterfront House  
Station Street,  
Nottingham  
NG2 3DQ

FAO: Chris Dodd

29<sup>th</sup> November 2023

Dear Chris,

## **Re: Hinckley National RFI Leicester – STW Consultation**

Apologies that it has taken a little longer to respond to your last email.

I can agree an initial discharge rate in principle being at 12 l/sec. to MH 0601. I understand at this stage there is likely to be no trade effluent to discharge from the proposed development, as the units are all to be storage / distribution units with associated offices and will generally be discharging domestic sewage flows. Severn Trent has an obligation to provide sufficient public sewer capacity upgrades to allow for development within a reasonable timescale. Presently any scheme would be within the next AMP 8 period (2025 – 2030) but could extend into AMP 9 (2030 – 2035) which would appear to fit around the proposed development timeline. However, any changes to development proposals in terms of phasing of the development and capacity requirements must be submitted to Severn Trent as early as possible, at least 12 months.

Any sewer scheme would be designed by Severn Trent to the most appropriate strategy and design that will suit Severn Trent and to keep overall costs down. The type of improvements will be deemed the most appropriate and efficient use of resources and timings. This may vary from upgrading the local foul drainage system to pumping off site to the nearest suitable treatment works or into another drainage catchment area. The connection point from the development

**Severn Trent Water Ltd**  
Leicester Water Centre  
Gorse Hill  
Anstey  
Leicester  
LE7 7GU

Tel: [REDACTED]

[www.stwater.co.uk](http://www.stwater.co.uk)  
[net.dev.east@severntrent.co.uk](mailto:net.dev.east@severntrent.co.uk)

Contact: Asset Protection  
(waste water)

Your Ref:  
Our Ref: 8458909 / AP / KB



# WONDERFUL ON TAP

SEVERN

TRENT

may also change subject to the requirements and strategy of the proposed scheme.

We would of course expect that the development will provide maximum storage requirements at each pumping station within the development site prior to the final discharge point.

Where required on site discharges to be subject to maximum on site storage being utilised (including for any trade effluent discharges if required) and to limit final discharges, if required, until the increased network capacity has been provided.

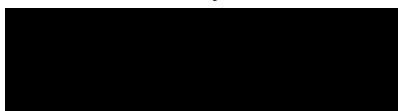
I can also accept the Protective Provisions outlined in your earlier correspondence and in line with our standard asset protection requirements.

Meanwhile I will be raising another sewer modelling request based on a total output of 12 l/sec, to better understand the local foul sewer network, because the previous model was carried out some time ago and the models are likely to have been upgraded since then, plus there are various scenarios that I would want to model for, i.e. a slightly higher discharge rate – to allow for some trade effluent, but at a lower rate than the 14 l/sec initially given. This will help to assess the most appropriate areas to concentrate on for capacity improvements within the network.

I trust the above is sufficient for your to progress the DCO process at this stage.

Please quote the above reference number in any future correspondence (including e-mails) with STW Limited. Please send **all correspondence** to the [Asset.Protection@severntrent.co.uk](mailto:Asset.Protection@severntrent.co.uk) email inbox address, a response will be made within 15 days.

Yours sincerely,

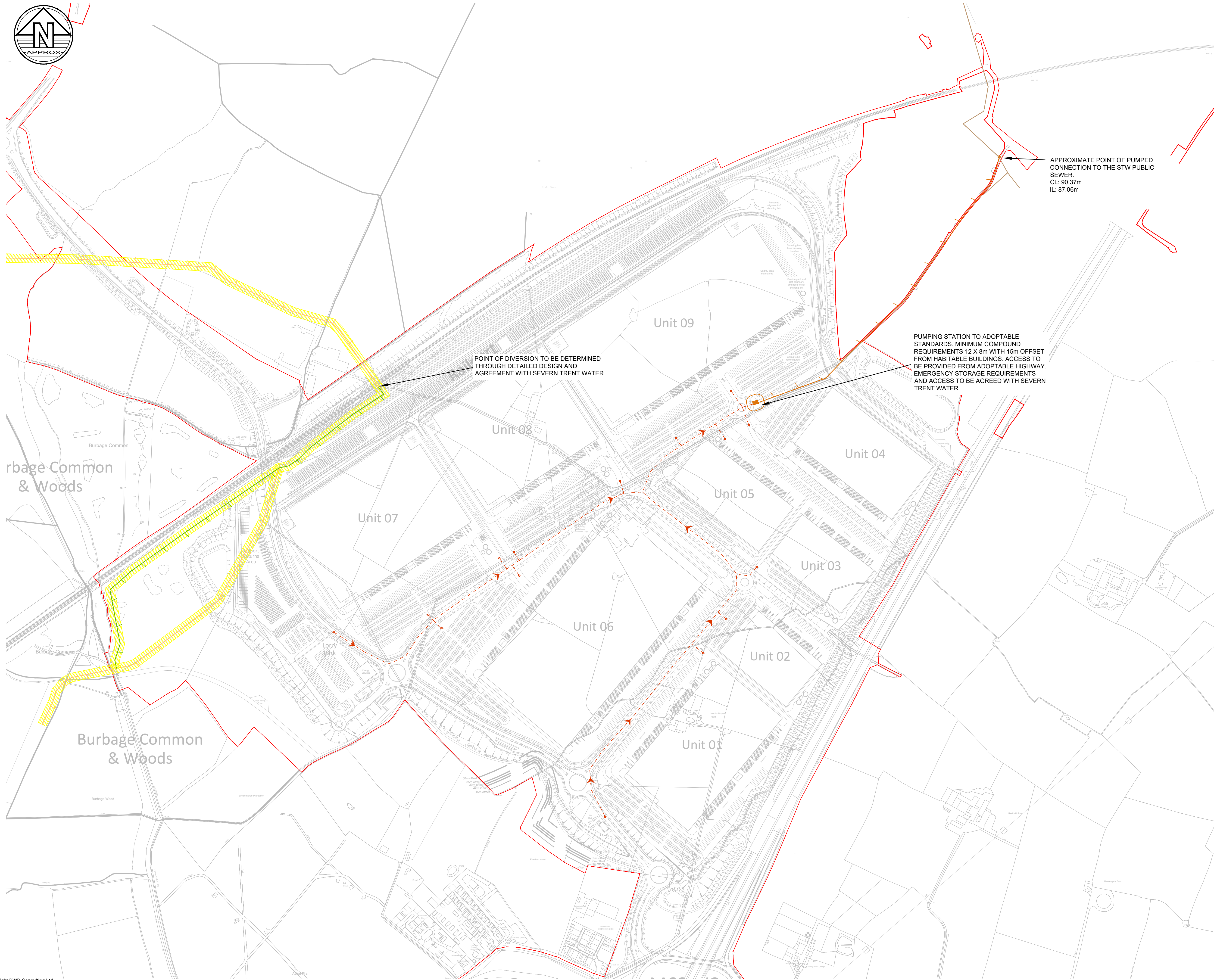


Keith Baker  
**Senior Evaluation Technician**  
**Asset Protection (wastewater)**  
**Asset Strategy and Planning**  
**Chief Engineer**  
**Severn Trent Water**

## APPENDICES

### Appendix 12: Concept Foul 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. Drawing provided for illustrative purposes only. Design subject to further coordination and approvals.
6. Layout based on AJA drawing: 5905-177.
7. Foul water connection and site wide pumping requirements to be discussed and agreed with Severn Trent Water.
8. Foul water pumping station to be located above the 1 in 200 year flood extent.

Legend

- APPLICATION BOUNDARY
- EXISTING SEVERN TRENT WATER PUBLIC FOUL SEWER
- INDICATIVE FOUL WATER DRAINAGE RUN
- FOUL PUMPING STATION AND RISING MAIN
- APPROXIMATE LOCATION OF EXISTING RISING MAIN WITH 20m EASEMENT
- POTENTIAL DIVERSION ROUTE. TO BE AGREED WITH SEVERN TRENT WATER

P06	21.11.22	Diversion route updated	RJ	CD
P05	11.08.22	Existing Rising Main / Diversion added	RJ	CD
P04	18.07.22	Text Amendments	CMD	CD
P03	14.12.21	Updated DCO boundary	RJ	CD
P02	01.10.21	Updated to latest masterplan	RJ	CD
P01	10.09.21	Preliminary Issue	RJ	CD
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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Client  
**TRITAX SYMMETRY**

Project Title  
**HINCKLEY RAIL FREIGHT INTERCHANGE**

Drawing Title  
**CONCEPT FOUL DRAINAGE STRATEGY PLAN**

Drawn:	RJ	Reviewed:	CD
BWB Ref:	NTT 2814	Date:	10.09.21
Scale:	A1: 1:4000		

Drawing Status  
**PRELIMINARY**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HRF-BWB-EWE-ZZ-DR-CD-00504	S2	P06