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Document Ref: **10170-DR001**

Project Address: **Peggs Close, Earl Shilton, LE9 7BP**

Client: **Hinckley & Bosworth Borough Council**

Report By:

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Production & Approval Record			
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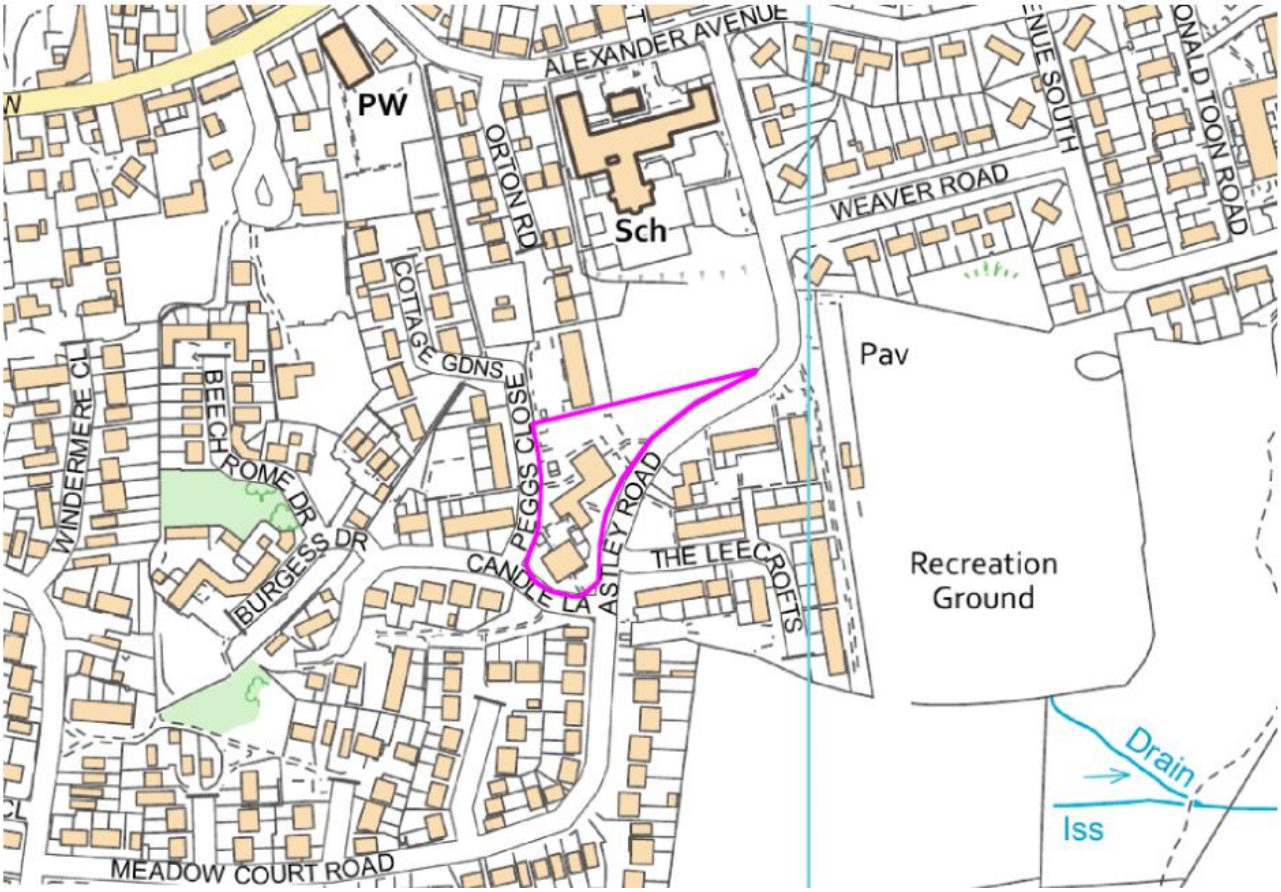
Revision Record			
Revision Reference	**Date**	**Details**	
SC001	21.07.25	First Issue	

INTRODUCTION & SITE PROPOSAL

This drainage strategy has been prepared in support of a planning application for 21 new dwellings on land at Peggs Close, Earl Shilton, LE9 7BP. The site currently hosts three, three-storey residential buildings and is situated in a residential area.

Figure 1: Location Plan

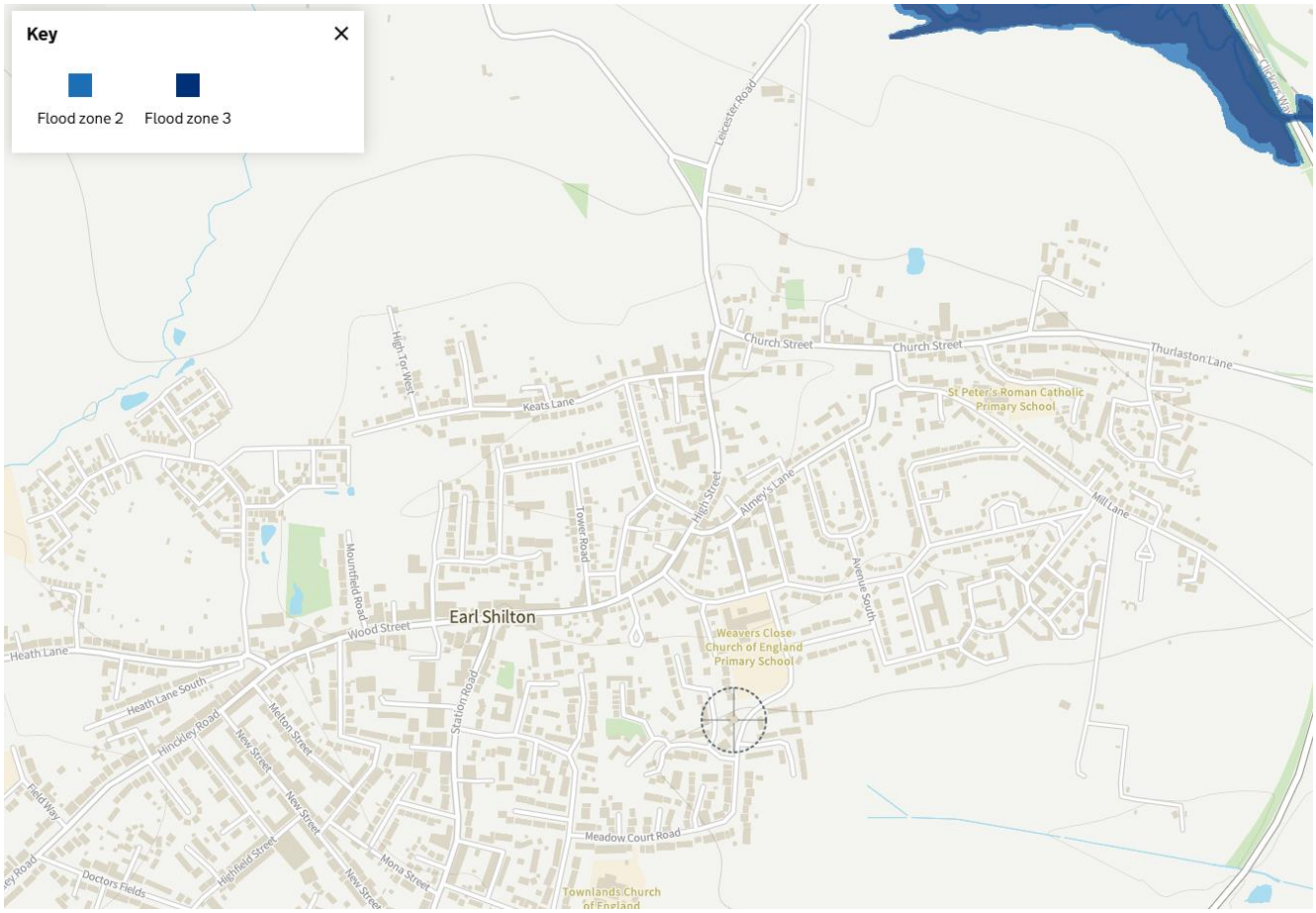


The proposed development site area totals approximately 0.46ha.

FLOOD RISK DATA REVIEW

Flood Zone

The Flood Map for Planning Service has been reviewed and an extract shown below confirming the site classification, which is Flood Zone 1, indicating Low probability of flooding from the rivers and sea.



Full descriptors of the flood zones are available in Table 1 of the NPFF.

Sequential & Exception Test

As the site is in Flood Zone 1 it is not necessary to undertake a sequential or exception test.

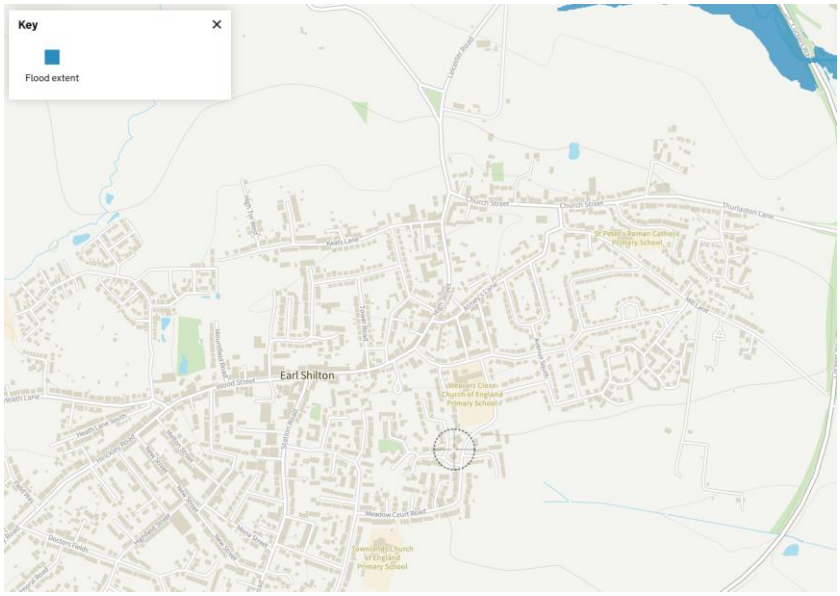
Climate Change

The site is likely to have a design life that would extend into the '2080s' thus giving an upper end climate change allowance of 40% in accordance with the Environment Agency's Climate Change Allowance guidance Table 2.

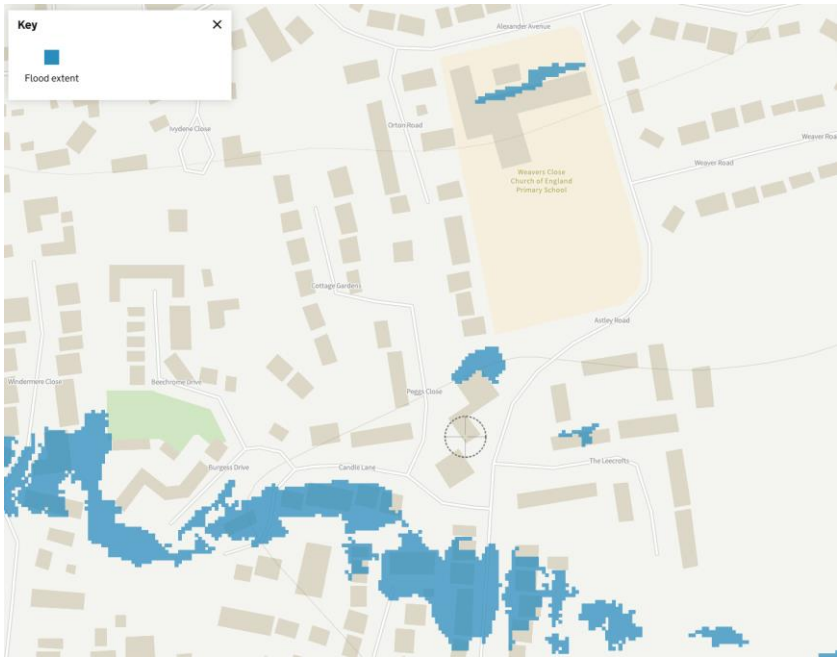
Site Specific Flood Risk

The Environment Agency's Long Term Flood Risk map has been reviewed to determine other sources of flooding that may be present on site, which are summarise below.

Rivers & Sea – no flood risk shown:



Surface Water – localised risk of surface water flooding from surface water, associated with a small area within an existing car park to the North of the site:



In addition to the above surface water map, a topographical survey of the site is available and does not indicate a depression that would cause water to pond. Generally, levels fall north to south.

Reservoirs – no risk of flooding from reservoirs is shown within or near the site.

Groundwater – flooding from groundwater has been identified as unlikely in this area.

Suitability

The site has been established to be located in Flood Zone 1.

Table 2 in the NPPF sets out the Flood Risk Vulnerability Classification – in this case, residential dwelling house, the site is deemed 'More Vulnerable'.

Table 3 in the NPPF demonstrates Flood Risk Vulnerability and Flood Zone Compatibility. More vulnerable development in Flood Zone 1 is deemed appropriate.

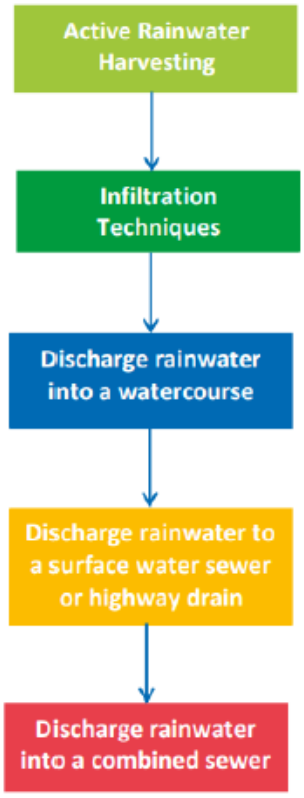
Mitigation

No flood risk mitigation required.

DRAINAGE HIERARCHY

The NPPF has a presumption in favour of sustainable development and designers must consider all sustainable options in line with the drainage hierarchy. Furthermore, Approved Document H and the Design & Construction Guidance which forms the technical requirements of the Sewerage Sector Guidance to inform water authorities requires that designers consider sustainable options as a priority.

The drainage hierarchy is outlined below:



Appraisal of Options

Rainwater Harvesting – rainwater harvesting has been considered for the development, however this fails to provide adequate volumes of storage as they often sit full in time of need. The additional plumbing for greywater systems within small residential developments is prohibitive for the minimal water demand considering the work undertaken to reduce water consumption within homes. This option has been deemed inefficient and not cost-effective and has therefore been ruled out.

Infiltration – a site specific soil investigation report has been carried out and the results indicate ground conditions across the site are unsuitable for the use of conventional soakaway drainage. Refer to Paddock Geo Engineering report reference P25-139gi, entitled Ground Investigation, dated July 2025.

Discharge to watercourse – No watercourse is present on or adjacent to the site so this option is not feasible.

Discharge to sewers – a network of surface water sewers runs around the site, which the existing development connects into.

DRAINAGE STRATEGY

Based on the above, it is proposed to discharge the surface water into the existing surface water sewer network.

An assessment of the existing greenfield runoff rate has been carried out, provided in the appendices, which gives a 100 year flow rate of 5.1l/s. Consequently, the network will be designed to restrict total discharge from site to 5.0l/s in a 1 in 100 + 40% for climate change scenario.

Please refer to dbstructural drawings 10170-SK001 Surface Water Catchment Areas and 10170-SK002 Surface Water Drainage Strategy, provided in the appendices.

There will be four points of discharge from the site, summarised below.

- Plots 1-3 with associated parking areas (highlighted pink on 10170-SK001), will be attenuated and have a restricted discharge of 1.0l/s to the existing sewer on Peggs Close.

- Plots 10-14 with associated parking areas (highlighted orange on 10170-SK001), will be attenuated and have a restricted discharge of 1.0l/s to the existing sewer on Candle Lane.

- The flats and plots 15-16, with associated parking areas (highlighted blue on 10170-SK001), will be attenuated and have a restricted discharge of 1.0l/s to the existing sewer on Astley Road.

- Plots 17-21 with associated parking areas (highlighted green on 10170-SK001), will be attenuated and have a restricted discharge of 2.0l/s to the existing sewer on Astley Road.

Attenuation will take the form on underground storage tanks.

The use of a tanked sub-base to the parking areas to provide storage was initially considered, but the topography of the site and volumes of water deem this unfeasible.

APPENDICES

- **Appendix A:** 10170-SK001 Surface Water Catchment Areas
- **Appendix B:** 10170-SK002 Surface Water Drainage Strategy
- **Appendix C:** Greenfield Runoff Rate Estimation Calculation
- **Appendix D:** Severn Trent Asset Records
- **Appendix E:** Surface Water Strategy Design Calculations

Appendix A: 10170-SK001 Surface Water Catchment Areas

PROJECT CONTACT:
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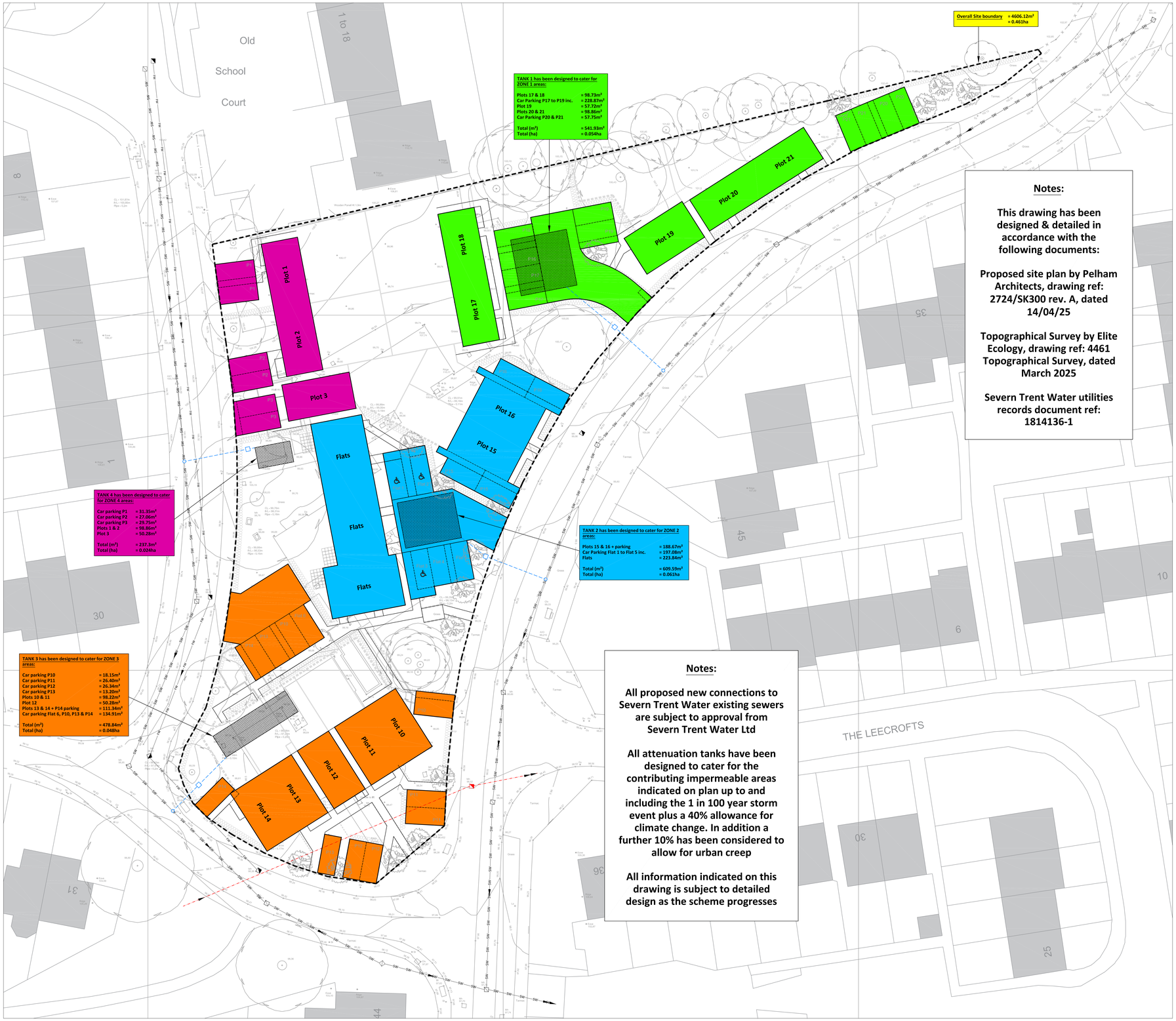

SCALE 1 : 200 @ A0 — 0m 5 10 15 20

HEALTH, SAFETY & ENVIRONMENT

It is the responsibility of the client to ensure that those undertaking the works are competent and experienced in the type of work to be undertaken.

In addition to the hazards usually associated with the types of work detailed on this drawing, the following specific hazards have been identified through design risk assessment. The planning and execution of the works should take into account all usual and specific hazards.

Hazards should also be taken into account in the maintenance, operation, decommissioning and demolition of the works.

⚠ Responsibility for temporary works lies with the Contractor at all times

⚠ Live services may be present on site

NOTES

1. All dimensions are in millimetres (mm) and levels in metres Above Ordnance Datum (mAOD) unless noted otherwise.
2. Do not scale from this drawing.
3. The copyright in this drawing belongs to dbstructural; the designs and details may not be used on any project other than that indicated in the titleblock.
4. This design assumes that any applicable planning applications, building regulation applications, utility agreements and Party Wall agreements are approved and in place prior to the commencement of works.

Rev.	Date	Description	Drawn	Checked
	18.07.25	FIRST ISSUE	PC	DB

FOR PLANNING

PEGGS CLOSE, EARL SHILTON, LEICESTER, LE9 7BP

SURFACE WATER CATCHMENT AREAS

1:200 @ A0 | JULY 2025

Dwg No: 10170-SK001

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Appendix B: 10170-SK002 Surface Water Drainage Strategy

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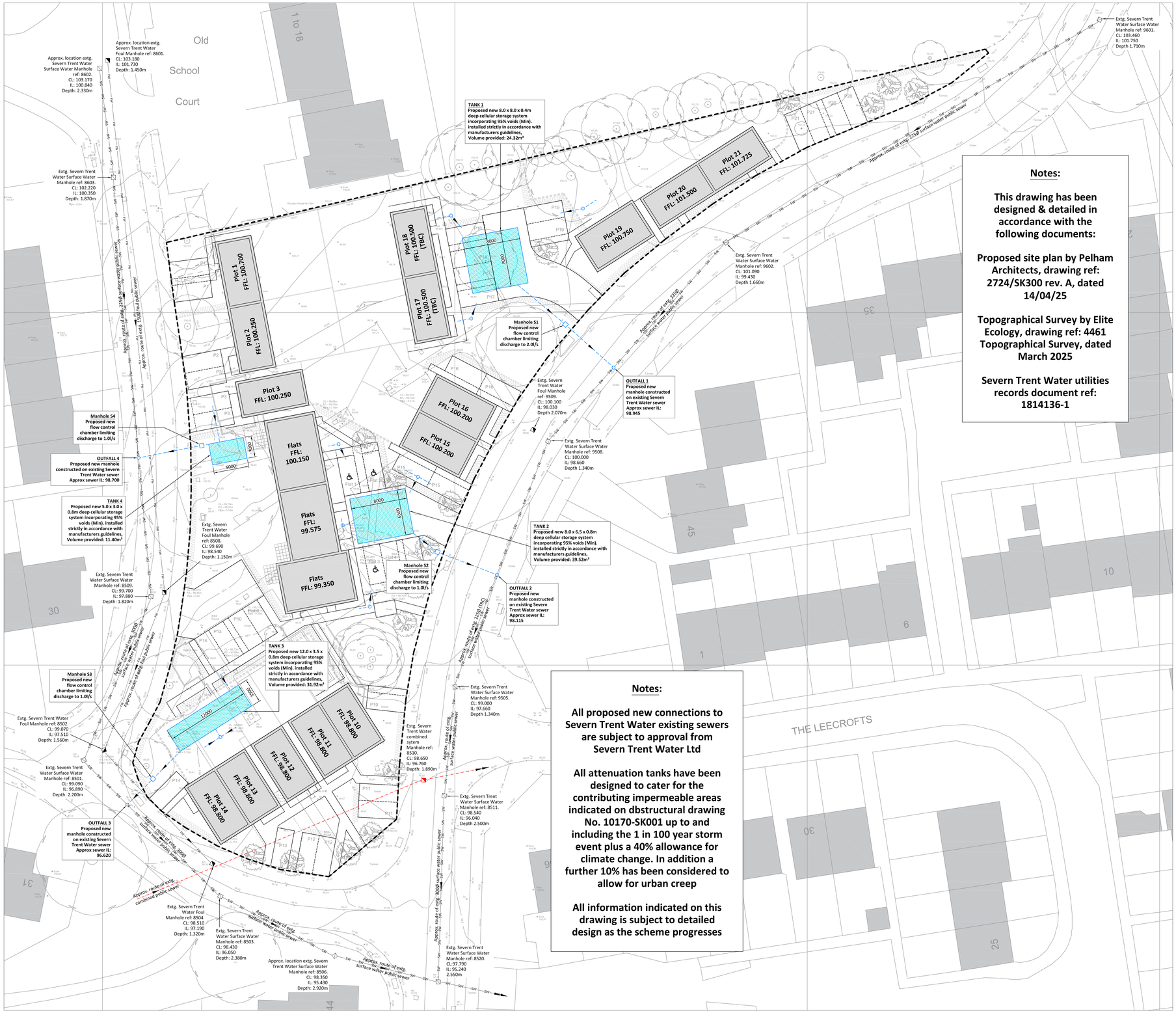

SCALE 1 : 200 @ A0

0m 5 10 15 20

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-	18.07.25	FIRST ISSUE	PC	DB

FOR PLANNING

PEGGS CLOSE, EARL SHILTON, LEICESTER, LE9 7BP

SURFACE WATER DRAINAGE STRATEGY

1:200 @ A0 | JULY 2025

Dwg No: 10170-SK002

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Appendix C: Greenfield Runoff Rate Estimation Calculation

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

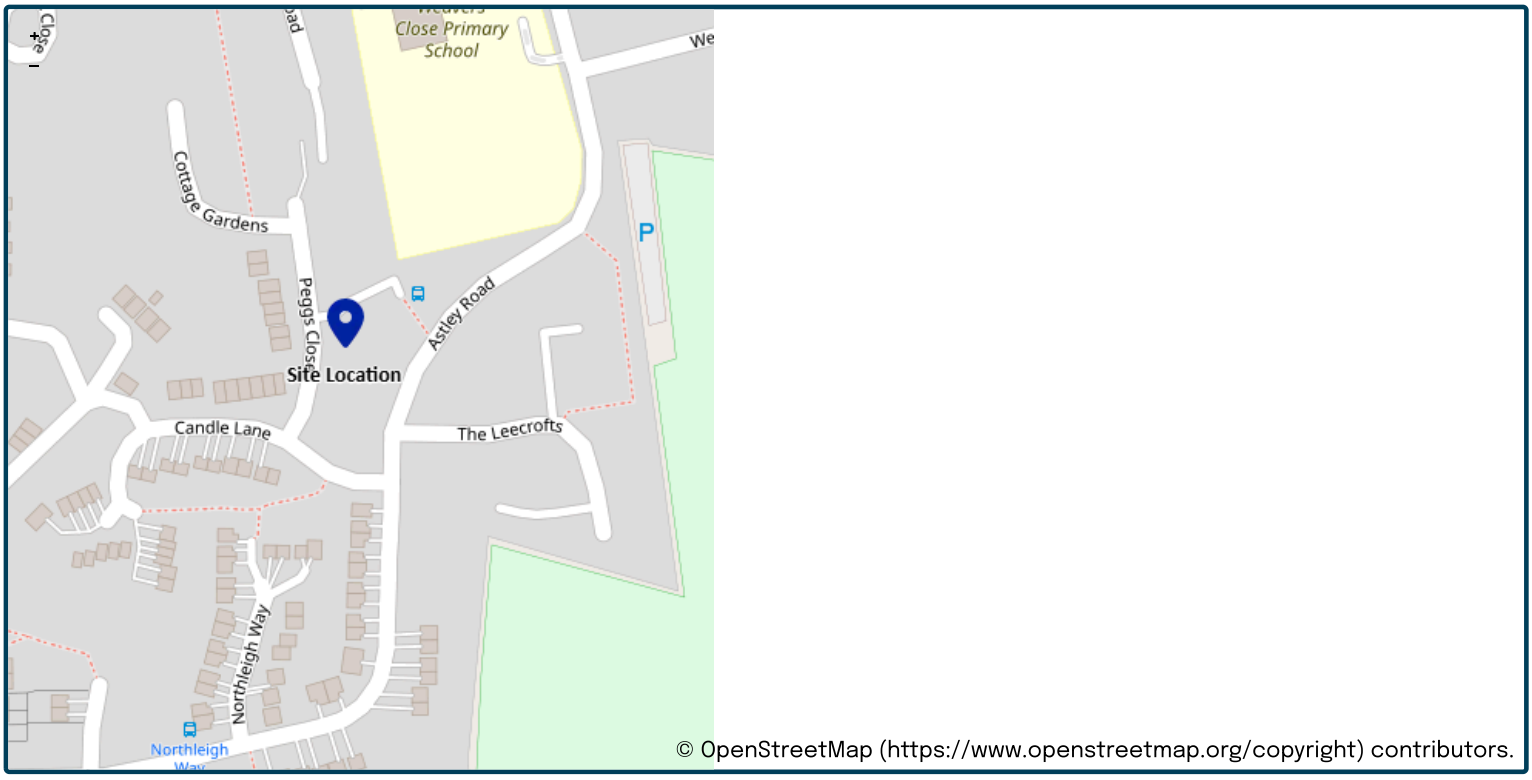
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	14/07/2025
Calculated by	PC
Reference	10170
Model version	2.0.1

Location

Site name	Peggs Close
Site location	Leicester



Site easting	446873
Site northing	297569

Site details

Total site area (ha)	0.461 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	631 mm		631
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	2 l/s		

Growth curve factors

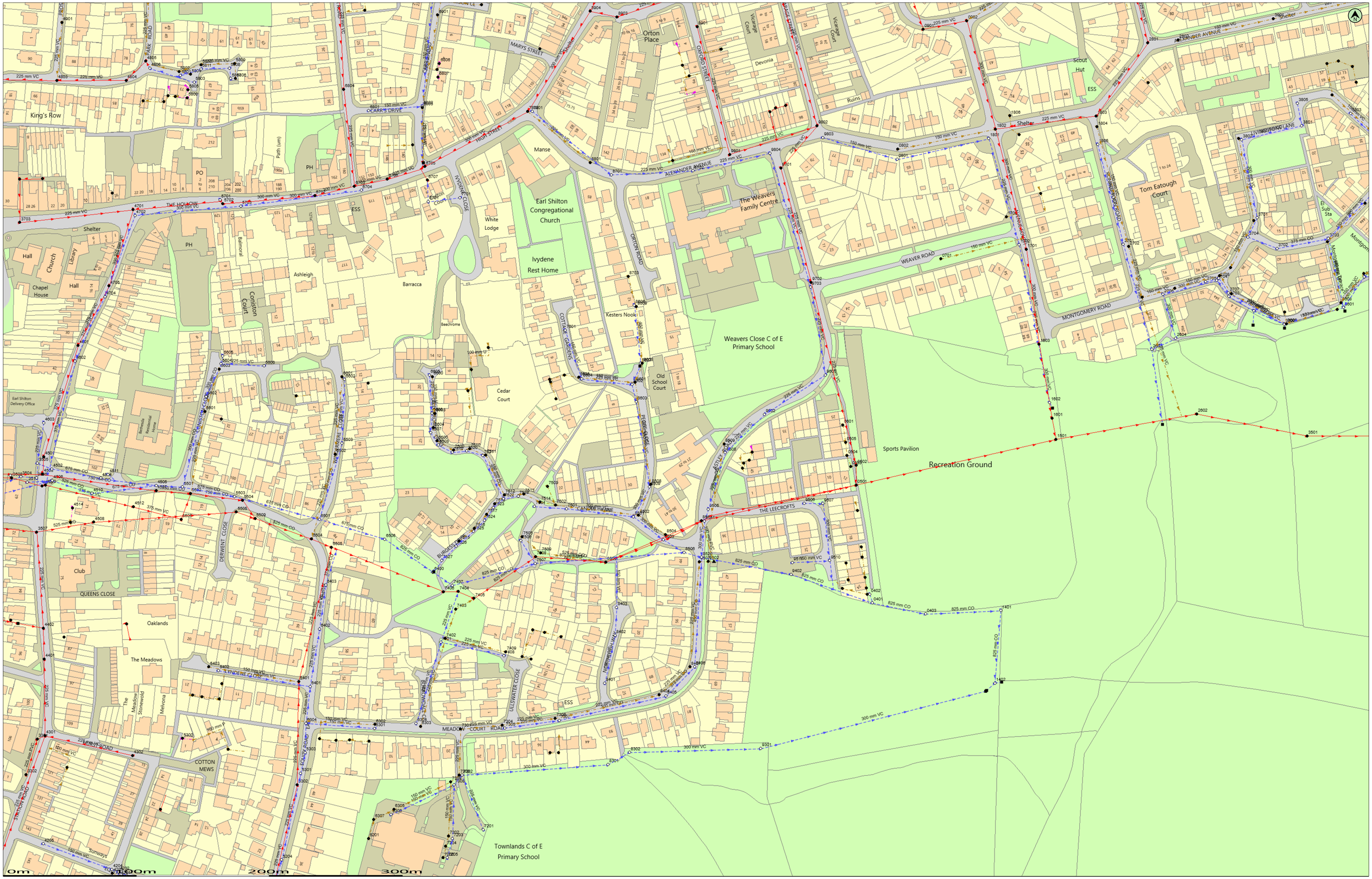
	My value		Map value
Hydrological region	4		4
1 year growth factor	0.83		
2 year growth factor	0.89		
10 year growth factor	1.49		
30 year growth factor	2		
100 year growth factor	2.57		
200 year growth factor	3.04		

Results

Method	IH124
Flow rate 1 year (l/s)	1.6 l/s
Flow rate 2 year (l/s)	1.8 l/s
Flow rate 10 years (l/s)	2.9 l/s
Flow rate 30 years (l/s)	3.9 l/s
Flow rate 100 years (l/s)	5.1 l/s
Flow rate 200 years (l/s)	6 l/s

Disclaimer

Appendix D: Severn Trent Asset Records



(c) Crown copyright and database rights 2025 Ordnance Survey AC0000808122 | Date: 02/07/25 | Scale: 1:1250 | Map Centre: 446885,297593 | Data updated: 14/06/25 | Our Ref: 1814136 - 1

Wastewater Plan A1
Powered by digdat

Public Foul Gravity/Lateral Drain
Public Combined Gravity/Lateral Drain
Public Surface Water Gravity/Lateral Drain
Pressure Foul
Pressure Combined
Pressure Surface Water
Highway Drain
Overflow Pipe
Disposal Pipe
Culverted Water Course
Pumping Station
Fitting
Manhole Foul
Manhole Surface
Abandoned Pipe
Chamber
Section 104 sewers are shown in green
Private sewers are shown in magenta

darren@dbstructural.co.uk
Peggs Close

SEVERN TRENT

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
	C		0	0
	C		0	0
	C		0	0
	C		0	0
	C		0	0
	C		0	0
	C		0	0
	C		0	0
0501	C	99.9	96.3	3.6
0502	C	99.89	97.72	2.17
0901	C	114.72	113.59	1.13
0902	C	111.69	109.65	2.04
1501	C	97.97	0	0
1601	C	98.41	97.27	1.14
1603	C	100.94	99.58	1.36
1701	C	103.81	102.44	1.37
1802	C	108.13	106.28	1.85
1803	C	108.87	106.98	1.89
2602	C	98.07	96	2.07
2801	C	111.96	109.94	2.02
3301	C	110.11	107.83	2.28
3302	C	110.96	107.93	3.03
3501	C		0	0
3507	C	103.98	101.02	2.96
3508	C	104.18	102.28	1.9
3703	C	110.73	108.74	1.99
4301	C	110.01	107.71	2.3
4302	C	109.79	108.25	1.54
4401	C	108.37	0	0
4402	C	107.31	104.98	2.33
4501	C	103.77	101.43	2.34
4503	C	103.72	101	2.72
4507	C	102.71	100.07	2.64
4508	C		0	0
4509	C	103.73	101.91	1.82
4512	C	103.18	101.6	1.58
4513	C	103.75	101.95	1.8
4601	C	106.77	103.99	2.78
4701	C	109.48	106.56	2.92
4705	C	108.1	105.42	2.68
4803	C	115.14	112.88	2.26
4804	C	114.75	113.41	1.34
4805	C	115.27	113.52	1.75
5302	C	105.87	104.15	1.72
5401	C	103.64	101.84	1.8
5502	C	102.63	99.89	2.74
5504	C	101.93	99.59	2.34
5505	C	102.14	99.67	2.47
5506	C	102.72	101.27	1.45
5509	C	102.01	99.56	2.45
5702	C	110.11	107.51	2.6
6504	C	101.29	99.16	2.13
6505	C	101.36	99.03	2.33
6702	C	111.71	108.52	3.19
6703	C	112.62	109.93	2.69
6705	C	114.26	112.25	2.01
6706	C	113.48	111.21	2.27
6707	C	114.06	112.63	1.43
6804	C	117.28	114.79	2.49
7404	C	100.19	97.4	2.79
7405	C	100.48	96.35	4.13
7406	C	100.06	97.87	2.19
7508	C	99.03	97.36	1.67
7802	C	116.38	114.34	2.04
8505	C	98.75	96.98	1.77
8510	C	98.65	96.76	1.89
8901	C	119.04	117.86	1.18
8903	C	119.47	117.29	2.18
8904	C	119.29	117.11	2.18
9701	C	112.85	110.88	1.97
9702	C	107.02	105.18	1.84
9801	C	114.58	113.76	0.82
9802	C	114.29	112.34	1.95
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
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	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
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	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		100.65	0
	F		102.81	0
	F		101.29	0
	F		101.68	0
	F		101.08	0
	F		100.39	0
	F		103.4	0
	F		100.57	0
	F		101.24	0
	F		103.55	0
	F		0	0
	F		107.32	0
	F		106.3	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
	F		0	0
0503	F	99.76	97.92	1.84
0504	F	100.17	99.01	1.16
0505	F	100.27	99.52	0.75
0601	F	100.96	99.99	0.97
0701	F	105.77	104.52	1.25
0802	F	111.29	109.38	1.91
1704	F	105.46	103.98	1.48
1804	F	108.13	105.96	2.17
1806	F	108.03	107.04	0.99
2702	F	103.45	101.29	2.16
2802	F	112.56	111.4	1.16
3606	F	103.21	100.88	2.33
3608	F	102.2	101.1	1.1
3901	F	112.65	110.38	2.27
4201	F	110.89	109.1	1.79
4203	F	110.97	109.14	1.83
4514	F		0	0
4901	F	117.51	115.8	1.71
5300	F		0	0
5403	F	105.92	104.75	1.17
5601	F	102.94	100.9	2.04
5603	F	104.46	101.34	3.12
5800	F		0	0
5802	F	114.99	113.84	1.15
5804	F	115.14	113.99	1.15
5805	F		0	0
5806	F	115.52	114.38	1.14
5809	F	115.74	113.98	1.76
5810	F	115.37	0	0
6201	F	104.33	103.58	0.75
6302	F	105.79	104.5	1.29
6303	F	105.4	103.28	2.12
6305	F	104.35	103.14	1.21
6307	F	104.33	103.35	0.98
6500	F		0	0
6502	F	101.71	100.03	1.68
6600	F		0	0
6601	F	104.06	101.69	2.37
6603	F		0	0
6604	F		0	0
6803	F	117.18	115.52	1.66
6806	F		0	0
6807	F		0	0
6901	F	119.79	118.25	1.54
7202	F	103.72	102.95	0.77
7204	F	104.29	103.09	1.2
7206	F	104.33	0	0
7301	F	104.63	101.9	2.72
7303	F	103.84	102.31	1.53
7304	F	103.39	101.4	1.99
7306	F	101.9	99.61	2.29
7309	F	104.08	102.48	1.6
7402	F	102.32	97.81	4.51
7403	F	101.21	97.39	3.82
7409	F	101.32	98.7	2.62
7500	F		0	0
7502	F	99.5	98.13	1.37
7503	F	100.03	98.34	1.69
7505	F	98.6	97.68	0.92

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
7510	F		0	0
7511	F		0	0
7512	F		0	0
7513	F		0	0
7514	F		0	0
7515	F		0	0
7516	F		0	0
7517	F		0	0
7518	F		0	0
7906	F	119.81	118.81	1
8404	F	98.46	96.27	2.19
8407	F	97.44	95.24	2.2
8502	F	99.07	97.51	1.56
8504	F	98.51	97.19	1.32
8507	F	97.84	95.13	2.71
8508	F	99.69	98.54	1.15
8601	F	103.18	101.73	1.45
8605	F	104.14	102.44	1.7
8608	F	104.63	103.05	1.58
8609	F	108.03	106.12	1.91
8703	F	109.32	107.52	1.8
8801	F	115.41	114.58	0.83
9502	F	96.98	94.98	2
9509	F	100.1	98.03	2.07
	S		0	0
0401	S	96.18	93.8	2.38
0402	S	96.36	95.46	0.9
0403	S	95.3	93.58	1.72
0801	S		0	0
1401	S	94.76	93.1	1.66
1402	S	95	92.48	2.52
1602	S	98.96	97.19	1.77
1702	S		0	0
1801	S	108.18	106.38	1.8
1805	S	107.17	105.59	1.58
2603	S	99.34	0	0
2604	S	101.22	99.14	2.08
2701	S	103.97	101.93	2.04
2703	S	103.17	99.69	3.48
2704	S	103.41	99.61	3.8
2705	S	103.06	101.56	1.5
2706	S	104.49	99.35	5.14
2707	S	103.25	101.27	1.98
2708	S	103.51	101.37	2.14
3504	S		0	0
3505	S	103.87	102.77	1.1
3506	S	103.83	102.49	1.34
3515	S	103.8	102.66	1.14
3601	S	102.2	101.25	0.95
3602	S	102.72	100	2.72
3609	S	102.51	101.03	1.48
3701	S	105.16	103.64	1.52
3702	S	104.53	102.87	1.66
3703	S	104.14	102.34	1.8
3704	S	104.68	103.01	1.67
3709	S	103.41	101.43	1.98
3801	S	109.37	107.66	1.71
3802	S	108.65	107.24	1.41
3803	S	108.89	107.59	1.3
3805	S	110.02	108.47	1.55
4202	S	110.9	109.14	1.76
4204	S	110.98	109.21	1.77
4205	S	111.87	110.28	1.59
4502	S	103.6	102.01	1.59
4504	S	103.29	101.83	1.46
4505	S	102.74	101.27	1.47
4506	S	103.84	102.25	1.59
4510	S	103.42	101.94	1.48
4511	S	103.47	102.06	1.41
4602	S	106.33	103.9	2.43
4603	S	103.95	103.19	0.76
4702	S	109.43	107.07	2.36
4704	S	108.19	105.5	2.69
4806	S	115.18	113.76	1.42
5204	S	106.57	104.85	1.72
5301	S	105.9	104.08	1.82
5303	S	105.29	103.31	1.98
5304	S	104.66	102.95	1.71
5402	S	105.79	104.43	1.36
5501	S	102.55	101.17	1.38
5503	S	102.04	100.64	1.4
5602	S	103.16	101.68	1.48
5604	S	104.56	102.48	2.08
5605	S	105.05	102.93	2.12
5606	S	104.59	102.73	1.86
5701	S	110.11	109.24	0.87
5703	S	110.42	107.77	2.65
5801	S	115	114.12	0.88
5803	S	115.08	113.91	1.17
5807	S	115.52	114.52	1
5808	S	115.94	114.58	1.36
5811	S	115.28	114.16	1.12
6301	S	105.78	104.42	1.36
6304	S	105.39	103.72	1.67
6306	S	104.33	103.07	1.26
6400	S	100.57	0	0
6401	S	103.68	102.26	1.42
6402	S	102.21	101.23	0.98
6403	S	101.5	99.82	1.68
6501	S	101.28	99.91	1.37
6503	S	101.97	100.55	1.42
6506	S		99.91	0
6507	S	102.48	100.73	1.75
6508	S	101.93	100.14	1.79

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
6605	S		103.33	0
6606	S	101.47	101.47	0
6701	S	113.74	112.87	0.87
6704	S	112.76	110.18	2.58
6801	S	116.82	115.03	1.79
6802	S	117.18	114.47	2.71
7201	S	103.23	102.21	1.02
7203	S	103.7	102.78	0.92
7205	S	104.28	103.2	1.08
7302	S	103.85	101.78	2.07
7305	S	103.49	101.75	1.74
7307	S	101.81	99.96	1.85
7308	S	104.09	102.31	1.78
7401	S	102.49	98.54	3.95
7407	S	100.03	96.84	3.19
7408	S	101.29	99	2.29
7501	S	99.52	97.51	2.01
7504	S	99.52	97.81	1.71
7506	S	98.58	96.98	1.6
7507	S	99.06	96.31	2.75
7519	S	101.49	99.95	1.54
7520	S	101.28	99.61	1.67
7521	S	101.15	99.52	1.63
7522	S	100.85	99.18	1.67
7523	S	101.13	98.27	2.86
7524	S	101.06	98.25	2.81
7525	S	100.97	98.22	2.75
7526	S	100.78	98.18	2.6
7527	S	100.8	98.11	2.69
7528	S	100.32	99.34	0.98
7601	S	106.52	104.28	2.24
7701	S	113.87	113.12	0.75
7801	S	115.69	0	0
8301	S	100.42	99.3	1.12
8302	S	99.94	99.01	0.93
8401	S	99.62	98.5	1.12
8402	S	97.98	96.65	1.33
8403	S	97.1	95.76	1.34
8405	S	98.43	96.63	1.8
8406	S	97.49	95.73	1.76
8501	S	99.09	96.89	2.2
8503	S	98.43	96.05	2.38
8506	S	98.35	95.43	2.92
8509	S	99.7	97.88	1.82
8511	S	98.54	96.04	2.5
8520	S	97.79	95.24	2.55
8602	S	103.17	100.84	2.33
8603	S	102.22	100.35	1.87
8604	S	104.14	102.21	1.93
8606	S	108.42	103.62	4.8
8607	S	104.65	101.93	2.72
8701	S	114.77	113.28	1.49
8702	S	114.16	112.87	1.29
9301	S	96.03	94.78	1.25
9402	S	96.95	94.24	2.71
9505	S	99	97.66	1.34
9506	S	98.84	97.56	1.28
9507	S	98.96	96.69	2.27
9508	S	100	98.66	1.34
9510	S	97.64	95.68	1.96
9511	S	97.43	96.25	1.18
9601	S	103.46	101.75	1.71
9602	S	101.09	99.43	1.66
9703	S	106.95	105.34	1.61
9803	S	113.65	111.74	1.91
9804	S	113.83	111.98	1.85

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix E: Surface Water Strategy Design Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	10	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
TANK 1	0.054	5.00	100.350	1200	446908.922	297603.945	1.150
S1	0.000		100.400	1200	446915.695	297598.317	1.290
OUTFALL 1	0.000		100.110	1200	446922.526	297592.211	1.090
TANK 2	0.061	5.00	99.650	1200	446894.142	297568.670	1.325
S2	0.000		99.750	1200	446897.534	297566.037	1.470
OUTFALL 2	0.000		99.150	1200	446905.965	297562.813	0.960
TANK 3	0.048	5.00	98.650	1200	446861.028	297537.760	1.775
S3	0.000		98.650	1200	446857.149	297533.861	1.830
OUTFALL 3	0.000		98.690	1200	446853.508	297530.201	1.920
TANK 4	0.024	5.00	100.000	1200	446865.055	297581.347	1.075
S4	0.000	5.00	100.000	1200	446864.066	297581.142	1.085
OUTFALL 4	0.000		100.300	1200	446855.122	297579.399	1.475

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	TANK 1	S1	8.806	0.600	99.200	99.110	0.090	97.8	150	5.14	50.0
1.001	S1	OUTFALL 1	9.162	0.600	99.110	99.020	0.090	101.8	150	5.30	50.0
2.000	TANK 2	S2	4.294	0.600	98.325	98.280	0.045	95.4	150	5.07	50.0
2.001	S2	OUTFALL 2	9.026	0.600	98.280	98.190	0.090	100.3	150	5.22	50.0
3.000	TANK 3	S3	5.500	0.600	96.875	96.820	0.055	100.0	150	5.09	50.0
3.001	S3	OUTFALL 3	5.163	0.600	96.820	96.770	0.050	103.3	150	5.18	50.0
4.000	TANK 4	S4	1.010	0.600	98.925	98.915	0.010	101.0	100	5.02	50.0
4.001	S4	OUTFALL 4	9.112	0.600	98.915	98.825	0.090	101.2	100	5.22	50.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	8.806	97.8	150	Circular	100.350	99.200	1.000	100.400	99.110	1.140
1.001	9.162	101.8	150	Circular	100.400	99.110	1.140	100.110	99.020	0.940
2.000	4.294	95.4	150	Circular	99.650	98.325	1.175	99.750	98.280	1.320
2.001	9.026	100.3	150	Circular	99.750	98.280	1.320	99.150	98.190	0.810
3.000	5.500	100.0	150	Circular	98.650	96.875	1.625	98.650	96.820	1.680
3.001	5.163	103.3	150	Circular	98.650	96.820	1.680	98.690	96.770	1.770
4.000	1.010	101.0	100	Circular	100.000	98.925	0.975	100.000	98.915	0.985
4.001	9.112	101.2	100	Circular	100.000	98.915	0.985	100.300	98.825	1.375

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	TANK 1	1200	Manhole	Adoptable	S1	1200	Manhole	Adoptable
1.001	S1	1200	Manhole	Adoptable	OUTFALL 1	1200	Manhole	Adoptable
2.000	TANK 2	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
2.001	S2	1200	Manhole	Adoptable	OUTFALL 2	1200	Manhole	Adoptable
3.000	TANK 3	1200	Manhole	Adoptable	S3	1200	Manhole	Adoptable
3.001	S3	1200	Manhole	Adoptable	OUTFALL 3	1200	Manhole	Adoptable
4.000	TANK 4	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
4.001	S4	1200	Manhole	Adoptable	OUTFALL 4	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
TANK 1	446908.922	297603.945	100.350	1.150	1200	0	1.000	99.200	150
S1	446915.695	297598.317	100.400	1.290	1200	1	1.000	99.110	150
						0	1.001	99.110	150
OUTFALL 1	446922.526	297592.211	100.110	1.090	1200	1	1.001	99.020	150
TANK 2	446894.142	297568.670	99.650	1.325	1200	0	2.000	98.325	150
S2	446897.534	297566.037	99.750	1.470	1200	1	2.000	98.280	150
						0	2.001	98.280	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
OUTFALL 2	446905.965	297562.813	99.150	0.960	1200	1	2.001	98.190	150
TANK 3	446861.028	297537.760	98.650	1.775	1200	0	3.000	96.875	150
S3	446857.149	297533.861	98.650	1.830	1200	1	3.000	96.820	150
						0	3.001	96.820	150
OUTFALL 3	446853.508	297530.201	98.690	1.920	1200	1	3.001	96.770	150
TANK 4	446865.055	297581.347	100.000	1.075	1200	0	4.000	98.925	100
S4	446864.066	297581.142	100.000	1.085	1200	1	4.000	98.915	100
						0	4.001	98.915	100
OUTFALL 4	446855.122	297579.399	100.300	1.475	1200	1	4.001	98.825	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	40	0	0

Node S1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	99.110	Product Number	CTL-SHE-0076-2000-0400-2000
Design Depth (m)	0.400	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node S2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	98.280	Product Number	CTL-SHE-0049-1000-0800-1000
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node S3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	96.820	Product Number	CTL-SHE-0049-1000-0800-1000
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node S4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	98.915	Product Number	CTL-SHE-0049-1000-0800-1000
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node TANK 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	99.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	110

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	64.0	0.0	0.400	64.0	0.0	0.401	0.0	0.0

Node TANK 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.325
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	52.0	0.0	0.800	52.0	0.0	0.801	0.0	0.0

Node TANK 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	96.875
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	208

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	42.0	0.0	0.800	42.0	0.0	0.801	0.0	0.0

Node TANK 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.925
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	96

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	15.0	0.0	0.800	15.0	0.0	0.801	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	TANK 1	42	99.259	0.059	6.5	3.6808	0.0000	OK
60 minute summer	S1	40	99.277	0.167	4.6	0.1886	0.0000	SURCHARGED
15 minute summer	OUTFALL 1	1	99.020	0.000	2.0	0.0000	0.0000	OK
120 minute summer	TANK 2	86	98.433	0.108	5.6	5.5393	0.0000	OK
120 minute summer	S2	84	98.433	0.153	2.5	0.1729	0.0000	SURCHARGED
15 minute summer	OUTFALL 2	1	98.190	0.000	0.9	0.0000	0.0000	OK
60 minute summer	TANK 3	48	96.969	0.094	6.4	3.8882	0.0000	OK
60 minute summer	S3	44	96.972	0.152	2.7	0.1714	0.0000	SURCHARGED
15 minute summer	OUTFALL 3	1	96.770	0.000	0.9	0.0000	0.0000	OK
60 minute summer	TANK 4	41	99.022	0.097	2.9	1.5416	0.0000	OK
60 minute summer	S4	41	99.022	0.107	0.9	0.1209	0.0000	SURCHARGED
15 minute summer	OUTFALL 4	1	98.825	0.000	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	TANK 1	1.000	S1	4.6	0.371	0.258	0.1055	
60 minute summer	S1	Hydro-Brake®	OUTFALL 1	2.0				6.7
120 minute summer	TANK 2	2.000	S2	2.5	0.254	0.137	0.0668	
120 minute summer	S2	Hydro-Brake®	OUTFALL 2	0.9				9.5
60 minute summer	TANK 3	3.000	S3	2.7	0.282	0.154	0.0801	
60 minute summer	S3	Hydro-Brake®	OUTFALL 3	0.9				6.0
60 minute summer	TANK 4	4.000	S4	0.9	0.312	0.157	0.0079	
60 minute summer	S4	Hydro-Brake®	OUTFALL 4	0.9				3.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	TANK 1	54	99.380	0.180	15.7	11.2862	0.0000	SURCHARGED
60 minute summer	S1	54	99.378	0.268	3.0	0.3034	0.0000	SURCHARGED
15 minute summer	OUTFALL 1	1	99.020	0.000	2.0	0.0000	0.0000	OK
120 minute winter	TANK 2	118	98.653	0.328	7.9	16.8880	0.0000	SURCHARGED
120 minute winter	S2	118	98.653	0.373	2.9	0.4219	0.0000	SURCHARGED
15 minute summer	OUTFALL 2	1	98.190	0.000	0.9	0.0000	0.0000	OK
120 minute summer	TANK 3	116	97.165	0.290	9.0	12.0369	0.0000	SURCHARGED
120 minute summer	S3	116	97.164	0.344	2.7	0.3894	0.0000	SURCHARGED
15 minute summer	OUTFALL 3	1	96.770	0.000	0.9	0.0000	0.0000	OK
60 minute summer	TANK 4	51	99.219	0.294	7.0	4.6603	0.0000	SURCHARGED
60 minute summer	S4	51	99.219	0.304	1.3	0.3437	0.0000	SURCHARGED
15 minute summer	OUTFALL 4	1	98.825	0.000	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	TANK 1	1.000	S1	3.0	0.337	0.166	0.1550	
60 minute summer	S1	Hydro-Brake®	OUTFALL 1	2.0				16.4
120 minute winter	TANK 2	2.000	S2	2.9	0.350	0.158	0.0756	
120 minute winter	S2	Hydro-Brake®	OUTFALL 2	0.9				18.4
120 minute summer	TANK 3	3.000	S3	2.7	0.299	0.153	0.0968	
120 minute summer	S3	Hydro-Brake®	OUTFALL 3	0.9				17.5
60 minute summer	TANK 4	4.000	S4	1.3	0.392	0.222	0.0079	
60 minute summer	S4	Hydro-Brake®	OUTFALL 4	0.9				7.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	TANK 1	112	99.587	0.387	12.8	24.3169	0.0000	SURCHARGED
120 minute winter	S1	112	99.585	0.475	3.6	0.5372	0.0000	SURCHARGED
15 minute summer	OUTFALL 1	1	99.020	0.000	2.0	0.0000	0.0000	OK
240 minute winter	TANK 2	236	99.031	0.706	8.6	36.3485	0.0000	SURCHARGED
240 minute winter	S2	236	99.031	0.751	2.6	0.8497	0.0000	SURCHARGED
15 minute summer	OUTFALL 2	1	98.190	0.000	0.9	0.0000	0.0000	OK
180 minute winter	TANK 3	176	97.517	0.642	8.4	26.6821	0.0000	SURCHARGED
180 minute winter	S3	176	97.517	0.697	2.4	0.7878	0.0000	SURCHARGED
15 minute summer	OUTFALL 3	1	96.770	0.000	0.9	0.0000	0.0000	OK
120 minute winter	TANK 4	114	99.580	0.655	5.7	10.3595	0.0000	SURCHARGED
120 minute winter	S4	114	99.579	0.664	1.2	0.7509	0.0000	SURCHARGED
15 minute summer	OUTFALL 4	1	98.825	0.000	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	TANK 1	1.000	S1	3.6	0.335	0.202	0.1550	
120 minute winter	S1	Hydro-Brake®	OUTFALL 1	2.2				36.3
240 minute winter	TANK 2	2.000	S2	2.6	0.300	0.142	0.0756	
240 minute winter	S2	Hydro-Brake®	OUTFALL 2	1.0				24.6
180 minute winter	TANK 3	3.000	S3	2.4	0.329	0.137	0.0968	
180 minute winter	S3	Hydro-Brake®	OUTFALL 3	0.9				20.8
120 minute winter	TANK 4	4.000	S4	1.2	0.365	0.204	0.0079	
120 minute winter	S4	Hydro-Brake®	OUTFALL 4	0.9				16.3