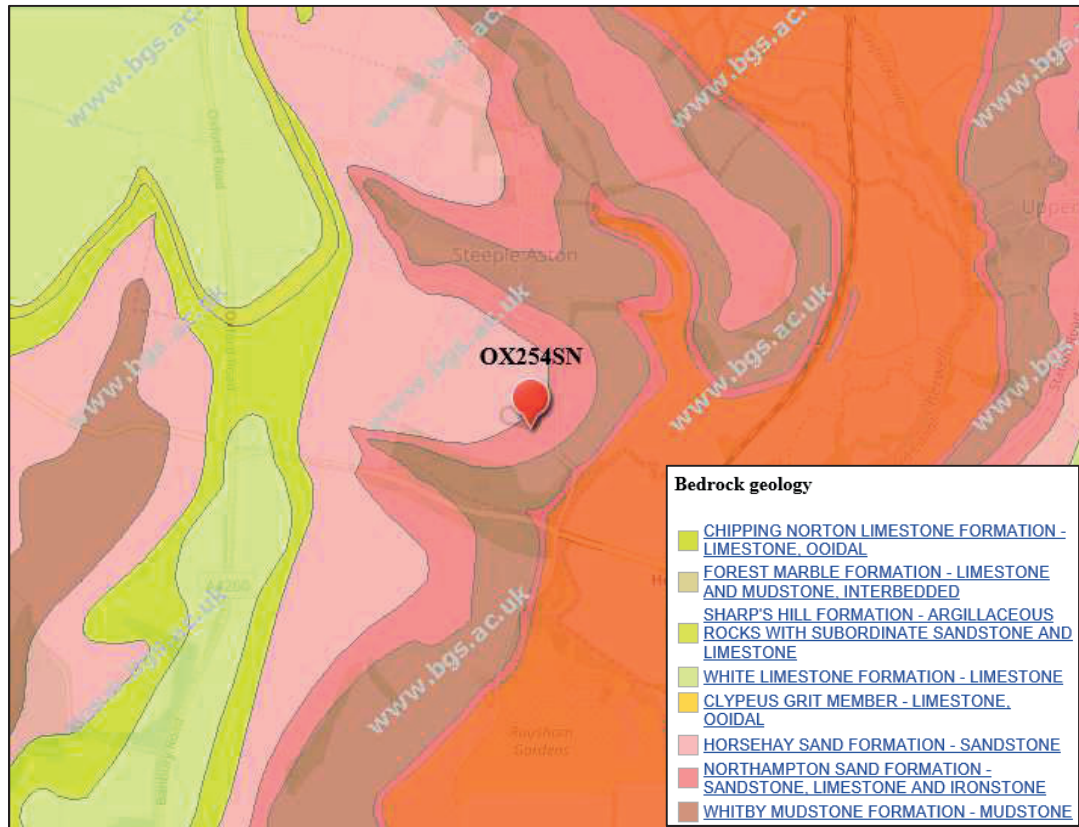


**APPENDIX A**  
**BGS Records**

## Appendix B – Geology

### British Geological Survey

#### 1.1 Bedrock Geology



**BGS Bedrock Geology**

(Source: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

- **Bedrock Geology East of Site**

1:50 000 scale bedrock geology description: Northampton Sand Formation - Sandstone, Limestone And Ironstone. Sedimentary Bedrock formed approximately 170 to 174 million years ago in the Jurassic Period. Local environment previously dominated by shallow seas.

Setting: shallow seas. These sedimentary rocks are shallow-marine in origin. They are detrital, ranging from coarse- to fine-grained (locally with some carbonate content) forming interbedded sequences.

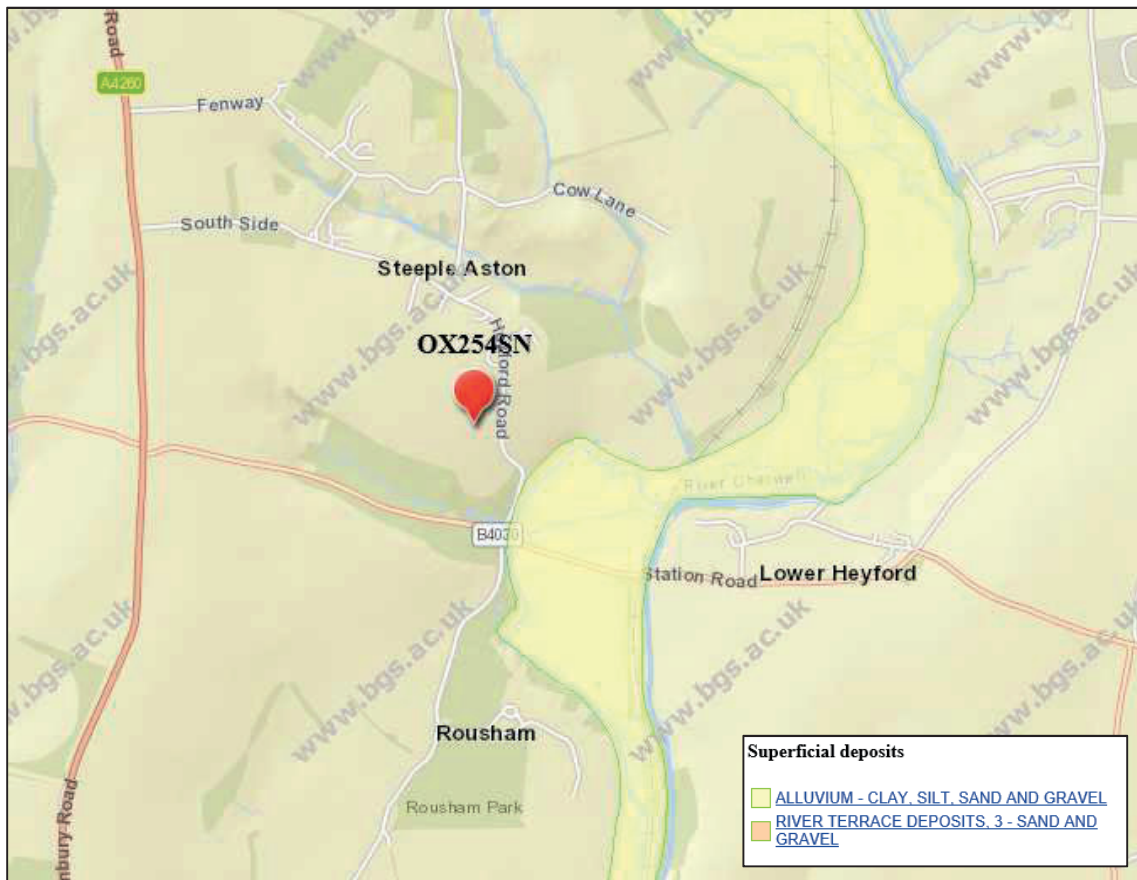
- **Bedrock Geology West of Site**

1:50 000 scale bedrock geology description: Horsehay Sand Formation - Sandstone. Sedimentary Bedrock formed approximately 166 to 170 million years ago in the Jurassic Period. Local environment previously dominated by shallow seas.

Setting: shallow seas. These sedimentary rocks are shallow-marine in origin. They are detrital, ranging from coarse- to fine-grained (locally with some carbonate content) forming interbedded sequences.

## 1.2 Superficial Geology

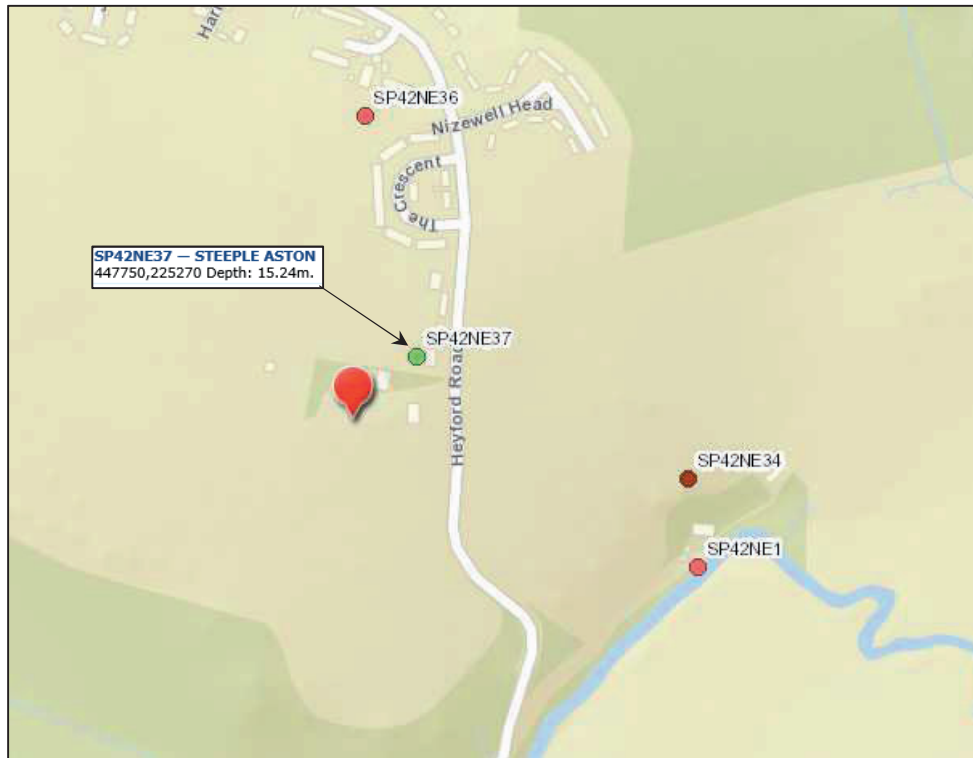
There are no records of superficial Geology for the site.



**BGS Superficial Geology**

(Source: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

### 1.3 British Geological Survey Boreholes



BGS Geology of Britain Viewer - Borehole Scan  
 (Source: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

British Geological Survey  
 at (Name of town) Council House Garden SP 448 021  
 Town, Village, &c. Steeple Aston County Stam Grid Reference 218 Sheet 16SW/W  
 Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on map). Tram started (poplar heads etc) Popular Edition Sheet 53  
 Surface level of ground 3.34 ft. above Ordnance Datum. Well or Bore commenced at 50 ft. below surface of ground.  
 Sunk 50 ft., diameter 4 ft. 6 Bored 50 ft.; diameter of boring: at top 4 in., at 50 ft. 3 in.  
 Details of lining tubes (internal diameters preferred) None obtained - Pull out cement render  
 Water struck at depths of (feet) 26 SP42/44  
 Rest-level of water below top of well or bore 16 ft. Pumping level 50 ft. Time of recovery 5 hours.  
 Suction at 50 ft. depth. Yield: (i) on test 17000 galls. per Day, (ii) normal 3000 galls. per Day  
 Quality (attach copy of analysis if available) for  
 Made by Survey & Quarry EDC, Banbury for Mr. Banbury Date of boring Dec 1986  
 Information from Survey & Quarry EDC, Banbury

GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA. (and any additional remarks)	THICKNESS.		DEPTH.	
		Feet.	Inches.	Feet.	Inches.
<u>Claystone</u>	<u>No details.</u>	<u>31</u>	<u>07</u>	<u>31</u>	<u>07</u>
<u>Claystone</u>	<u>No details.</u>	<u>51</u>	<u>12</u>	<u>51</u>	<u>12</u>

Probably sited on Clypens Grt  
pp BSPM.

BGS Borehole ref. SP42NE37  
 (Source: [http://scans.bgs.ac.uk/sobi\\_scans/boreholes/331014/images/14820085.html](http://scans.bgs.ac.uk/sobi_scans/boreholes/331014/images/14820085.html))

**APPENDIX B**  
**MicroDrainage and Design Calculations**

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

Half Drain Time : 76 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.399	0.899	0.4	2.3	O K
30 min Summer	99.623	1.123	0.4	2.8	O K
60 min Summer	99.760	1.260	0.4	3.2	Flood Risk
120 min Summer	99.783	1.283	0.5	3.2	Flood Risk
180 min Summer	99.741	1.241	0.4	3.1	Flood Risk
240 min Summer	99.680	1.180	0.4	3.0	O K
360 min Summer	99.566	1.066	0.4	2.7	O K
480 min Summer	99.469	0.969	0.4	2.4	O K
600 min Summer	99.385	0.885	0.4	2.2	O K
720 min Summer	99.309	0.809	0.3	2.0	O K
960 min Summer	99.182	0.682	0.3	1.7	O K
1440 min Summer	98.993	0.493	0.3	1.2	O K
2160 min Summer	98.805	0.305	0.2	0.8	O K
2880 min Summer	98.684	0.184	0.2	0.5	O K
4320 min Summer	98.558	0.058	0.2	0.1	O K
5760 min Summer	98.541	0.041	0.1	0.1	O K
7200 min Summer	98.534	0.034	0.1	0.1	O K
8640 min Summer	98.530	0.030	0.1	0.1	O K
10080 min Summer	98.526	0.026	0.1	0.1	O K
15 min Winter	99.514	1.014	0.4	2.6	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.394	0.0	23
30 min Summer	90.786	0.0	35
60 min Summer	56.713	0.0	60
120 min Summer	34.218	0.0	92
180 min Summer	25.118	0.0	126
240 min Summer	20.049	0.0	160
360 min Summer	14.556	0.0	228
480 min Summer	11.596	0.0	296
600 min Summer	9.714	0.0	360
720 min Summer	8.402	0.0	426
960 min Summer	6.677	0.0	552
1440 min Summer	4.823	0.0	798
2160 min Summer	3.478	0.0	1164
2880 min Summer	2.755	0.0	1524
4320 min Summer	1.981	0.0	2208
5760 min Summer	1.566	0.0	2880
7200 min Summer	1.304	0.0	3672
8640 min Summer	1.123	0.0	4368
10080 min Summer	0.989	0.0	5048
15 min Winter	138.394	0.0	23

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	99.771	1.271	0.4	3.2	Flood Risk
60 min Winter	99.938	1.438	0.5	3.6	Flood Risk
120 min Winter	99.956	1.456	0.5	3.7	Flood Risk
180 min Winter	99.895	1.395	0.5	3.5	Flood Risk
240 min Winter	99.810	1.310	0.5	3.3	Flood Risk
360 min Winter	99.643	1.143	0.4	2.9	O K
480 min Winter	99.506	1.006	0.4	2.5	O K
600 min Winter	99.388	0.888	0.4	2.2	O K
720 min Winter	99.287	0.787	0.3	2.0	O K
960 min Winter	99.121	0.621	0.3	1.6	O K
1440 min Winter	98.890	0.390	0.2	1.0	O K
2160 min Winter	98.679	0.179	0.2	0.5	O K
2880 min Winter	98.561	0.061	0.2	0.2	O K
4320 min Winter	98.538	0.038	0.1	0.1	O K
5760 min Winter	98.530	0.030	0.1	0.1	O K
7200 min Winter	98.525	0.025	0.1	0.1	O K
8640 min Winter	98.521	0.021	0.1	0.1	O K
10080 min Winter	98.519	0.019	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	90.786	0.0	35
60 min Winter	56.713	0.0	60
120 min Winter	34.218	0.0	96
180 min Winter	25.118	0.0	134
240 min Winter	20.049	0.0	172
360 min Winter	14.556	0.0	244
480 min Winter	11.596	0.0	314
600 min Winter	9.714	0.0	382
720 min Winter	8.402	0.0	448
960 min Winter	6.677	0.0	578
1440 min Winter	4.823	0.0	828
2160 min Winter	3.478	0.0	1192
2880 min Winter	2.755	0.0	1504
4320 min Winter	1.981	0.0	2208
5760 min Winter	1.566	0.0	2872
7200 min Winter	1.304	0.0	3648
8640 min Winter	1.123	0.0	4264
10080 min Winter	0.989	0.0	5112



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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.402	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.010

Time (mins) Area			Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	0.003	4	8	0.003	8	12	0.003


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Model Details

Storage is Online Cover Level (m) 100.000

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.18000	Ring Diameter (m)	1.20
Infiltration Coefficient Side (m/hr)	0.18000	Pit Multiplier	2.0
Safety Factor	2.0	Number Required	1
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	98.500	Cap Infiltration Depth (m)	0.000

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

Half Drain Time : 122 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.231	1.031	0.9	8.0	O K
30 min Summer	99.505	1.305	1.0	10.1	O K
60 min Summer	99.707	1.507	1.1	11.6	Flood Risk
120 min Summer	99.767	1.567	1.1	12.1	Flood Risk
180 min Summer	99.741	1.541	1.1	11.9	Flood Risk
240 min Summer	99.690	1.490	1.1	11.5	O K
360 min Summer	99.579	1.379	1.0	10.6	O K
480 min Summer	99.482	1.282	1.0	9.9	O K
600 min Summer	99.394	1.194	0.9	9.2	O K
720 min Summer	99.313	1.113	0.9	8.6	O K
960 min Summer	99.169	0.969	0.8	7.5	O K
1440 min Summer	98.939	0.739	0.8	5.7	O K
2160 min Summer	98.692	0.492	0.6	3.8	O K
2880 min Summer	98.520	0.320	0.6	2.5	O K
4320 min Summer	98.314	0.114	0.5	0.9	O K
5760 min Summer	98.247	0.047	0.4	0.4	O K
7200 min Summer	98.239	0.039	0.4	0.3	O K
8640 min Summer	98.234	0.034	0.3	0.3	O K
10080 min Summer	98.230	0.030	0.3	0.2	O K
15 min Winter	99.362	1.162	0.9	9.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.514	0.0	24
30 min Summer	90.826	0.0	37
60 min Summer	56.713	0.0	64
120 min Summer	34.204	0.0	102
180 min Summer	25.103	0.0	136
240 min Summer	20.035	0.0	170
360 min Summer	14.542	0.0	238
480 min Summer	11.583	0.0	308
600 min Summer	9.702	0.0	374
720 min Summer	8.391	0.0	442
960 min Summer	6.667	0.0	572
1440 min Summer	4.815	0.0	826
2160 min Summer	3.471	0.0	1192
2880 min Summer	2.749	0.0	1556
4320 min Summer	1.977	0.0	2248
5760 min Summer	1.563	0.0	2888
7200 min Summer	1.301	0.0	3632
8640 min Summer	1.120	0.0	4360
10080 min Summer	0.987	0.0	5040
15 min Winter	138.514	0.0	24

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	99.676	1.476	1.1	11.4	O K
60 min Winter	99.916	1.716	1.2	13.2	Flood Risk
120 min Winter	99.995	1.795	1.2	13.9	Flood Risk
180 min Winter	99.964	1.764	1.2	13.6	Flood Risk
240 min Winter	99.897	1.697	1.2	13.1	Flood Risk
360 min Winter	99.741	1.541	1.1	11.9	Flood Risk
480 min Winter	99.598	1.398	1.0	10.8	O K
600 min Winter	99.471	1.271	1.0	9.8	O K
720 min Winter	99.356	1.156	0.9	8.9	O K
960 min Winter	99.156	0.956	0.8	7.4	O K
1440 min Winter	98.852	0.652	0.7	5.0	O K
2160 min Winter	98.547	0.347	0.6	2.7	O K
2880 min Winter	98.352	0.152	0.5	1.2	O K
4320 min Winter	98.243	0.043	0.4	0.3	O K
5760 min Winter	98.234	0.034	0.3	0.3	O K
7200 min Winter	98.228	0.028	0.3	0.2	O K
8640 min Winter	98.225	0.025	0.2	0.2	O K
10080 min Winter	98.222	0.022	0.2	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	90.826	0.0	37
60 min Winter	56.713	0.0	64
120 min Winter	34.204	0.0	112
180 min Winter	25.103	0.0	142
240 min Winter	20.035	0.0	182
360 min Winter	14.542	0.0	256
480 min Winter	11.583	0.0	330
600 min Winter	9.702	0.0	400
720 min Winter	8.391	0.0	470
960 min Winter	6.667	0.0	606
1440 min Winter	4.815	0.0	864
2160 min Winter	3.471	0.0	1236
2880 min Winter	2.749	0.0	1584
4320 min Winter	1.977	0.0	2208
5760 min Winter	1.563	0.0	2936
7200 min Winter	1.301	0.0	3672
8640 min Winter	1.120	0.0	4328
10080 min Winter	0.987	0.0	5008

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.403	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.034

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.011		0.011		0.011


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Model Details

Storage is Online Cover Level (m) 100.000

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.18000	Ring Diameter (m)	2.10
Infiltration Coefficient Side (m/hr)	0.18000	Pit Multiplier	2.0
Safety Factor	2.0	Number Required	1
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	98.200	Cap Infiltration Depth (m)	0.000


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

Half Drain Time : 53 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.491	0.491	0.2	0.9	O K
30 min Summer	99.605	0.605	0.2	1.1	O K
60 min Summer	99.657	0.657	0.2	1.1	O K
120 min Summer	99.643	0.643	0.2	1.1	O K
180 min Summer	99.602	0.602	0.2	1.1	O K
240 min Summer	99.559	0.559	0.2	1.0	O K
360 min Summer	99.480	0.480	0.2	0.8	O K
480 min Summer	99.415	0.415	0.2	0.7	O K
600 min Summer	99.359	0.359	0.2	0.6	O K
720 min Summer	99.310	0.310	0.2	0.5	O K
960 min Summer	99.232	0.232	0.1	0.4	O K
1440 min Summer	99.127	0.127	0.1	0.2	O K
2160 min Summer	99.052	0.052	0.1	0.1	O K
2880 min Summer	99.041	0.041	0.1	0.1	O K
4320 min Summer	99.029	0.029	0.1	0.1	O K
5760 min Summer	99.023	0.023	0.1	0.0	O K
7200 min Summer	99.020	0.020	0.0	0.0	O K
8640 min Summer	99.017	0.017	0.0	0.0	O K
10080 min Summer	99.015	0.015	0.0	0.0	O K
15 min Winter	99.556	0.556	0.2	1.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.514	0.0	22
30 min Summer	90.826	0.0	34
60 min Summer	56.713	0.0	54
120 min Summer	34.204	0.0	88
180 min Summer	25.103	0.0	122
240 min Summer	20.035	0.0	156
360 min Summer	14.542	0.0	222
480 min Summer	11.583	0.0	286
600 min Summer	9.702	0.0	350
720 min Summer	8.391	0.0	412
960 min Summer	6.667	0.0	534
1440 min Summer	4.815	0.0	770
2160 min Summer	3.471	0.0	1104
2880 min Summer	2.749	0.0	1468
4320 min Summer	1.977	0.0	2204
5760 min Summer	1.563	0.0	2920
7200 min Summer	1.301	0.0	3648
8640 min Summer	1.120	0.0	4336
10080 min Summer	0.987	0.0	5128
15 min Winter	138.514	0.0	23

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	99.688	0.688	0.2	1.2	O K
60 min Winter	99.751	0.751	0.3	1.3	Flood Risk
120 min Winter	99.727	0.727	0.2	1.3	Flood Risk
180 min Winter	99.666	0.666	0.2	1.2	O K
240 min Winter	99.602	0.602	0.2	1.1	O K
360 min Winter	99.489	0.489	0.2	0.9	O K
480 min Winter	99.399	0.399	0.2	0.7	O K
600 min Winter	99.324	0.324	0.2	0.6	O K
720 min Winter	99.262	0.262	0.2	0.5	O K
960 min Winter	99.166	0.166	0.1	0.3	O K
1440 min Winter	99.054	0.054	0.1	0.1	O K
2160 min Winter	99.037	0.037	0.1	0.1	O K
2880 min Winter	99.030	0.030	0.1	0.1	O K
4320 min Winter	99.021	0.021	0.0	0.0	O K
5760 min Winter	99.017	0.017	0.0	0.0	O K
7200 min Winter	99.014	0.014	0.0	0.0	O K
8640 min Winter	99.012	0.012	0.0	0.0	O K
10080 min Winter	99.011	0.011	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	90.826	0.0	34
60 min Winter	56.713	0.0	56
120 min Winter	34.204	0.0	94
180 min Winter	25.103	0.0	130
240 min Winter	20.035	0.0	166
360 min Winter	14.542	0.0	236
480 min Winter	11.583	0.0	302
600 min Winter	9.702	0.0	366
720 min Winter	8.391	0.0	430
960 min Winter	6.667	0.0	550
1440 min Winter	4.815	0.0	756
2160 min Winter	3.471	0.0	1088
2880 min Winter	2.749	0.0	1468
4320 min Winter	1.977	0.0	2164
5760 min Winter	1.563	0.0	2936
7200 min Winter	1.301	0.0	3744
8640 min Winter	1.120	0.0	4352
10080 min Winter	0.987	0.0	5072



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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.403	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.004

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
	(ha)		(ha)		(ha)
0	4	4	8	8	12
	0.001		0.001		0.001


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Date 24/06/2019 10:40	Designed by agarcia	
File GARAGE EXISTING HOUSE.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr) 0.18000	Ring Diameter (m) 1.00
Infiltration Coefficient Side (m/hr) 0.18000	Pit Multiplier 2.0
Safety Factor 2.0	Number Required 1
Porosity 0.30	Cap Volume Depth (m) 0.000
Invert Level (m) 99.000	Cap Infiltration Depth (m) 0.000

Wardell Armstrong LLP		Page 1
Suite 2/3 Great Michael House 14 Links Place Edinburgh EH6 7EZ		
Date 24/06/2019 10:38 File DRIVEWAY EXISTING HOUSE...	Designed by agarcia Checked by	
XP Solutions		Source Control 2018.1

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

Half Drain Time : 7 minutes.


Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.893	0.043	9.7	5.8	Flood Risk
30 min Summer	99.898	0.048	10.7	6.4	Flood Risk
60 min Summer	99.895	0.045	10.2	6.1	Flood Risk
120 min Summer	99.887	0.037	8.4	5.0	Flood Risk
180 min Summer	99.881	0.031	7.0	4.2	Flood Risk
240 min Summer	99.877	0.027	6.0	3.6	Flood Risk
360 min Summer	99.871	0.021	4.7	2.8	Flood Risk
480 min Summer	99.867	0.017	3.9	2.3	Flood Risk
600 min Summer	99.865	0.015	3.3	2.0	Flood Risk
720 min Summer	99.863	0.013	3.0	1.8	Flood Risk
960 min Summer	99.861	0.011	2.4	1.4	Flood Risk
1440 min Summer	99.858	0.008	1.7	1.0	Flood Risk
2160 min Summer	99.856	0.006	1.3	0.8	Flood Risk
2880 min Summer	99.855	0.005	1.1	0.6	Flood Risk
4320 min Summer	99.853	0.003	0.7	0.4	Flood Risk
5760 min Summer	99.853	0.003	0.6	0.4	Flood Risk
7200 min Summer	99.852	0.002	0.5	0.3	Flood Risk
8640 min Summer	99.852	0.002	0.5	0.3	Flood Risk
10080 min Summer	99.852	0.002	0.4	0.2	Flood Risk
15 min Winter	99.898	0.048	10.7	6.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.514	0.0	19
30 min Summer	90.826	0.0	27
60 min Summer	56.713	0.0	42
120 min Summer	34.204	0.0	72
180 min Summer	25.103	0.0	102
240 min Summer	20.035	0.0	132
360 min Summer	14.542	0.0	194
480 min Summer	11.583	0.0	254
600 min Summer	9.702	0.0	314
720 min Summer	8.391	0.0	372
960 min Summer	6.667	0.0	492
1440 min Summer	4.815	0.0	736
2160 min Summer	3.471	0.0	1080
2880 min Summer	2.749	0.0	1464
4320 min Summer	1.977	0.0	2148
5760 min Summer	1.563	0.0	2936
7200 min Summer	1.301	0.0	3672
8640 min Summer	1.120	0.0	4360
10080 min Summer	0.987	0.0	5032
15 min Winter	138.514	0.0	19

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	99.902	0.052	11.3	7.0	Flood Risk
60 min Winter	99.896	0.046	10.3	6.2	Flood Risk
120 min Winter	99.884	0.034	7.7	4.6	Flood Risk
180 min Winter	99.877	0.027	6.0	3.6	Flood Risk
240 min Winter	99.872	0.022	5.0	3.0	Flood Risk
360 min Winter	99.867	0.017	3.8	2.2	Flood Risk
480 min Winter	99.863	0.013	3.0	1.8	Flood Risk
600 min Winter	99.861	0.011	2.5	1.5	Flood Risk
720 min Winter	99.860	0.010	2.2	1.3	Flood Risk
960 min Winter	99.858	0.008	1.7	1.0	Flood Risk
1440 min Winter	99.856	0.006	1.3	0.7	Flood Risk
2160 min Winter	99.854	0.004	1.0	0.6	Flood Risk
2880 min Winter	99.853	0.003	0.7	0.4	Flood Risk
4320 min Winter	99.853	0.003	0.6	0.3	Flood Risk
5760 min Winter	99.852	0.002	0.5	0.3	Flood Risk
7200 min Winter	99.852	0.002	0.4	0.2	Flood Risk
8640 min Winter	99.852	0.002	0.4	0.2	Flood Risk
10080 min Winter	99.851	0.001	0.3	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	90.826	0.0	27
60 min Winter	56.713	0.0	42
120 min Winter	34.204	0.0	74
180 min Winter	25.103	0.0	104
240 min Winter	20.035	0.0	134
360 min Winter	14.542	0.0	194
480 min Winter	11.583	0.0	258
600 min Winter	9.702	0.0	316
720 min Winter	8.391	0.0	378
960 min Winter	6.667	0.0	500
1440 min Winter	4.815	0.0	728
2160 min Winter	3.471	0.0	1084
2880 min Winter	2.749	0.0	1488
4320 min Winter	1.977	0.0	2156
5760 min Winter	1.563	0.0	3000
7200 min Winter	1.301	0.0	3704
8640 min Winter	1.120	0.0	4184
10080 min Winter	0.987	0.0	5168

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Suite 2/3 Great Michael House 14 Links Place Edinburgh EH6 7EZ		
Date 24/06/2019 10:38 File DRIVEWAY EXISTING HOUSE...	Designed by agarcia Checked by	
XP Solutions		Source Control 2018.1


Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.403	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.045

Time (mins) Area			Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	0.015	4	8	0.015	8	12	0.015


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Date 24/06/2019 10:38 File DRIVEWAY EXISTING HOUSE...	Designed by agarcia Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Infiltration Blanket Structure

Infiltration Coefficient Base (m/hr)	0.18000	Diameter/Width (m)	10.0
Safety Factor	2.0	Length (m)	45.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	99.850		


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Suite 2/3 Great Michael House 14 Links Place Edinburgh EH6 7EZ		
Date 24/06/2019 10:34 File ACCESS ROAD.SRCX	Designed by agarcia Checked by	
XP Solutions		Source Control 2018.1

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

Half Drain Time : 7 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	99.891	0.041	32.6	19.5	Flood Risk
30 min Summer	99.895	0.045	35.8	21.4	Flood Risk
60 min Summer	99.892	0.042	33.8	20.4	Flood Risk
120 min Summer	99.885	0.035	27.8	16.8	Flood Risk
180 min Summer	99.879	0.029	23.4	14.0	Flood Risk
240 min Summer	99.875	0.025	19.8	12.0	Flood Risk
360 min Summer	99.870	0.020	15.8	9.4	Flood Risk
480 min Summer	99.866	0.016	13.0	7.8	Flood Risk
600 min Summer	99.864	0.014	11.0	6.7	Flood Risk
720 min Summer	99.862	0.012	9.8	5.8	Flood Risk
960 min Summer	99.860	0.010	7.8	4.8	Flood Risk
1440 min Summer	99.857	0.007	5.8	3.5	Flood Risk
2160 min Summer	99.855	0.005	4.2	2.5	Flood Risk
2880 min Summer	99.854	0.004	3.4	2.0	Flood Risk
4320 min Summer	99.853	0.003	2.6	1.5	Flood Risk
5760 min Summer	99.853	0.003	2.2	1.2	Flood Risk
7200 min Summer	99.852	0.002	1.8	1.0	Flood Risk
8640 min Summer	99.852	0.002	1.4	0.8	Flood Risk
10080 min Summer	99.852	0.002	1.4	0.8	Flood Risk
15 min Winter	99.895	0.045	35.8	21.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.514	0.0	19
30 min Summer	90.826	0.0	27
60 min Summer	56.713	0.0	42
120 min Summer	34.204	0.0	72
180 min Summer	25.103	0.0	102
240 min Summer	20.035	0.0	134
360 min Summer	14.542	0.0	192
480 min Summer	11.583	0.0	254
600 min Summer	9.702	0.0	314
720 min Summer	8.391	0.0	374
960 min Summer	6.667	0.0	496
1440 min Summer	4.815	0.0	736
2160 min Summer	3.471	0.0	1104
2880 min Summer	2.749	0.0	1468
4320 min Summer	1.977	0.0	2204
5760 min Summer	1.563	0.0	2872
7200 min Summer	1.301	0.0	3720
8640 min Summer	1.120	0.0	4368
10080 min Summer	0.987	0.0	5136
15 min Winter	138.514	0.0	19

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Suite 2/3 Great Michael House 14 Links Place Edinburgh EH6 7EZ		
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XP Solutions		Source Control 2018.1

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	99.898	0.048	38.6	23.1	Flood Risk
60 min Winter	99.893	0.043	34.2	20.6	Flood Risk
120 min Winter	99.882	0.032	25.8	15.4	Flood Risk
180 min Winter	99.875	0.025	20.2	12.1	Flood Risk
240 min Winter	99.871	0.021	16.6	10.0	Flood Risk
360 min Winter	99.866	0.016	12.6	7.5	Flood Risk
480 min Winter	99.863	0.013	10.2	6.0	Flood Risk
600 min Winter	99.861	0.011	8.6	5.1	Flood Risk
720 min Winter	99.859	0.009	7.4	4.3	Flood Risk
960 min Winter	99.857	0.007	5.8	3.5	Flood Risk
1440 min Winter	99.855	0.005	4.2	2.5	Flood Risk
2160 min Winter	99.854	0.004	3.0	1.9	Flood Risk
2880 min Winter	99.853	0.003	2.6	1.5	Flood Risk
4320 min Winter	99.852	0.002	1.8	1.0	Flood Risk
5760 min Winter	99.852	0.002	1.4	0.8	Flood Risk
7200 min Winter	99.852	0.002	1.4	0.8	Flood Risk
8640 min Winter	99.851	0.001	1.0	0.6	Flood Risk
10080 min Winter	99.851	0.001	1.0	0.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	90.826	0.0	27
60 min Winter	56.713	0.0	42
120 min Winter	34.204	0.0	74
180 min Winter	25.103	0.0	104
240 min Winter	20.035	0.0	134
360 min Winter	14.542	0.0	192
480 min Winter	11.583	0.0	252
600 min Winter	9.702	0.0	318
720 min Winter	8.391	0.0	380
960 min Winter	6.667	0.0	502
1440 min Winter	4.815	0.0	748
2160 min Winter	3.471	0.0	1128
2880 min Winter	2.749	0.0	1448
4320 min Winter	1.977	0.0	2224
5760 min Winter	1.563	0.0	2800
7200 min Winter	1.301	0.0	3648
8640 min Winter	1.120	0.0	4184
10080 min Winter	0.987	0.0	4976



Suite 2/3 Great Michael House  
14 Links Place  
Edinburgh EH6 7EZ



Date 24/06/2019 10:34  
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Checked by

XP Solutions

Source Control 2018.1


Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.403	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.150

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.050		0.050		0.050

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Date 24/06/2019 10:34 File ACCESS ROAD.SRCX	Designed by agarcia Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Infiltration Blanket Structure

Infiltration Coefficient Base (m/hr)	0.18000	Diameter/Width (m)	8.0
Safety Factor	2.0	Length (m)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	99.850		

**APPENDIX C**  
**Thames Water Correspondence**

# Asset location search



## Property Searches

Wardell Armstrong LLP  
2 Devon Way  
Longbridge  
BIRMINGHAM  
B31 2TS

**Search address supplied**      The Beeches  
Heyford Road  
Steeple Aston  
Bicester  
OX25 4SN

**Your reference**                      The Beeches at Steeple Aston

**Our reference**                        ALS/ALS Standard/2019\_3931073

**Search date**                         3 January 2019

### Keeping you up-to-date

#### Notification of Price Changes

From 1 September 2018 Thames Water Property Searches will be increasing the price of its Asset Location Search in line with RPI at 3.23%.

For further details on the price increase please visit our website: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)  
Please note that any orders received with a higher payment prior to the 1 September 2018 will be non-refundable.



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



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



0845 070 9148



searchcode

**Search address supplied:** The Beeches, Heyford Road, Steeple Aston, Bicester, OX25  
4SN

Dear Sir / Madam

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

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

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

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

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

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

## Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

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

Email: [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)

Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)

## Waste Water Services

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

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

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

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

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

For your guidance:

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

## Clean Water Services

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

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

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

# Asset location search



# Property Searches

pressure test to be carried out for a fee.

For your guidance:

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

## **Payment for this Search**

A charge will be added to your suppliers account.

## Further contacts:

### Waste Water queries

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

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

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

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

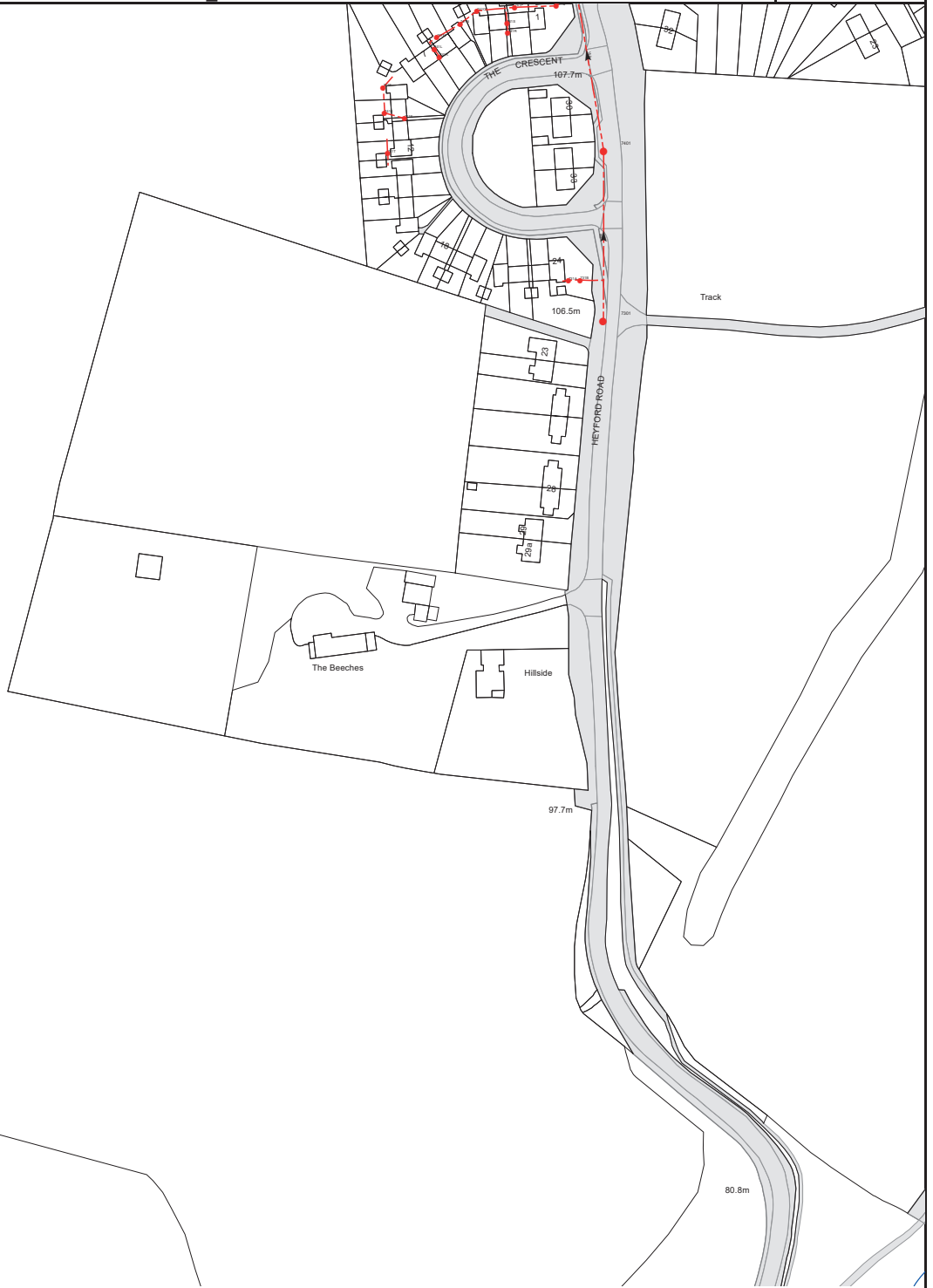
### Clean Water queries

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

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

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





The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 447667,225229

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

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
7301	106.95	103.94
731A	n/a	n/a
731B	n/a	n/a
7401	107.81	103.28
741E	n/a	n/a
741J	n/a	n/a
741F	n/a	n/a
741K	n/a	n/a
741L	n/a	n/a
741M	n/a	n/a
741R	n/a	n/a
741N	n/a	n/a
741S	n/a	n/a
741O	n/a	n/a
741P	n/a	n/a
741Q	n/a	n/a

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



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

**Scale:** 1:7161  
**Width:** 2000m  
**Printed By:** SAsirvat  
**Print Date:** 03/01/2019  
**Map Centre:** 447667,225229  
**Grid Reference:** SP4725SE

**Comments:**



# ALS Sewer Map Key

## Public Sewer Types (Operated & Maintained by Thames Water)

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

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

## Sewer Fittings

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

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

## Operational Controls

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

	Control Valve
	Drop Pipe
	Ancillary
	Weir

## End Items

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

	Outfall
	Undefined End
	Inlet

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

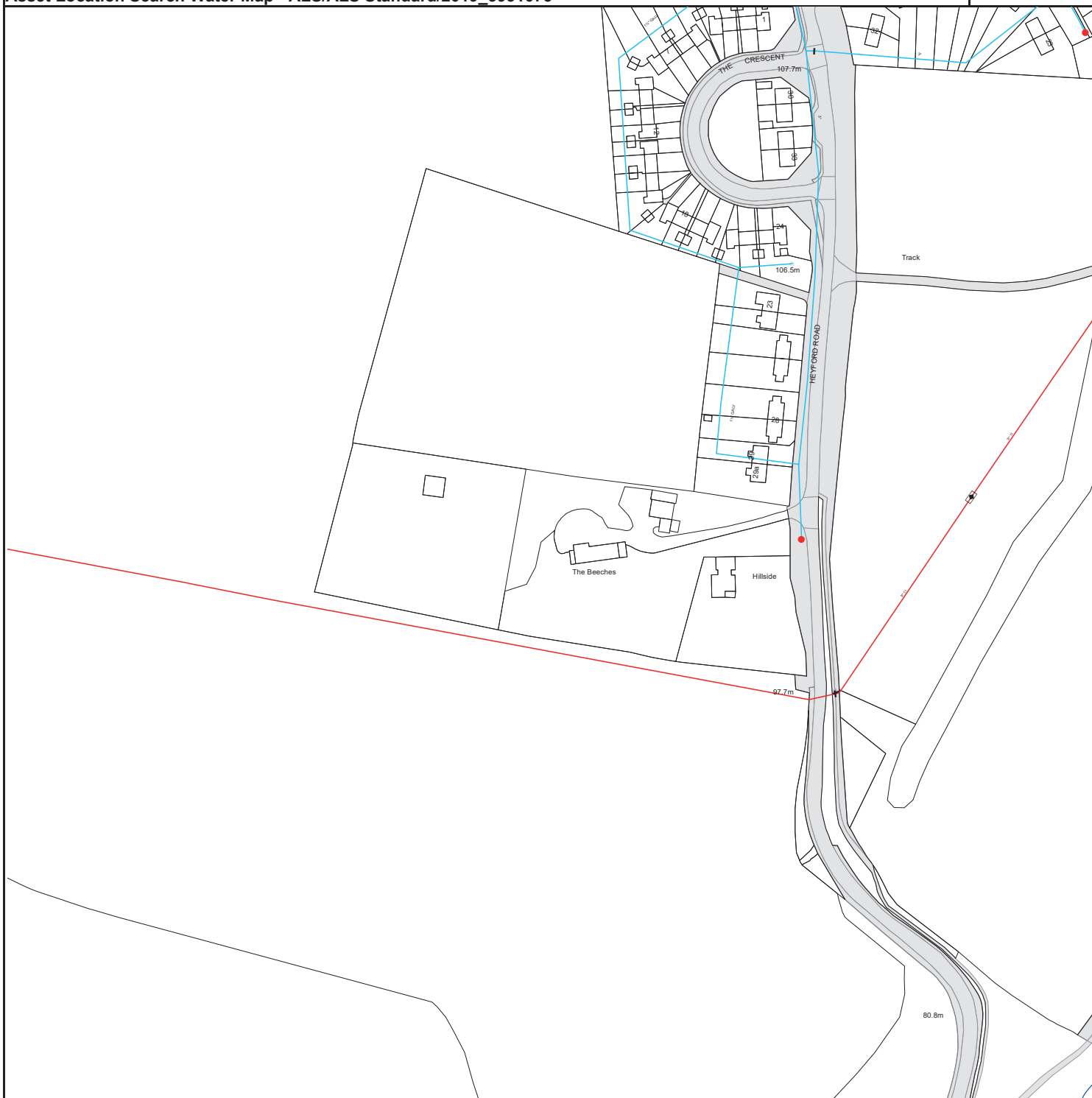
## Other Symbols

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

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit
<b>Areas</b>	Lines denoting areas of underground surveys, etc.
	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

## Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer		Surface Water Sewer
	Combined Sewer		Gully
	Culverted Watercourse		Proposed
			Abandoned Sewer



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 447667, 225229.

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

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# ALS Water Map Key

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

**4"** **Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

**16"** **Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

**3" SUPPLY** **Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.

**3" FIRE** **Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

**3" METERED** **Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

**Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

**Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

## Valves

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

## Hydrants

- Single Hydrant

## Meters

- Meter

## End Items

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

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

## Operational Sites

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

## Other Symbols

- Data Logger

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

**Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

**Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

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Credit Card	BACS Payment	Telephone Banking	Cheque
Call <b>0845 070 9148</b> quoting your invoice number starting CBA or ADS / OSS	Account number <b>90478703</b> Sort code <b>60-00-01</b> A remittance advice must be sent to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b> or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a>	By calling your bank and quoting: Account number <b>90478703</b> Sort code <b>60-00-01</b> and your invoice number	Made payable to ' <b>Thames Water Utilities Ltd</b> ' Write your Thames Water account number on the back. Send to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b> or by DX to <b>151280 Slough 13</b>

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#### TPOs Contact Details

The Property Ombudsman scheme  
Milford House  
43-55 Milford Street  
Salisbury  
Wiltshire SP1 2BP  
Tel: 01722 333306  
Fax: 01722 332296  
Web site: [www.tpos.co.uk](http://www.tpos.co.uk)  
Email: [admin@tpos.co.uk](mailto:admin@tpos.co.uk)

You can get more information about the PCCB from [www.propertycodes.org.uk](http://www.propertycodes.org.uk)

**PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE**





Mr Adrian Shooter  
The Beeches, Heyford Road  
Steeple Aston  
Bicester  
Oxfordshire  
OX25 4SN



04 February 2019

## Pre-planning enquiry: Confirmation of sufficient capacity

Dear Mr Shooter,

Thank you for providing information on your development:

The Beeches, Heyford Road, Steeple Aston, Bicester, Oxfordshire, OX25 4SN

**Existing:** 1 x 4 bedroom house discharging foul to a septic tank and surface water assumed to infiltrate.

**Proposed:** Development of 8 additional 3 and 5 bedroom houses to discharge foul water into the foul water manhole MH7301. Surface water to infiltrate to the ground.

We have completed the assessment of the foul water flows based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

**You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.**

### What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection.

If you've any further questions, please contact me on 0203 577 9811.

Yours sincerely

Siva Rajaratnam - Adoptions Engineer

Thames Water



## Planning your wastewater

We've put together some information on sewerage to help you plan your new development.

### How long does it take to get consent to connect to a sewer?

If you're applying for consent to connect to a sewer under Section 106 of the Water Industry Act 1991, you'll need to give us 21 days' notice.

### I think I'll need to connect to a trunk sewer – is that possible?

Connecting directly to trunk sewers can be complex and dangerous, and we won't permit this at all in London. If you're considering a trunk sewer as a point of connection, please contact us as soon as possible to discuss.

### How do I handle trade effluent and groundwater discharges?

You mustn't discharge non-domestic waste to our sewers without a valid trade effluent consent - doing this is an offence under Section 109(1) of the Water Industry Act 1991. You can call our trade effluent team on 0203 577 9200 to get help with trade effluent consents and ground water discharge permits.

### Where can I discharge surface water?

The Lead Local Flood Authority, or if you are in a London Borough, 'The London Plan', advises that your development should utilise sustainable drainage systems (SuDS) unless there are practical reasons for not doing so. You should aim to achieve greenfield run-off rates and ensure you manage surface water run-off as close to its source as possible in line with the following drainage hierarchy:

- 1 Store rainwater for later use.
- 2 Use infiltration techniques, such as porous surfaces in non-clay areas.
- 3 Attenuate rainwater in ponds or open water features for gradual release.
- 4 Attenuate rainwater by storing in tanks or sealed water features for gradual release.
- 5 Discharge rainwater direct to a watercourse.
- 6 Discharge rainwater to a surface water sewer or drain.
- 7 Discharge rainwater to a combined sewer.

Please note that if you're discharging surface water anywhere other than to a public sewer – such as to a watercourse – you'll need approval from the relevant authority, for example the Environment Agency, the local authority or the Canals and Rivers Trust.

If you don't follow the surface water hierarchy you may not be granted planning permission, and Thames Water may seek to put conditions on the planning application.

There's no right of discharge of highway drainage into the public sewerage system, and we'd need to agree this with the relevant highway authority under Section 115 of the Water Industry Act 1991. You can contact us to discuss this further.

### What can I do about redundant sewers and rising mains on my site?

On brownfield sites where existing sewers or rising mains need to be made redundant or diverted, the developer will need to fund the work, as set out in Section 185 of the Water Industry Act. If there's no practical way of making a diversion, we'll apply the standoff distances in Sewers for Adoption 7<sup>th</sup> edition to assess the width of easement required.

**APPENDIX D**  
**Typical Maintenance Schedule**

# Sustainable Drainage Systems (SuDS): Typical Maintenance Schedule

## Soakaway

Regular Maintenance	
Monthly	<ul style="list-style-type: none"> <li>• Mow grasses (where required) and remove resultant clippings (during growing season only)</li> <li>• Inspect/check all inlets, outlets, surface and overflows (where required) to ensure that they are in good condition, free from blockages and operating as designed. Take action where required</li> </ul>
Six Monthly	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>
Annually	<ul style="list-style-type: none"> <li>• Remove sediment and debris from pre-treatment devices and floor of chamber</li> <li>• Clean gutters and filters on downpipes (where applicable)</li> <li>• Trim any roots causing blockages</li> <li>• Inspect and document the presence of wildlife</li> </ul>
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events	
Following all significant storm events	<ul style="list-style-type: none"> <li>• Inspect and carry out essential recovery works to return the feature to full working order</li> </ul>

# Sustainable Drainage Systems (SuDS): Typical Maintenance Schedule

## Permeable Paving

Regular Maintenance	
Monthly	<ul style="list-style-type: none"> <li>• Refer to manufacturer specifications</li> <li>• For sealed systems, inspection of outfalls should be undertaken</li> </ul>
Six Monthly	<ul style="list-style-type: none"> <li>• Brushing and vacuuming to manufacturer requirements. Re-grit where necessary after brushing.</li> </ul>
Annually	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>
As Required	<ul style="list-style-type: none"> <li>• Inspect/check all inlets, outlets, inspection chambers, surface and overflows (where required) to ensure that they are in good condition, free from blockages and operating as designed. Take action where required (for 3 months following installation)</li> <li>• Removal of weeds where required</li> <li>• Stabilizing and mowing of contributing areas where required</li> </ul>
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events	
Following all significant storm events	<ul style="list-style-type: none"> <li>• Inspect and carry out essential recovery works to return the feature to full working order</li> </ul>

**DRAWING**









**DO NOT SCALE FROM THIS DRAWING**

**REFERENCE**

- SITE BOUNDARY
- EXISTING TW PUBLIC FOUL GRAVITY SEWER
- EXISTING TW FOUL WATER MANHOLE
- ACCESS ROAD INFILTRATION BLANKET, DEPTH 0.15m
- EXISTING HOUSE DRIVEWAY INFILTRATION BLANKET, DEPTH 0.15m
- ON PLOT SOAKAWAYS, SEE NOTES FOR DETAILS
- PROPOSED FOUL WATER PUMPING STATION
- PROPOSED GROUND SCRAPING
- PROPOSED DROP KERB
- PROPOSED RISING MAIN
- DIRECTION OF EXISTING GROUND FALL

**NOTES**

- LAYOUT BASED ON SCHEME 3 - INDICATIVE SITE PLAN BY MALCOLM PAYNE GROUP, DRG NO. 372A01 101 - REVISION B

**ON PLOT SOAKAWAYS:**

**PLOTS 1 TO 6**  
SURFACE AREA = 2.4m x 2.4m  
INFILTRATION RATE = 1.2m  
DEPTH = 1.5m.

**PLOTS 7 TO 9**  
SURFACE AREA = 4.2m x 4.2m  
INFILTRATION RATE = 2.10m  
DEPTH = 1.8m.

**EXISTING HOUSE GARAGE, SOAKAWAY**  
SURFACE AREA = 2m x 2m  
INFILTRATION RATE = 1m  
DEPTH = 1m.

**ON PLOT SOAKAWAYS AND INFILTRATION BLANKETS HAVE BEEN DESIGNED WITH AN ASSUMED INFILTRATION RATE OF 5x10<sup>-3</sup> TMS SUBJECT TO DETAILED SOAKAWAY TEST.**

B	Masterplan Update	DATE	REV
A	First Issue	DATE	REV
ISSUED	DATE	DATE	DATE
CLIENT	NAME	DATE	DATE

**MR ADRIAN SHOOTER**

**PROJECT**  
THE BEECHES AT STEEPLE ASTON

**DRAWING TITLE**  
DRAINAGE STRATEGY PLAN

DRG NO.	REV	DATE
BM11730-002	B	12/03/19
SCALE	CHECKED BY	APPROVED BY
A2	AG	KW
DATE	DATE	DATE
1:1000	12/03/19	12/03/19

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BRISBANE TEL: 012 363 9000  
WWW.WARDELLARMSTRONG.COM

BALTON  
GARDYF  
MANCHESTER  
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GLASGOW  
STOKE ON TRENT



**STOKE-ON-TRENT**

Sir Henry Doulton House  
Forge Lane  
Etruria  
Stoke-on-Trent  
ST1 5BD  
Tel: +44 (0)178 227 6700

**BIRMINGHAM**

Two Devon Way  
Longbridge Technology Park  
Longbridge  
Birmingham  
B31 2TS  
Tel: +44 (0)121 580 0909

**CARDIFF**

Tudor House  
16 Cathedral Road  
Cardiff  
CF11 9LJ  
Tel: +44 (0)292 072 9191

**CARLISLE**

Marconi Road  
Burgh Road Industrial Estate  
Carlisle  
Cumbria  
CA2 7NA  
Tel: +44 (0)122 855 0575

**EDINBURGH**

Great Michael House  
14 Links Place  
Edinburgh  
EH6 7EZ  
Tel: +44 (0)131 555 3311

**GLASGOW**

2 West Regent Street  
Glasgow  
G2 1RW  
Tel: +44 (0)141 433 7210

**LONDON**

46 Chancery Lane  
London  
WC2A 1JE  
Tel: +44 (0)207 242 3243

**MANCHESTER (City Centre)**

76 King Street  
Manchester  
M2 4NH  
Tel: +44 (0)161 817 5038

**MANCHESTER (Greater)**

41-50 Futura Park  
Aspinall Way  
Middlebrook  
Bolton  
BL6 6SU  
Tel: +44 (0)120 422 7227

**NEWCASTLE UPON TYNE**

City Quadrant  
11 Waterloo Square  
Newcastle Upon Tyne  
NE1 4DP  
Tel: +44 (0)191 232 0943

**SHEFFIELD**

Unit 5  
Newton Business Centre  
Newton Chambers Road  
Thornccliffe Park  
Chapelton  
Sheffield  
S35 2PH  
Tel: +44 (0)114 245 6244

**TRURO**

Baldhu House  
Wheal Jane Earth Science Park  
Baldhu  
Truro  
TR3 6EH  
Tel: +44 (0)187 256 0738

International offices:

**ALMATY**

29/6 Satpaev Avenue  
Regency Hotel Office Tower  
Almaty  
Kazakhstan  
050040  
Tel: +7(727) 334 1310

**MOSCOW**

21/5 Kuznetskiy Most St.  
Moscow  
Russia  
Tel: +7(495) 626 07 67