Asset location search

Property Searches

Fairhurst GGA
Fairhurst GGA Fairhurst GGA

LONDON
SE1 9EA

Search address supplied Manor Road
Richmond
TW9 1YB

Your reference 126782

Our reference ALS/ALS Standard/2018_3818642

Search date 19 June 2018

Keeping you up-to-date

Knowledge of features below the surface is essential in every development. The benefits of this not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility for any commercial or residential project.

An asset location search provides information on the location of known Thames Water clean and/or wastewater assets, including details of pipe sizes, direction of flow and depth. Please note that information on cover and invert levels will only be provided where the data is available.

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

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

searchcode

Asset location search

Property Searches

Search address supplied: Manor Road, Richmond, TW9 1YB

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 searchprovides 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
Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

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

TQ1875SE
TQ1975NW
TQ1975SW
TQ1875NE

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.

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

TQ1875SE
TQ1975NW

Asset location search

Thames Water Property Searches

TQ1975SW
TQ1875NE

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

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

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

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

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

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

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

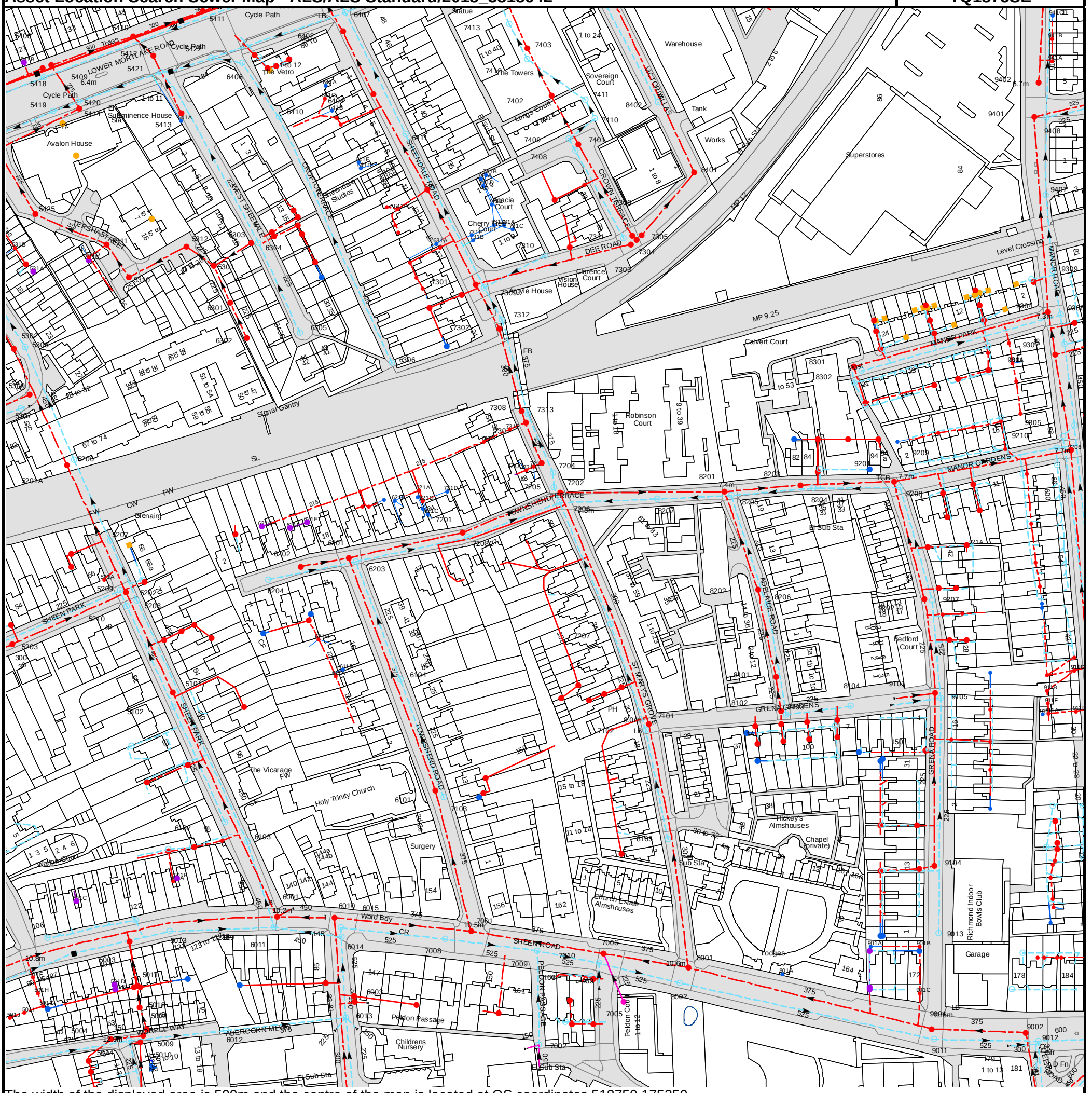
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

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

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2018_3818642

TQ1875SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 518750,175250

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.

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
90YQ	n/a	n/a
91QS	n/a	n/a
91SP	n/a	n/a
91QZ	n/a	n/a
93RT	n/a	n/a
93YZ	n/a	n/a
93ZT	n/a	n/a
92ZQ	n/a	n/a
93GY	n/a	n/a
93FZ	n/a	n/a
92EV	n/a	n/a
92PV	n/a	n/a
92PW	n/a	n/a
92PX	n/a	n/a
92PY	n/a	n/a
92RS	n/a	n/a
92PZ	n/a	n/a
9210	7.62	6.45
92AA	n/a	n/a
9305	n/a	n/a
9206	7.8	3.86
9306	7.68	6.33
9012	12.07	7.88
9011	11.61	8.09
9002	12.05	8.99
9001	11.58	8.1
90XT	n/a	n/a
90TR	n/a	n/a
90ZW	n/a	n/a
90YS	n/a	n/a
n/a	n/a	n/a
90YR	n/a	n/a
90TZ	n/a	n/a
91XV	n/a	n/a
90ZT	n/a	n/a
91VT	n/a	n/a
91WX	n/a	n/a
90ZY	n/a	n/a
91ZL	n/a	n/a
91VS	n/a	n/a
91XT	n/a	n/a
90VQ	n/a	n/a
9104	9.95	7.31
9013	10.38	8.72
91ZR	n/a	n/a
90YP	n/a	n/a
91SQ	n/a	n/a
90WT	n/a	n/a
90WV	n/a	n/a
91RV	n/a	n/a
90WW	n/a	n/a
91SV	n/a	n/a
91ST	n/a	n/a
91RY	n/a	n/a
91SS	n/a	n/a
91RX	n/a	n/a
8301	6.98	5.31
931A	n/a	n/a
9301	7.4	3.79
93SW	n/a	n/a
93XY	n/a	n/a
93YR	n/a	n/a
93RR	n/a	n/a
9307	7.25	n/a
93IW	n/a	n/a
93XS	n/a	n/a
93WZ	n/a	n/a
93XZ	n/a	n/a
93AB	n/a	n/a
93TY	n/a	n/a
93XP	n/a	n/a
93VW	n/a	n/a
93YP	n/a	n/a
9308	n/a	n/a
9304	7.34	3.71
93XQ	n/a	n/a
93TZ	n/a	n/a
93VP	n/a	n/a
93TP	n/a	n/a
93TR	n/a	n/a
81WX	n/a	n/a
8104	8.59	6.27
81ZX	n/a	n/a
91VY	n/a	n/a
91WZ	n/a	n/a
91SZ	n/a	n/a
91TX	n/a	n/a
9101	8.82	7.07
9105	8.77	6.72
92WS	n/a	n/a
92WY	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
91ZT	n/a	n/a
92WT	n/a	n/a
92XQ	n/a	n/a
91ZY	n/a	n/a
91ZP	n/a	n/a
91ZN	n/a	n/a
91ZW	n/a	n/a
91YY	n/a	n/a
91PS	n/a	n/a
9309	7.25	5.5
9407	6.58	5.23
9408	6.75	5.17
9401	6.65	1.26
9402	6.5	4.15
941A	n/a	n/a
941B	n/a	n/a
941C	n/a	n/a
901C	n/a	n/a
901A	n/a	n/a
901B	n/a	n/a
90WX	n/a	n/a
911E	n/a	n/a
911A	n/a	n/a
911D	n/a	n/a
911F	n/a	n/a
911B	n/a	n/a
91PW	n/a	n/a
911G	n/a	n/a
911C	n/a	n/a
9207	8.19	6.23
9202	8.11	6.9
92VZ	n/a	n/a
92VY	n/a	n/a
92VT	n/a	n/a
92VV	n/a	n/a
921A	n/a	n/a
92SY	n/a	n/a
92TQ	n/a	n/a
92SX	n/a	n/a
9208	7.63	5.59
83ZY	n/a	n/a
83ZQ	n/a	n/a
8302	6.98	6.13
83ZT	n/a	n/a
83ZR	n/a	n/a
92ZS	n/a	n/a
93ZY	n/a	n/a
9201	7.65	4.2
92ZR	n/a	n/a
9209	7.61	6.79
93ST	n/a	n/a
93ZW	n/a	n/a
93SY	n/a	n/a
92TP	n/a	n/a
93ZV	n/a	n/a
93SX	n/a	n/a
801A	n/a	n/a
7102	8.1	5.94
7101	8.06	6.31
8207	7.26	4.06
8201	7.33	4.33
8205	7.35	5.09
81ZP	n/a	n/a
81XW	n/a	n/a
81ZV	n/a	n/a
81XX	n/a	n/a
8202	7.81	5.73
8206	7.92	5.95
8101	8.18	6.12
81XS	n/a	n/a
8102	8.38	6.69
81XT	n/a	n/a
8103	8.4	6.27
83ZW	n/a	n/a
8203	n/a	n/a
81XP	n/a	n/a
81XQ	n/a	n/a
8204	7.37	5.41
83ZX	n/a	n/a
82ZT	n/a	n/a
82ZQ	n/a	n/a
81ZR	n/a	n/a
81WY	n/a	n/a
81ZS	n/a	n/a
7303	6.33	5.06
7306	6.32	5.05
7304	6.34	5.12
7305	6.32	5.14
8402	6.16	4.54
8401	6.19	4.82
73ZS	n/a	n/a
73ZQ	n/a	n/a
721D	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
73YZ	n/a	n/a
731E	n/a	n/a
731B	n/a	n/a
7301	6.57	4.66
731G	n/a	n/a
7309	7.97	4.49
731D	n/a	n/a
7302	7.21	4.81
7312	6.76	4.49
731A	n/a	n/a
731F	n/a	n/a
731C	n/a	n/a
7308	6.81	5.23
7307	6.86	5.28
721A	n/a	n/a
7313	6.78	4.55
721C	n/a	n/a
7203	7	5.51
7310	6.25	5
7204	6.91	4.72
7205	7.05	4.74
7202	7.11	4.54
73ZY	n/a	n/a
7311	6.26	4.79
60ZT	n/a	n/a
6101	8.29	5.62
7103	8.41	6.79
7008	10.51	n/a
7001	10.5	6.01
71YW	n/a	n/a
71YV	n/a	n/a
71YS	n/a	n/a
70ZX	n/a	n/a
7009	10.69	8.29
7002	12.35	10.89
70ZR	n/a	n/a
70YY	n/a	n/a
70YX	n/a	n/a
70ZP	n/a	n/a
70XX	n/a	n/a
70YW	n/a	n/a
70YQ	n/a	n/a
7010	10.61	8.25
7006	10.55	7.05
71ZQ	n/a	n/a
7005	11.32	10.06
8105	9.01	6.71
8002	10.6	8.11
8001	10.53	7.38
62ZX	n/a	n/a
62ZS	n/a	n/a
62ZQ	n/a	n/a
621B	n/a	n/a
6104	7.42	5.69
621D	n/a	n/a
6205	n/a	n/a
621C	n/a	n/a
7201	7.11	4.12
7208	7.17	5.04
7206	7.19	4.18
71ZY	n/a	n/a
71ZX	n/a	n/a
71ZV	n/a	n/a
71ZT	n/a	n/a
7207	7.62	5.66
71ZS	n/a	n/a
64ZX	n/a	n/a
6402	6.3	5.98
6407	6.44	3.95
641E	n/a	n/a
641D	n/a	n/a
64ZW	n/a	n/a
6404	6.34	4.16
6411	6.41	4.28
6405	6.46	4.41
741A	n/a	n/a
741D	n/a	n/a
741B	n/a	n/a
741E	n/a	n/a
7413	6.35	4.24
7412	6.3	4.39
7403	6.3	4.55
7402	6.25	4.75
74ZX	n/a	n/a
7409	6.32	4.57
7408	6.19	4.59
7401	6.18	4.83
74ZW	n/a	n/a
7411	6.52	4.48
7410	6.49	4.53
5301	6.94	4.35
6301	6.9	4.77
6302	6.87	5.04

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6303	6.9	4.48
6304	6.85	4.84
63ZT	n/a	n/a
63YY	n/a	n/a
64WP	n/a	n/a
63YZ	n/a	n/a
64VZ	n/a	n/a
6305	6.96	5.44
63ZP	n/a	n/a
63ZQ	n/a	n/a
63ZR	n/a	n/a
62ZV	n/a	n/a
6412	n/a	n/a
6306	6.73	5.53
6308	n/a	n/a
641F	n/a	n/a
6307	n/a	n/a
63ZW	n/a	n/a
63ZX	n/a	n/a
62YP	n/a	n/a
621A	n/a	n/a
63ZY	n/a	n/a
63ZV	n/a	n/a
631A	n/a	n/a
61ZV	n/a	n/a
611A	n/a	n/a
611B	n/a	n/a
621H	n/a	n/a
52YV	n/a	n/a
62XZ	n/a	n/a
62XX	n/a	n/a
62XW	n/a	n/a
6204	7.06	5.53
6202	7.01	5.19
6203	7.19	5.26
6201	7.09	4.95
62YZ	n/a	n/a
621F	n/a	n/a
621G	n/a	n/a
621E	n/a	n/a
501E	n/a	n/a
50XY	n/a	n/a
50YS	n/a	n/a
5011	n/a	n/a
60ZY	n/a	n/a
501D	n/a	n/a
60ZW	n/a	n/a
50YP	n/a	n/a
5003	10.32	7.93
6014	10.31	8.48
5013	12.92	10.65
6015	10.24	8.31
6011	10.03	6.45
50XP	n/a	n/a
6010	10.15	6.49
6001	10	5.98
501C	n/a	n/a
501A	n/a	n/a
501B	n/a	n/a
51ZR	n/a	n/a
51YY	n/a	n/a
51YX	n/a	n/a
51ZQ	n/a	n/a
6103	8.74	6.16
61ZP	n/a	n/a
6102	8.41	6.97
51WV	n/a	n/a
50ZR	n/a	n/a
50ZW	n/a	n/a
5004	12.81	11.72
5014	12.82	10.69
5012	n/a	n/a
5010	n/a	n/a
5009	12.8	11.73
5008	12.77	11.49
6012	12.95	10.65
6013	12.27	10.34
60ZS	n/a	n/a
6003	11.8	8.93
531B	n/a	n/a
541B	n/a	n/a
53ZY	n/a	n/a
5425	6.57	3.675

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.

Asset Location Search Sewer Map - ALS/ALS Standard/2018_3818642

TQ1975NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 519250,175750

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.

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
4705	6.05	4.6
4711	5.98	3.8
48ZY	n/a	n/a
4905	6.12	4.77
4901	6.16	5.37
4803	6.22	5.28
4902	6.14	5.12
491D	n/a	n/a
481E	n/a	n/a
491B	n/a	n/a
481F	n/a	n/a
491C	n/a	n/a
491A	n/a	n/a
4807	6.13	5.16
4802	6.11	5.02
4805	6.19	4.67
4804	6.33	4.73
4801	6.33	5.37
4903	6.12	4.83
4904	6.11	4.46
3703	6.1	5.26
3708	6.28	2.93
3704	6.41	3.08
3706	6.11	4.9
37ZX	n/a	n/a
47ZX	n/a	n/a
47ZV	n/a	n/a
4703	6	4.38
47YZ	n/a	n/a
4708	6.02	4.18
4701	n/a	-4.66
47YY	n/a	n/a
47YX	n/a	n/a
4707	5.77	n/a
4706	5.95	3.86
2506	6.38	5.16
2514	6.41	2.59
3501	6.37	3.84
35YQ	n/a	n/a
35YX	n/a	n/a
35YR	n/a	n/a
35YY	n/a	n/a
35YZ	n/a	n/a
35YS	n/a	n/a
35ZP	n/a	n/a
35YT	n/a	n/a
35ZQ	n/a	n/a
35ZY	n/a	n/a
35YP	n/a	n/a
35XZ	n/a	n/a
35ZX	n/a	n/a
35XY	n/a	n/a
35ZW	n/a	n/a
35ZV	n/a	n/a
35ZT	n/a	n/a
35XX	n/a	n/a
35XW	n/a	n/a
2516	n/a	n/a
2511	6.26	4.43
0507	n/a	5.09
2515	n/a	n/a
2512	6.31	4.34
0508	n/a	5.04
39WP	n/a	n/a
0901A	6.45	4.59
39VX	n/a	n/a
39YX	n/a	n/a
39ZS	n/a	n/a
39YR	n/a	n/a
391A	n/a	n/a
39YZ	n/a	n/a
39YV	n/a	n/a
39XP	n/a	n/a
39YT	n/a	n/a
39XV	n/a	n/a
39WQ	n/a	n/a
39ZQ	n/a	n/a
39XR	n/a	n/a
39ZP	n/a	n/a
39XS	n/a	n/a
39WS	n/a	n/a
3801	6.27	5.33
3806	6.22	4.88
481A	n/a	n/a
481D	n/a	n/a
4806	6.2	4.98
481C	n/a	n/a
481B	n/a	n/a
0805	6.37	3.53
0903	6.28	4.76

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0902	6.33	4.8
0906	6.35	3.61
08ZY	n/a	n/a
08WV	n/a	n/a
0907	6.41	3.72
09ZY	n/a	n/a
09ZW	n/a	n/a
08ZW	n/a	n/a
18WP	n/a	n/a
191D	n/a	n/a
18VW	n/a	n/a
191C	n/a	n/a
18VR	n/a	n/a
19ZX	n/a	n/a
18QX	n/a	n/a
18TY	n/a	n/a
19ZR	n/a	n/a
18RY	n/a	n/a
18YV	n/a	n/a
19WZ	n/a	n/a
19ZY	n/a	n/a
18TW	n/a	n/a
18VT	n/a	n/a
191G	n/a	n/a
1806	6.36	4.05
18WV	n/a	n/a
18WX	n/a	n/a
18ZP	n/a	n/a
181A	n/a	n/a
18YY	n/a	n/a
18ZS	n/a	n/a
18ZR	n/a	n/a
1803	6.33	4.65
1801	n/a	-5.11
1805	6.36	3.83
1804	6.33	4.96
19YS	n/a	n/a
19YQ	n/a	n/a
1906	6.4	3.97
19YP	n/a	n/a
19XT	n/a	n/a
19XS	n/a	n/a
19WX	n/a	n/a
19ZV	n/a	n/a
19VV	n/a	n/a
19VT	n/a	n/a
19VW	n/a	n/a
191F	n/a	n/a
191E	n/a	n/a
19VX	n/a	n/a
1904	6.88	4.85
1901	n/a	-5.16
1903	6.72	5.39
2801	6.23	5.26
28YY	n/a	n/a
28QS	n/a	n/a
38XY	n/a	n/a
38XW	n/a	n/a
38YQ	n/a	n/a
38XQ	n/a	n/a
38XS	n/a	n/a
38ZV	n/a	n/a
38YS	n/a	n/a
381A	n/a	n/a
38ZP	n/a	n/a
38ZY	n/a	n/a
3902	6.38	5.11
3901	6.42	4.67
3803	6.49	5.4
3807	6.47	4.51
39YQ	n/a	n/a
3802	6.48	4.86
3804	6.46	4.83
3805	6.35	4.95
391B	n/a	n/a
39WZ	n/a	n/a
39XY	n/a	n/a
39VT	n/a	n/a
39WW	n/a	n/a
38VV	n/a	n/a
19VZ	n/a	n/a
28ZX	n/a	n/a
28SW	n/a	n/a
29ZX	n/a	n/a
29SS	n/a	n/a
28SV	n/a	n/a
28ZW	n/a	n/a
29ZW	n/a	n/a
28TQ	n/a	n/a
28ZR	n/a	n/a
29ZS	n/a	n/a
29ZV	n/a	n/a
2805	6.34	4.51

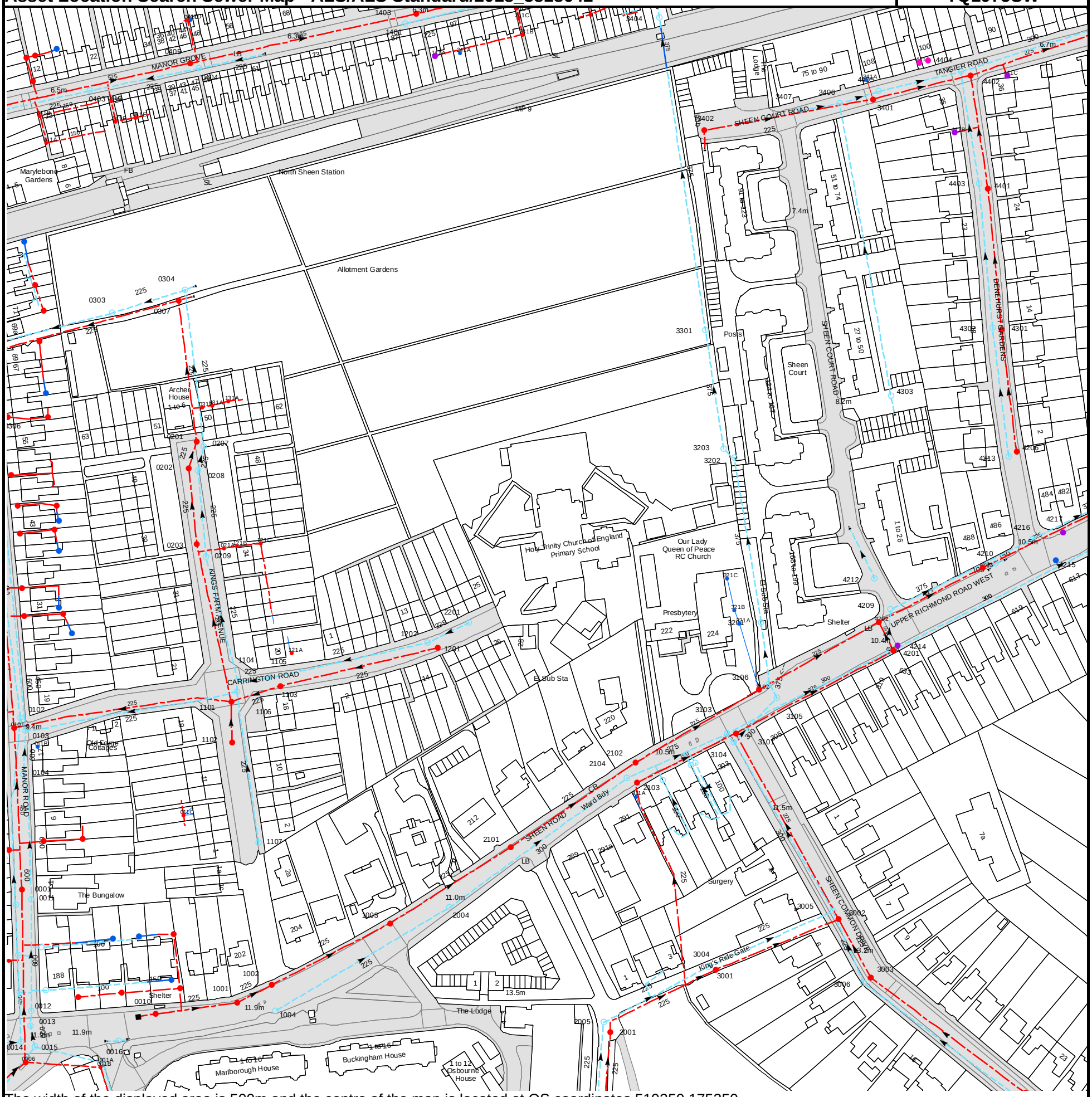
Manhole Reference	Manhole Cover Level	Manhole Invert Level
2804	6.32	5.16
2809	6.35	4.19
291A	n/a	n/a
2810	6.29	4.28
281B	n/a	n/a
2901	6.58	5.47
2902	6.65	5.07
2803	6.38	4.34
2802	6.33	5.23
28XZ	n/a	n/a
2807	6.33	4.96
28YP	n/a	n/a
28YW	n/a	n/a
28QR	n/a	n/a
17WZ	n/a	n/a
17WP	n/a	n/a
17XP	n/a	n/a
17VS	n/a	n/a
07ZX	n/a	n/a
07ZP	n/a	n/a
07ZW	n/a	n/a
07YZ	n/a	n/a
0706	6.89	3.18
17VV	n/a	n/a
17WX	n/a	n/a
07ZS	n/a	n/a
07ZY	n/a	n/a
18RV	n/a	n/a
081E	n/a	n/a
08YP	n/a	n/a
18SR	n/a	n/a
08ZQ	n/a	n/a
18SQ	n/a	n/a
18RR	n/a	n/a
08ZS	n/a	n/a
08YW	n/a	n/a
081B	n/a	n/a
0801	6.52	5.51
08YV	n/a	n/a
18RW	n/a	n/a
0804	6.52	3.37
08ZT	n/a	n/a
1703	6.62	4.51
18RQ	n/a	n/a
18SP	n/a	n/a
1802	6.36	5.24
1701	n/a	-5.05
1807	6.37	4.23
18PS	n/a	n/a
18CX	n/a	n/a
17SW	n/a	n/a
17RS	n/a	n/a
17QQ	n/a	n/a
17SS	n/a	n/a
18PT	n/a	n/a
18BZ	n/a	n/a
18PR	n/a	n/a
18DS	n/a	n/a
17XZ	n/a	n/a
17YP	n/a	n/a
17ZV	n/a	n/a
17YR	n/a	n/a
17XX	n/a	n/a
17XV	n/a	n/a
18YQ	n/a	n/a
18XZ	n/a	n/a
18XY	n/a	n/a
18YP	n/a	n/a
18XV	n/a	n/a
0807	6.78	n/a
0802	6.41	5.07
0806	6.65	3.4
08WQ	n/a	n/a
081D	n/a	n/a
08VZ	n/a	n/a
071A	n/a	n/a
0705	7.14	3.1
0702	7.15	5.72
3707	6.12	5.21
371A	n/a	n/a
37YT	n/a	n/a
37ZV	n/a	n/a
37ZW	n/a	n/a
37ZT	n/a	n/a
37ZQ	n/a	n/a
27TZ	n/a	n/a
37YV	n/a	n/a
37YY	n/a	n/a
37YZ	n/a	n/a
37YQ	n/a	n/a
37YX	n/a	n/a
38VQ	n/a	n/a
38WW	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
38WZ	n/a	n/a
38WY	n/a	n/a
3808	6.25	4.88
38VZ	n/a	n/a
28RP	n/a	n/a
38WT	n/a	n/a
38WR	n/a	n/a
38WS	n/a	n/a
28QX	n/a	n/a
28TZ	n/a	n/a
28QV	n/a	n/a
38ZW	n/a	n/a
38ZQ	n/a	n/a
18XS	n/a	n/a
18XR	n/a	n/a
18XW	n/a	n/a
17ZY	n/a	n/a
28TY	n/a	n/a
28WQ	n/a	n/a
2702	6.52	5.45
28WS	n/a	n/a
28WZ	n/a	n/a
28TX	n/a	n/a
28WP	n/a	n/a
2806	6.39	5.27
2811	6.44	4.43
27WW	n/a	n/a
27XW	n/a	n/a
27XY	n/a	n/a
27XQ	n/a	n/a
27VW	n/a	n/a
27WR	n/a	n/a
27WP	n/a	n/a
281A	n/a	n/a
27VQ	n/a	n/a
2703	6.28	4.07
2808	6.35	4.42
28QZ	n/a	n/a
28PZ	n/a	n/a
27TX	n/a	n/a
3705	6.01	3.14
3602	5.84	3.53
3601	5.81	3.37
361C	n/a	n/a
3709	6.12	4.65
361D	n/a	n/a
361B	n/a	n/a
461I	n/a	n/a
4704	6.11	4.76
4709	6.13	4.75
461H	n/a	n/a
461J	n/a	n/a
4601	5.69	3.93
4602	5.69	3.45
461L	n/a	n/a
461K	n/a	n/a
461B	n/a	n/a
461C	n/a	n/a
4710	6.07	4.45
2608	6.07	2.36
2605	6.08	4.51
361A	n/a	n/a
2602	6.27	4.06
2606	6.2	4.43
261A	n/a	n/a
261B	n/a	n/a
2603	6.39	3.84
2607	6.42	2.79
2604	6.43	3.61
2601	n/a	-4.42
3701	n/a	-4.54
2707	n/a	n/a
2704	n/a	n/a
2701	n/a	n/a
27WY	n/a	n/a
27XS	n/a	n/a
2705	n/a	n/a
27WZ	n/a	n/a
27XT	n/a	n/a
27WT	n/a	n/a
27VT	n/a	n/a
27VZ	n/a	n/a
27VS	n/a	n/a
27VY	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.

Asset Location Search Sewer Map - ALS/ALS Standard/2018_3818642

TQ1975SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 519250,175250

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.

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
3005	12.69	9.59
3002	12.7	9.4
3006	13.66	11.73
3003	13.63	11.09
3106	10.44	7.55
3105	10.35	7.82
4212	9.74	7.91
4202	10.35	8.04
4208	10.46	8.53
4209	10.35	7.57
4303	n/a	n/a
4201	10.47	8.11
4214	n/a	n/a
4203	10.36	7.94
4210	10.25	8.91
4213	8.2	6.43
4206	8.14	6.56
4216	n/a	n/a
4215	n/a	n/a
4217	n/a	n/a
3404	n/a	n/a
3402	6.57	5.35
3301	n/a	n/a
3203	n/a	n/a
3202	n/a	n/a
0010	11.99	8.94
00YS	n/a	n/a
00XT	n/a	n/a
00XS	n/a	n/a
011C	n/a	n/a
1001	12.01	8.44
1107	n/a	n/a
1002	11.76	8.81
1004	12.14	11.15
1003	9.51	8.95
2004	10.89	9.51
2101	10.72	8.43
2005	12.94	10.22
2001	12.98	10.16
2104	10.34	8.95
211A	n/a	n/a
2103	10.53	9.36
31LL	n/a	n/a
3004	11.09	9.9
3001	11.85	9.82
02ZP	n/a	n/a
0208	7.76	6.19
0202	7.79	5.83
0207	7.66	6.15
0201	7.66	5.69
031B	n/a	n/a
031A	n/a	n/a
131A	n/a	n/a
0303	7.2	5.91
0307	7.22	4.17
0304	7.24	5.92
0403	6.38	5.47
0404	6.39	5.55
0405	6.38	3.24
141A	n/a	n/a
241A	n/a	n/a
241B	n/a	n/a
1401	6.26	5.49
041C	n/a	n/a
041D	n/a	n/a
241C	n/a	n/a
2401	n/a	n/a
1403	6.31	2.91
241D	n/a	n/a
02YV	n/a	n/a
02XZ	n/a	n/a
02XR	n/a	n/a
02XT	n/a	n/a
0203	8.18	5.95
0209	8.26	6.37
021A	n/a	n/a
1101	8.76	6.55
1102	9.11	7.17
121B	n/a	n/a
1106	8.73	7.22
1104	8.73	6.63
121C	n/a	n/a
1105	8.62	6.83
1103	8.56	6.79
121A	n/a	n/a
1202	8.36	7.05
1201	8.34	7.04
2201	8.44	7.17
2102	8.57	8.27
31ME	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
31ML	n/a	n/a
321C	n/a	n/a
3103	10.43	9.23
3104	10.51	9.24
321B	n/a	n/a
3101	10.44	8.69
321A	n/a	n/a
3102	10.37	8.09
3201	n/a	n/a
01ZY	n/a	n/a
00ZY	n/a	n/a
00ZP	n/a	n/a
00ZW	n/a	n/a
00ZT	n/a	n/a
0014	12.07	7.86
0001	10.68	7.2
0006	12.05	7.89
0013	11.91	10.16
0011	10.6	9.25
0012	11.76	10.1
0015	12.04	10.61
00YV	n/a	n/a
01YV	n/a	n/a
00YQ	n/a	n/a
00XQ	n/a	n/a
01YW	n/a	n/a
001B	n/a	n/a
001A	n/a	n/a
00XZ	n/a	n/a
0016	12.07	10.52
00XP	n/a	n/a
00XW	n/a	n/a
03YP	n/a	n/a
02ZT	n/a	n/a
02YW	n/a	n/a
02YR	n/a	n/a
02XW	n/a	n/a
03YX	n/a	n/a
03YR	n/a	n/a
02YS	n/a	n/a
02YY	n/a	n/a
03YV	n/a	n/a
03ZV	n/a	n/a
03ZW	n/a	n/a
0101	9.3	5.94
0102	9.21	7
0104	9.96	7.26
02XQ	n/a	n/a
0103	9.22	7.57
011B	n/a	n/a
041G	n/a	n/a
041F	n/a	n/a
041E	n/a	n/a
4301	7.06	5.48
4302	7.28	5.86
4401	6.77	5.15
4403	6.79	5.75
441B	n/a	n/a
3407	6.95	5.81
3406	6.82	5.68
3401	6.84	5.01
4405	6.82	5.68
341A	n/a	n/a
441C	n/a	n/a
4402	6.76	4.83
4404	6.78	5.48
441A	n/a	n/a
4406	n/a	n/a
03ZY	n/a	n/a
041A	n/a	n/a
041B	n/a	n/a
04ZT	n/a	n/a
04ZV	n/a	n/a
04ZW	n/a	n/a
04ZY	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.

Asset Location Search Sewer Map - ALS/ALS Standard/2018_3818642

TQ1875NE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 518750,175750

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.

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
881C	n/a	n/a
881A	n/a	n/a
8801	6.71	5.05
8806	6.66	5.13
8807	6.57	4.89
981F	n/a	n/a
97ZX	n/a	n/a
9704	6.52	5.33
981B	n/a	n/a
9703	n/a	n/a
9709	n/a	n/a
97YX	n/a	n/a
97YV	n/a	n/a
981C	n/a	n/a
97YY	n/a	n/a
981A	n/a	n/a
981M	n/a	n/a
97YZ	n/a	n/a
9706	n/a	n/a
9705	n/a	n/a
9802	6.66	5.26
9501	6.02	4.95
9610	n/a	n/a
9607	6.03	4.81
96ZS	n/a	n/a
96ZW	n/a	n/a
96ZY	n/a	n/a
9608	8.22	3.2
96ZV	n/a	n/a
96ZT	n/a	n/a
96ZP	n/a	n/a
96ZQ	n/a	n/a
9609	10.29	2.77
9606	9.45	7.31
9601	n/a	-4.18
9605	9.74	9.04
9604	10.77	9.73
97XV	n/a	n/a
9701	6.03	5.37
97XW	n/a	n/a
97XT	n/a	n/a
9708	n/a	n/a
97XX	n/a	n/a
9707	n/a	n/a
97XZ	n/a	n/a
9702	n/a	n/a
85YP	n/a	n/a
8506	6.49	4.77
85XY	n/a	n/a
851B	n/a	n/a
851A	n/a	n/a
851D	n/a	n/a
851C	n/a	n/a
8507	6.41	4.81
8511	6.47	4.47
9506	n/a	n/a
9503	6.52	3.7
9504	6.09	5.1
0505	6.58	5.11
9502	6.58	5.12
8502	6.38	5.16
85ZX	n/a	n/a
85YY	n/a	n/a
85ZW	n/a	n/a
8504	6.44	5
8512	6.48	4.89
8513	6.54	4.66
851E	n/a	n/a
9505	n/a	n/a
651C	n/a	n/a
651E	n/a	n/a
6509	6.68	2.65
6504	6.65	4
7503	6.8	4.84
6902	6.59	5.3
7904	6.44	4.38
8901	6.88	5.89
88ZX	n/a	n/a
89ZX	n/a	n/a
891A	n/a	n/a
891B	n/a	n/a
981J	n/a	n/a
991E	n/a	n/a
9902	6.66	4.73
981G	n/a	n/a
9903	6.63	5.26
9801	6.97	5.52
9803	6.96	3.38
991D	n/a	n/a
991C	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
981K	n/a	n/a
771A	n/a	n/a
771B	n/a	n/a
671A	n/a	n/a
6701	5.91	4.81
6808	5.96	4.28
681A	n/a	n/a
781B	n/a	n/a
781A	n/a	n/a
781C	n/a	n/a
6809	5.74	4.04
6805	5.68	4.62
6807	5.99	4.39
6806	5.95	4.48
6804	n/a	n/a
6802	6.05	4.5
6810	5.94	3.04
6811	n/a	n/a
5802	6.32	2.84
6803	n/a	n/a
6801	6.5	4.52
681C	n/a	n/a
681B	n/a	n/a
6906	6.62	3.09
6901	6.58	4.75
6905	6.7	3.29
6903	6.64	5.26
6904	6.68	5.46
7706	6.24	5.04
7702A	6.26	3.95
771D	n/a	n/a
771C	n/a	n/a
7804	n/a	n/a
7801	6.29	4.59
8802	6.57	4.98
7803	6.23	3.39
8805	6.65	5.46
8804	6.73	5.46
78XX	n/a	n/a
881B	n/a	n/a
8803	6.75	5.2
78YS	n/a	n/a
78YR	n/a	n/a
78YX	n/a	n/a
7805	7.02	4.42
7903	7.02	4.78
79WX	n/a	n/a
79WW	n/a	n/a
79WZ	n/a	n/a
79XV	n/a	n/a
79XT	n/a	n/a
79XZ	n/a	n/a
79YV	n/a	n/a
79YT	n/a	n/a
8902	6.7	3.77
7905	6.65	3.96
7902	6.65	4.95
7901	6.44	5.01
57TX	n/a	n/a
57VQ	n/a	n/a
57TY	n/a	n/a
57TT	n/a	n/a
57VR	n/a	n/a
57TW	n/a	n/a
57VZ	n/a	n/a
57WS	n/a	n/a
57TZ	n/a	n/a
57VP	n/a	n/a
57VT	n/a	n/a
57VX	n/a	n/a
57WY	n/a	n/a
57XR	n/a	n/a
5701	6.35	4.54
5704	6.33	2.65
57WW	n/a	n/a
57WQ	n/a	n/a
57VW	n/a	n/a
5702	6.44	5.09
571B	n/a	n/a
57WV	n/a	n/a
57XP	n/a	n/a
571C	n/a	n/a
571A	n/a	n/a
5703	6.52	5.06
5801	6.27	4.34
76RX	n/a	n/a
77WQ	n/a	n/a
6707	6.59	4.96
77WR	n/a	n/a
77VZ	n/a	n/a
6703	6.61	4.68
6709	6.58	4.59
67WZ	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
67XS	n/a	n/a
67WS	n/a	n/a
67XV	n/a	n/a
67XQ	n/a	n/a
67YX	n/a	n/a
77XQ	n/a	n/a
77WX	n/a	n/a
67YV	n/a	n/a
77XR	n/a	n/a
77WY	n/a	n/a
57XZ	n/a	n/a
6704	6.5	4.82
57XX	n/a	n/a
57YP	n/a	n/a
6705	6.51	4.59
6702	6.31	5.16
67ZP	n/a	n/a
671C	n/a	n/a
671B	n/a	n/a
66SV	n/a	n/a
66XR	n/a	n/a
66ZT	n/a	n/a
66SQ	n/a	n/a
66ZW	n/a	n/a
66XP	n/a	n/a
76ZS	n/a	n/a
76VT	n/a	n/a
761A	n/a	n/a
76TS	n/a	n/a
76SV	n/a	n/a
76SP	n/a	n/a
76VP	n/a	n/a
76TX	n/a	n/a
76TZ	n/a	n/a
76VQ	n/a	n/a
76VS	n/a	n/a
76YP	n/a	n/a
76TP	n/a	n/a
76ZY	n/a	n/a
76YZ	n/a	n/a
76ZT	n/a	n/a
76YW	n/a	n/a
76ZW	n/a	n/a
76XW	n/a	n/a
76ZV	n/a	n/a
76YX	n/a	n/a
56VR	n/a	n/a
56YZ	n/a	n/a
56ZQ	n/a	n/a
56WX	n/a	n/a
56YX	n/a	n/a
56WW	n/a	n/a
56WV	n/a	n/a
5603	6.81	4.16
561A	n/a	n/a
561B	n/a	n/a
5602	6.81	3.96
5601	6.83	5.2
5604	n/a	n/a
561D	n/a	n/a
56YV	n/a	n/a
56YW	n/a	n/a
56YT	n/a	n/a
56ZV	n/a	n/a
56ZT	n/a	n/a
561C	n/a	n/a
56ZY	n/a	n/a
56YQ	n/a	n/a
56ZS	n/a	n/a
56YR	n/a	n/a
56ZX	n/a	n/a
66RR	n/a	n/a
66VX	n/a	n/a
66WQ	n/a	n/a
66ZY	n/a	n/a
66VZ	n/a	n/a
6601	6.8	4.94
6606	6.76	3.66
66VW	n/a	n/a
66VQ	n/a	n/a
66YY	n/a	n/a
66YZ	n/a	n/a
66YP	n/a	n/a
66SZ	n/a	n/a
66TQ	n/a	n/a
6602	6.64	5.1
66ZQ	n/a	n/a
6502	6.82	4.58
6604	6.83	3.32
66YS	n/a	n/a
66SX	n/a	n/a
66SS	n/a	n/a
66XQ	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
66YQ	n/a	n/a
66XV	n/a	n/a
66RX	n/a	n/a
66XS	n/a	n/a
66RW	n/a	n/a
66ZX	n/a	n/a
661A	n/a	n/a
851F	n/a	n/a
8615	6.54	4.48
8613	6.67	3.16
8601	n/a	-4.02
861D	n/a	n/a
86XZ	n/a	n/a
8611	n/a	n/a
8610	n/a	n/a
8603	6.42	5.36
8609	6.63	4.37
86ZS	n/a	n/a
86ZT	n/a	n/a
86ZV	n/a	n/a
8605	6.36	4.61
8604	6.02	4.27
86ZP	n/a	n/a
86ZY	n/a	n/a
861C	n/a	n/a
861A	n/a	n/a
8607	6.21	4.96
861B	n/a	n/a
871A	n/a	n/a
8703	6.04	3.96
8702	n/a	n/a
8701	6.07	4.32
87ZW	n/a	n/a
87ZS	n/a	n/a
87ZV	n/a	n/a
87ZT	n/a	n/a
87ZQ	n/a	n/a
76YS	n/a	n/a
76WP	n/a	n/a
76ZR	n/a	n/a
7701B	6.31	4.98
76XQ	n/a	n/a
76WS	n/a	n/a
76WY	n/a	n/a
76WW	n/a	n/a
76XP	n/a	n/a
7703	6.29	3.88
76WT	n/a	n/a
76WZ	n/a	n/a
77YR	n/a	n/a
77YV	n/a	n/a
75ZV	n/a	n/a
77YY	n/a	n/a
77ZQ	n/a	n/a
7704	6.37	3.77
77YS	n/a	n/a
77YW	n/a	n/a
77ZT	n/a	n/a
77ZX	n/a	n/a
77ZR	n/a	n/a
77ZY	n/a	n/a
8606	6.3	4.87
8608	6.3	3.61
8602	6.68	5.27
7518	6.69	4.41
7505	6.74	4.06
7504	6.58	5.06
7516	6.82	2.8
6508	6.78	2.84
75XW	n/a	n/a
65YQ	n/a	n/a
65XX	n/a	n/a
7506	6.9	4.01
651B	n/a	n/a
7507	6.83	4.05
7515	6.77	2.93
65XZ	n/a	n/a
7508	6.76	4.08
65XT	n/a	n/a
651A	n/a	n/a
65VW	n/a	n/a
7513	6.82	4.33
7510	6.69	5.08
751A	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.

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: 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
- Storm Relief
- Trunk Combined
- Vent Pipe
- Bio-solids (Sludge)
- Proposed Thames Surface Water Sewer
- Proposed Thames Water Foul Sewer
- Gallery
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Sludge Rising Main
- Proposed Thames Water Rising Main
- Vacuum

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

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

Areas

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
- Gulley
- Culverted Watercourse
- Proposed
- Abandoned Sewer

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.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. 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.

Asset Location Search Water Map - ALS/ALS Standard/2018_3818642

TQ1875SE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 518750,175250

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.

Asset Location Search Water Map - ALS/ALS Standard/2018_3818642

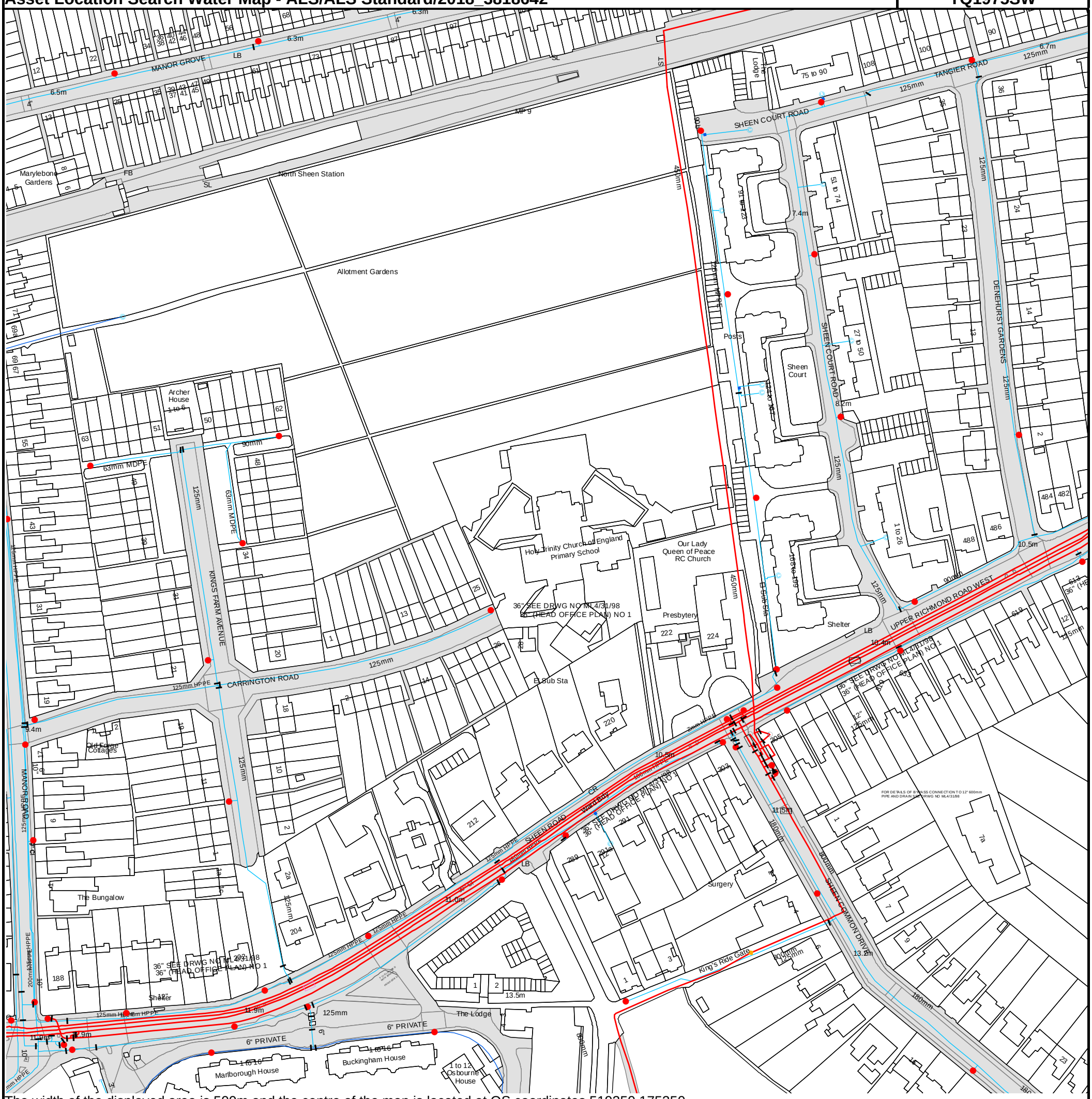
TQ1975NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 519250,175750

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.

Asset Location Search Water Map - ALS/ALS Standard/2018_3818642

TQ1975SW

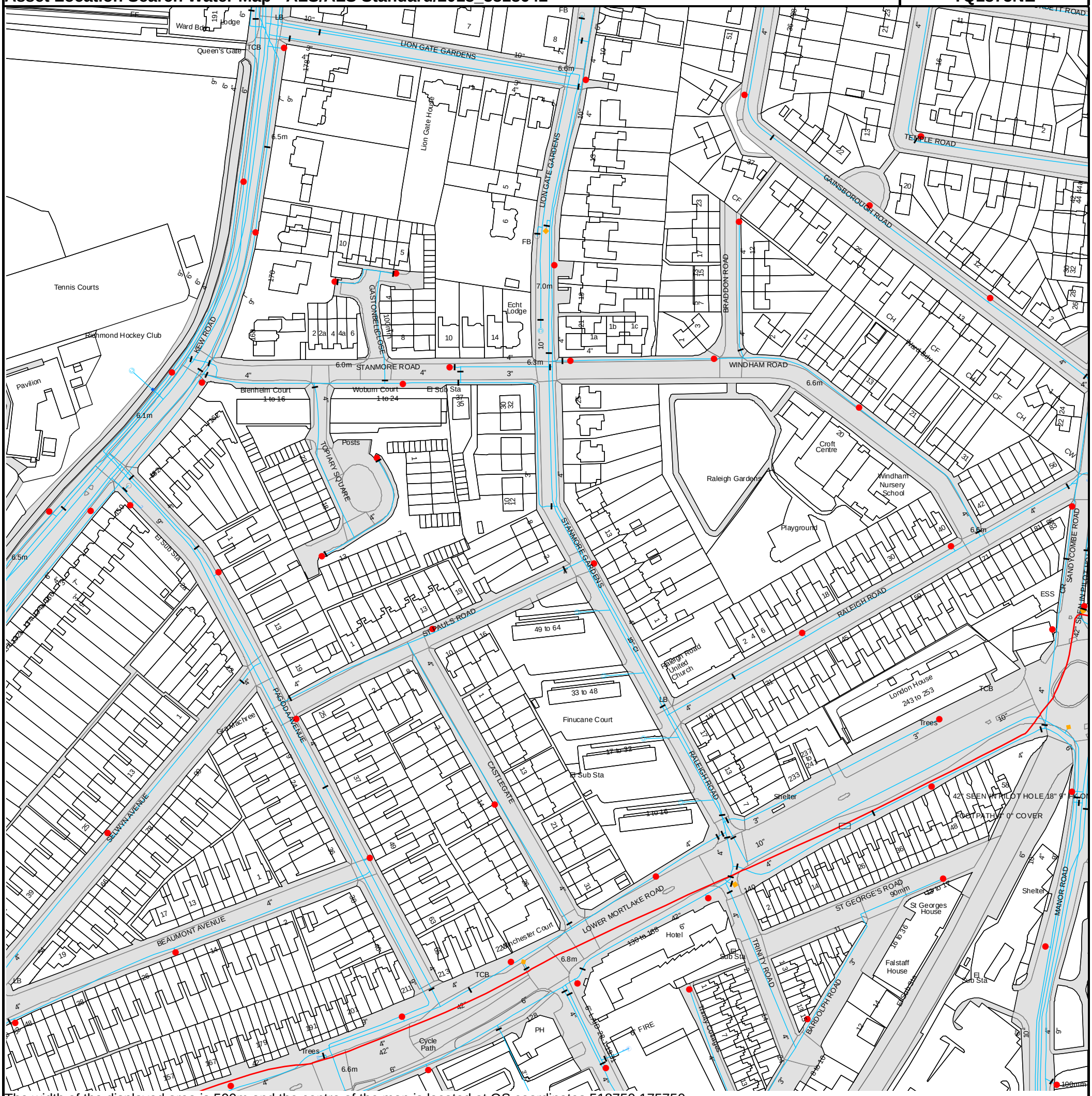


The width of the displayed area is 500m and the centre of the map is located at OS coordinates 519250,175250

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.

Asset Location Search Water Map - ALS/ALS Standard/2018_3818642

TQ1875NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 518750,175750

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.

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.

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

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')

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

Terms and Conditions

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

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

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

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

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

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

Ways to pay your bill

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

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

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

Sewer Flooding
History Enquiry

Property Searches

Fairhurst GGA

Search address supplied	Manor Road Richmond TW9 1YB
Your reference	126782
Our reference	SFH/SFH Standard/2018_3821103
Received date	**22 June 2018**
Search date	**25 June 2018**

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

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

Sewer Flooding
History Enquiry

Property Searches

Search address supplied: Manor Road,Richmond,TW9 1YB

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

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

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

Sewer Flooding
History Enquiry

Thames Water Property Searches

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk

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

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

126782

Pre-planning enquiry

Application form

Please complete this form and return it to us at
developer.services@thameswater.co.uk or
Thames Water, Developer Services, Clearwater Court,
Vastern Road, Reading, RG1 8DB.

Thames Water

Application for a pre-planning enquiry

Please complete all sections of this form in BLOCK CAPITALS

If you're using this form to request a budget estimate, please note that you should be able to calculate the likely charges involved in your scheme by consulting our guide, 'Charging arrangements for new connection services', on our website.

Are you a: Developer (Consultant) Land promoter (Please tick one.)

Is your application for: Water (Wastewater) Both (Please tick one.)

Would you like a water budget estimate? Yes (No)

(We can only offer a wastewater budget estimate after modelling, if required).

A - About the person applying

Company name FAIRHURST

Title (Mr) Mrs Ms Miss Dr Other

First name(s) ADAM

Last name PRAS

Preferred contact number 0207 828 8205

Alternative number —

Email address ADAM.PRAS@FAIRHURST.CO.UK

Full postal address

Address line 1 135 PARK ST

Address line 2

Town LONDON

County

Postcode SE1 9EA

B - Nominated contact

Who should we contact to process your application? (Applicant) Someone else

(Please tick one.)

If someone else:

Company name

Title Mr Mrs Ms Miss Dr Other

First name(s)

Last name

Preferred contact number

Alternative number

Email address

Full postal address Address line 1

Address line 2

Town

County Postcode

C - Where the work is taking place

What is the address of the property being connected? Same as applicant / Somewhere else (circled) / Same as nominated contact (Please tick one.)

If somewhere else: HOMEBASE, MANOR ROAD

Site name

Full postal address Address line 1 HOMEBASE

Address line 2 MANOR ROAD

Town RICHMOND

County Postcode TW9 1YB

D - About the site

What is the local authority? RICHMOND UPON THAMES

Ordnance Survey grid ref 518901, 175426

Type of site Greenfield / Brownfield (circled) / Mixed

How big is the site? 1.65 hectares

When do you intend to have first occupancy? 12 2019 (Approximate date if necessary)

E - Planning status (if you've already started the planning process)

Is the development identified in the local plan? Yes / No (circled) / Don't know — If Yes, reference number

Does it have outline planning permission? Yes / No (circled) / Don't know — If Yes, reference number

Does it have full planning permission? Yes / No (circled) / Don't know — If Yes, reference number

Does the development have building regulations permission? Yes / No (circled) / Don't know

When do you intend to start on site? 04 2019 (MM YYYY)

F - About the water supply

If you're proposing a water storage tank, what is its capacity? m^3

When will you want your first domestic connection laid on? MM YYYY N/A

For water supplies, what is the estimated flow rate required for your site? litres/sec (Not required if applying only for wastewater.)

G - Existing sewerage connections (Not required if applying only for water.)

	Foul water	Surface water
Does the site have the following sewerage connections?	Yes	no
What is the type of discharge method?	Gravity (circled)	Gravity
	Pumped	Pumped
If sewage is pumped, what is the pump rate?	litres/sec	litres/sec
Amount of existing impermeable area per connection	N/A	
What are the existing connection points? (For example, 'X' number of domestic and commercial properties drain into manhole 'Y' / sewer with diameter of 'Z'.)	U/S MH 9401 VIA MANHOLE (CONNECTION MH NOT ON THAMES WATER RECORDS)	

H - Proposed sewerage connections (Not required if applying only for water.)

	Foul water	Surface water
Does the site have the following sewerage connections?	Yes	Yes
What is the type of discharge method?	Gravity (circled)	Gravity
	Pumped	Pumped
If sewage is pumped, what is the pump rate?	litres/sec	litres/sec
What is your proposed approach to surface water drainage?	N/A	✓ Traditional piped system
		Sustainable drainage system (SuDS)
Do you propose using separate highway and surface water drainage systems?	N/A	Yes ✓ No
If the surface water rate is attenuated, to what rate is it attenuated?	N/A	25.2 litres/sec
Amount of proposed impermeable area per connection	N/A	[redacted] 1.65ha
What are the proposed connection points? (For example, 'X' number of domestic and commercial properties drain into manhole 'Y' / sewer with diameter of 'Z'.)	REUSE EXISTING	CLOSE TO MH 9407

Please note: The developer is expected to follow the local authority's drainage strategy and be able to demonstrate how the proposed (attenuated) discharge rate of any surface water flows has been calculated. For developments in Greater London, please refer to the London Plan Drainage Hierarchy (Policy 5.13). We will challenge the rates provided if they are not in line with those based on the local drainage strategies.

I - Additional information (where available)

When we're assessing your development needs, it's important that we know what buildings (if any) currently exist on the site. It may be, for example, that the infrastructure serving those properties is already sufficient to cater for your proposed development.

We realise it may be too early in your process to complete this table, but any information you can provide at this stage will help improve the accuracy of our assessment and could prevent us from requesting data in the future.

Property type	Existing site	Proposed site
General housing (units 3 person+)		233
Flat (units up to 2 person)		151
Primary school (max. pupil capacity)		
Senior school (max. pupil capacity)		
Boarding school (max. pupil capacity)		
Assembly hall (max. capacity)		
Cinema (max. capacity)		
Theatre (max. capacity)		
Sports hall (max. capacity)		
Hotel (total bedrooms)		
Guest house (total bedrooms)		
Motel (total bedrooms)		
Holiday apartment (capacity)		
Leisure park (capacity)		
Caravan park standard (per space)		
Caravan site standard (per space)		
Camping site standard (per space)		
Camping site serviced (per space)		
Public house (max. capacity)		
Restaurant / Day care centre (max. capacity)		
Drive in restaurant (max. capacity)		
Hospital (per bed)		
Nursing / Care home (per bed)		
Offices (gross internal area in m^2)		
Shopping centre (gross internal area in m^2)	3,522	
Warehouse (gross internal area in m^2)		
Commercial premises (gross internal area in m^2)		475
Manufacturing unit (gross internal area in m^2)		
Other (please state units and description)		

J - Enclose your documents

Please make sure any attachments are in PDF format and don't exceed a total of 20MB in size per email.

All drawings must be of suitable detail and have a drawing reference number on them.

What we need from you to process your application:

Site location plan	This should show the site with nearby buildings, roads and any sewers.
Scaled site layout	This should show existing and proposed layouts.
Site drainage strategy plan (if available at this stage)	This should show all proposed sewers, pipe sizes and gradients. (Not required if applying only for water.)

Please also let us know if you have a **schedule of planned works** showing how you might phase your development.

Please note, without this information we may need to make assumptions about your requirements when calculating your budget estimate (if requested).

K - How we'll use this information

We'll use the information you give on this application form, and potentially share it with our delivery partners, to provide the service you've requested.

This could include contacting you to discuss your application and/or provide more details, visiting the site where work needs to be carried out, and invoicing you when appropriate. Your feedback is important to us, so we may also use the information to ask for your feedback on how we can improve our performance.

We won't use this information for marketing purposes without contacting you to seek your consent.

You can find Thames Water's privacy policy at thameswater.co.uk/Legal/Privacy.

L - Declaration

I confirm to the best of my knowledge that the information in this application is complete and correct.

Print name ADAM ORAS

Position within company CIVIL ENGINEER

Company FAIRHURST

Date 14/12/2018

Signature

Submitting your application

Please email your completed form to developer.services@thameswater.co.uk or send it to Thames Water Developer Services, Clearwater Court, Vastern Road, Reading RG1 8DB.

Once we've assessed your application, we'll write to tell you the result within 21 calendar days.

Where we know there's sufficient capacity we'll tell you, but if we're concerned there may not be, we'll advise you of the next steps. We'll also let you know if we need further information from you.

Getting in touch

For enquiries regarding this application or any other questions relating to your building or development work please contact us on:

thameswater.co.uk/developerservices

developer.services@thameswater.co.uk

0800 009 3921
Monday – Friday, 8am – 5pm

Thames Water, Developer Services, Clearwater Court,
Vastern Road, Reading, Berkshire RG1 8DB

This leaflet can be supplied in braille or audio-tape upon request.

Thames Water

Adam Prais

From: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 04 January 2019 09:46
To: Adam Prais
Cc: siva.rajaratnam@thameswater.co.uk
Subject: RE: RE: RE: RE: DS6056467 - TW9 1YB Manor Road, Richmond

Dear Adam

Further to your previous communication with Siva, please see the feedback from our Asset Planning Team below:

Thames Water have noted that there is not yet a defined surface water drainage strategy for this site, for this reason we have been unable to identify the potential impact that this development proposes. We would request evidence of the existing surface water disposal method for the site, from this we can establish how the proposed strategy affects the public network. We would recommend that the surface water drainage strategy for this development should follow policy 5.13 of the London Plan. Typically greenfield run off rates of 5l/s/ha should be aimed for using the drainage hierarchy. The hierarchy lists the preference for surface water disposal as follows; Store Rainwater for later use > Use infiltration techniques, such as porous surfaces in non-clay areas > Attenuate rainwater in ponds or open water features for gradual release > Discharge rainwater direct to a watercourse > Discharge rainwater direct to a surface water sewer/drain > Discharge rainwater to the combined sewer.

With regards to the foul water proposals for this site we would request more details on how the split of flows relates to residential dwellings and commercial metereage per connection point. We request this in order to be able to assess the potential impact upon the public network. The proposal to connect 100% of the foul water flows from this site to Manhole TQ18759401 is acceptable and can be accommodated.

Should you have any further queries, please do not hesitate to contact me again.

Kind Regards

Artur Jaroma
Developer Services – Sewer Adoptions Engineer
Office: 0203 577 8082
artur.jaroma@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk

Original Text

From: "DEVELOPER.SERVICES@THAMESWATER.CO.U" <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
To: adam.prais@fairhurst.co.uk
CC: siva.rajaratnam@thameswater.co.uk <siva.rajaratnam@thameswater.co.uk>
Sent: 21.12.18 16:15:00
Subject: RE: RE: RE: DS6056467 - TW9 1YB Manor Road, Richmond

Dear Adam,

I have consulted with our Asset Planners to confirm whether capacity exists for the foul water and as soon as I have a response I will update you.

Due to the festive period this will be in the New Year.

In regards to the surface water I have stated this will be discharged to a soakaway. If infiltration is not possible we would consider a restricted discharge of 5 litres per second per hectare or limited to the equivalent Greenfield run-off rate. This would need to be discussed with the Lead Local Flood Authority whose responsibility it is to manage risk from surface water flooding.

Regards

Siva Rajaratnam

Developer Services – Adoptions Engineer

Mobile 07747 640477 Landline 0203 577 9811

siva.rajaratnam@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk

Original Text

From: Adam Prais <adam.prais@fairhurst.co.uk>
To: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
CC: siva.rajaratnam@thameswater.co.uk <siva.rajaratnam@thameswater.co.uk>
Sent: 20.12.18 12:23:08
Subject: RE: RE: DS6056467 - TW9 1YB Manor Road, Richmond

Dear Siva,

Thank you for your comments. We do not currently have possession of the site to complete the tests so are planning alternatives to understand the cost and project implications if infiltration is not possible.

To assist this, would it be possible for you to provide an advisory rate of what capacity is available / allowable if required. We can then prepare contingency plans. Following receipt of infiltration tests, we would consult with you again with the additional information for a formal response, but if you could provide an indicative rate, it would be much appreciated.

Are you able to progress the foul water checks separately in the meantime too?

Kind regards,

Adam

Adam Prais
Civil Engineer

FAIRHURST
engineering solutions, delivering results

135 Park Street
London, SE1 9EA
Tel: 020 7828 8205

Website: www.fairhurst.co.uk @fairhurstlondon

Why not take a look at our Practice Profile to see the diverse range of skills we can offer. Just click <HERE>

Consider the environment. Please don't print this e-mail unless you really need to.

From: DEVELOPER.SERVICES@THAMESWATER.CO.U [mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK]
Sent: 20 December 2018 12:16
To: Adam Prais
Cc: siva.rajaratnam@thameswater.co.uk
Subject: RE: RE: DS6056467 - TW9 1YB Manor Road, Richmond

Dear Adam,

Thank you for the additional information. Once you have the results from the infiltration tests I will be able to complete the capacity assessment.

If infiltration is not possible I will require a surface water drainage strategy to show how the flows will be attenuated. The proposed flow rate is currently too high and we would require this to be reduced further.

Regards

Siva Rajaratnam

Developer Services – Adoptions Engineer

Mobile 07747 640477 Landline 0203 577 9811

siva.rajaratnam@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk

Original Text

From: Adam Prais <adam.prais@fairhurst.co.uk>
To: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
CC: siva.rajaratnam@thameswater.co.uk <siva.rajaratnam@thameswater.co.uk>
Sent: 20.12.18 09:40:06
Subject: RE: DS6056467 - TW9 1YB Manor Road, Richmond

Dear Siva,

Thank you for your email. Please see attached the draft FRA which answers most of your questions. I have also summarised the responses below;

1. <![if !supportLists]><![endif]><![if !supportLists]><![endif]>Surface water is currently discharging to soakaways however the proposed development requires the removal of these. We are investigating the infiltration rates of the ground however preliminary desk studies indicate this may not be feasible due to ground water levels. We are investigating options for in case infiltration is not possible.
2. <![if !supportLists]><![endif]><![if !supportLists]><![endif]>Discharge via gravity
3. <![if !supportLists]><![endif]><![if !supportLists]><![endif]>(1) Infiltration – under investigation, see FRA (2) Watercourse – non on site, not possible (3) Sewer – required if infiltration not feasible
4. <![if !supportLists]><![endif]><![if !supportLists]><![endif]>Please see table for runoff rates. The site is currently 100% impermeable. The proposed development will include some soft landscaping however the extent of this is to be confirmed. As such the current design is based on the site remaining 100% impermeable and the proposed brownfield rates will therefore be the same. In line with your comments below and local requirements, we would limit the site to the equivalent greenfield rate including climate change allowances.

	Existing		Proposed
Return Period	Greenfield Rates	Brownfield Rates	Brownfield Rates
	Runoff (site) (l/s)	Runoff (site) (l/s)	Runoff (site) (l/s)
1yr	6.7	252.5	
30yr	18.2	594.7	
100yr	25.2	753.6	
100yr + climate change			25.2

Kind regards,

Adam

Adam Prais
Civil Engineer

FAIRHURST
engineering solutions, delivering results

135 Park Street
London, SE1 9EA
Tel: 020 7828 8205

Website: www.fairhurst.co.uk @fairhurstlondon

From: DEVELOPER.SERVICES@THAMESWATER.CO.U [mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK]
Sent: 19 December 2018 15:09
To: Adam Prais
Cc: siva.rajaratnam@thameswater.co.uk
Subject: DS6056467 - TW9 1YB Manor Road, Richmond

Dear Adam,

Thank you for your Pre-Planning application. In order for me to process this further can you confirm the following details to complete the capacity assessment;

1 – How is the surface water currently discharged from the site?

2 – What is the proposed surface discharge method (gravity or pumped)?

3 - Have all surface water disposal routes been explored and has the London Plan Drainage Hierarchy (Policy 5.13) been followed. Only when it has been proven that infiltration to the ground or a connection into a watercourse is not possible would we consider a restricted discharge into the public surface water sewer network of **5 litres per second per hectare** or limited to the equivalent Greenfield run-off rate.

4- The surface water run-off rates for the existing and proposed site for the range of storms (1:1, 1:10, 1:30 and 1:100).

Should you have any queries please feel free to contact me on 0203 577 9811.

Regards

Siva Rajaratnam

Developer Services – Adoptions Engineer

Mobile 07747 640477 Landline 0203 577 9811

siva.rajaratnam@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk

Original Text

From: Adam Prais <adam.prais@fairhurst.co.uk>

To: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>

CC:

Sent: 14.12.18 15:06:19

Subject: 126782 - Manor Road, Richmond

Dear Sir or Madam,

Please find attached a preplanning enquiry and supporting documents for a proposed development at Manor Road, Richmond. The site is currently preplanning stage and we are writing to you at this time to confirm capacity in the network alongside the development of our drainage strategy.

Kind regards,

Adam

Adam Prais
Civil Engineer

FAIRHURST
engineering solutions, delivering results

135 Park Street
London, SE1 9EA
Tel: 020 7828 8205

Website: www.fairhurst.co.uk @fairhurstlondon

Why not take a look at our Practice Profile to see the diverse range of skills we can offer. Just click <HERE>

Consider the environment. Please don't print this e-mail unless you really need to.

Festive Wishes from Fairhurst – Our policy is to donate to charity rather than to send cards and our chosen charities this year are SensationALL, British Heart Foundation and the Breast Cancer Research Foundation.

SensationALL are a small charity based in Westhill, Aberdeenshire for children and adults with additional support needs.

Festive Wishes from Fairhurst – Our policy is to donate to charity rather than to send cards and our chosen charities this year are SensationALL, British Heart Foundation and the Breast Cancer Research Foundation.

SensationALL are a small charity based in Westhill, Aberdeenshire for children and adults with additional support needs.

This email has been scanned by the Symantec Email Security.cloud service.
For more information please visit http://www.symanteccloud.com

Festive Wishes from Fairhurst – Our policy is to donate to charity rather than to send cards and our chosen charities this year are SensationALL, British Heart Foundation and the Breast Cancer Research Foundation.

SensationALL are a small charity based in Westhill, Aberdeenshire for children and adults with additional support needs.

This email message and accompanying data are for the sole use of the intended recipient(s) and may contain confidential information and/or copyright material. Unauthorised use, copying or disclosure of any of it is prohibited and may be unlawful. If you received this email message in error, please notify us immediately and erase all copies of this message and attachments.

Where this e-mail is unrelated to the business of Fairhurst, the opinions expressed within this e-mail are the opinions of the sender and do not necessarily constitute those of Fairhurst.

Fairhurst scans and monitors incoming and outgoing mail in accordance with its Email Policy. This email has been scanned for viruses but Fairhurst accept no liability for any virus which may be attached.

A full list of partners is available for inspection at any of the firm's offices.

Mr Adam Prais
Fairhurst
135 Park Street
London
SE1 9EA

Wastewater pre-planning
Our ref DS6056467

11 Jan. 19

Pre-planning enquiry: Confirmation of sufficient capacity

Dear Mr Prais

Thank you for providing information on your development **at Homebase, Manor Road, Richmond, TW9 1YB.**

Construction of 384 residential units and 475m2 of commercial premises. Foul water discharging by gravity into existing connection at MH9401.

Foul Water

From the information you have provided, we can confirm that the existing foul sewer network does have sufficient capacity to accommodate the proposed foul water discharge from the proposed development.

Surface Water

Please note that discharging surface water to the public sewer network should only be considered after all other methods of disposal have been investigated and proven to not be viable. In accordance with the Building Act 2000 Clause H3.3, positive connection to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. The disposal hierarchy being: 1st Soakaways; 2nd Watercourses; 3rd Sewers.

Only when it can be proven that soakage into the ground or a connection into the adjacent watercourse is not possible would we consider a restricted discharge into the public surface water sewer network.

We would encourage techniques such as green roofs and/or permeable paving that restricts surface water discharge from your site.

When redeveloping an existing site, policy 5.13 of the London Plan and Policy 3.4 of the Supplementary Planning Guidance (Sustainable Design And Construction) states that every attempt should be made to use flow attenuation and SUDS/storage to reduce the surface water discharge from the site as much as possible.

If they are consulted as part of any planning application, Thames Water Planning team would ask to see why it is not practicable to attenuate the flows to Greenfield run-off rates i.e.

5l/s/hectare of the total site area or if the site is less than hectare in size then the flows should be reduced by 95% of existing flows. Should the policy above be followed, we would envisage no capacity concerns with regards to surface water for this site.

Please note that the Local Planning authority may comment on surface water discharge under the planning process.

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/s.

If you've any further questions, please contact me on 0203 577 8082.

Yours sincerely

Artur Jaroma

Thames Water

A.4 Development Proposal Plans

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-			
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

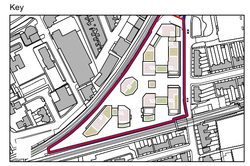
Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key



Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Basement

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 199

Status & Revision

P11

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-	-	-	
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key

Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Ground Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 200

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-	-		
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

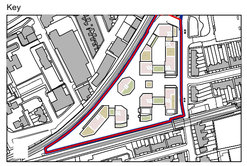
Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key



Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
First Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 201

Status & Revision

P11

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-			
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key

Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Second Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 202

Status & Revision

P11

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-	-		
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key

Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Third Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 203

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-			
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

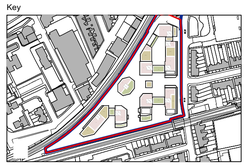
Purpose of information

The purpose of the information on this drawing is for:

Planning	☐
Information	☒
Comment	☐
Client approval	☐
Construction	☐

All information on this drawing is not for construction unless it is marked for construction.

Key



Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Fourth Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 204

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-			
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key

Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Fifth Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 205

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-			
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key

Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Sixth Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 206

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-			
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key

Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Seventh Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 207

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-			
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

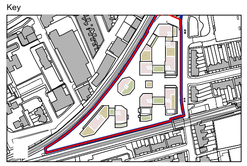
Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key



Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Eighth Floor

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 208

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

N

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

Enter Source Filename ' Eg AA Title Block'

Status R:	Revision	Date	DRN	CHK	CDM
2	For Information	7/6/18	HB	JL	
3	For Information	26/7/18	HB	JL	
4	For Information	8/8/18	HB	JL	
5	For Information	23/8/18	AS	JL	
6	Not Issued	-	-		
7	For Information	29/08/18	AS	HB	
8	For Information	26/9/18	AS	HB	
9	For Information	17/10/18	AS	HB	
10	For Information	19/10/18	AS	HB	
11	For Information	21/11/18	AS	HB	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Key

Client

Avanton

Project title

A3004
Manor Road Richmond

Drawing title

GA Plans
Roof Plan

Scale @ A1 size: **1:500**

Date: **Nov '18**

Drawing N°

A3004 210

Status & Revision

P12

Assael

Assael Architecture Limited
123 Upper Richmond Road
London SW15 2TL

+44 (0)20 7736 7744
info@assael.co.uk
www.assael.co.uk

A.5 Surface Water Calculations

- Greenfield runoff rates
- Predevelopment brownfield runoff rates
- MicroDrainage quick storage estimates (greenfield attenuation)
- MicroDrainage infiltration simulation results

FAIRHURST

Greenfield Runoff		Job No.	126782	Calculated	AP
		Date	14/12/2018	Checked	AP
Project	Manor Road, Richmond				

Site Information

Site Location	TW9 1YB	
Site Area	1.65	ha
Impermeable Area	1.65	ha
% Impermeable	100	%

Hydrological Region	6		
SOIL Type	4		
SAAR	696		
SPR	0.47		
$A_{(50)}$	50		Minum 50 hectares
$Q_{BAR(50)}$	239.78		50 hectare equivelent
Q_{BAR}	7.91	l/s	Qbar for site
$Q_{BAR(site)}/A_{(site)}$	4.80	l/s/ha	Qbar per hectare of site

GC_1	*0.85*	Growth curves for Hydrological Region
GC_{30}	*2.30*	
GC_{100}	*3.19*	

Total Q $_{1yr}$	**4.1**	l/s/ha
Total Q $_{30yr}$	**11.0**	l/s/ha
Total Q $_{100yr}$	**15.3**	l/s/ha

Total Q $_{1yr}$	**6.7**	l/s
Total Q $_{30yr}$	**18.2**	l/s
Total Q $_{100yr}$	**25.2**	l/s

FAIRHURST

Brownfield Runoff	Job No.	126782	Calculated	AP
	Date	14/12/2018	Checked	AP
Project	Manor Road, Richmond			

Site Location	TW9 1YB		**Site Information**
Site Area	1.65	ha	
Impermeable Area	1.65	ha	
% Impermeable	100	%	
Climate Change Allowance	35	%	

M5 -60	20	mm	**Storm Information**
Ratio 'r'	0.4		
Storm Duration	5	Minutes	
Z1	0.37		
M5-Dmin	7.4	mm	

Z2	0.62		**1 Year Runoff**
M1-Dmin	4.6	mm	
i	55.1	mm/hr	
Runoff	252.5	l/s	

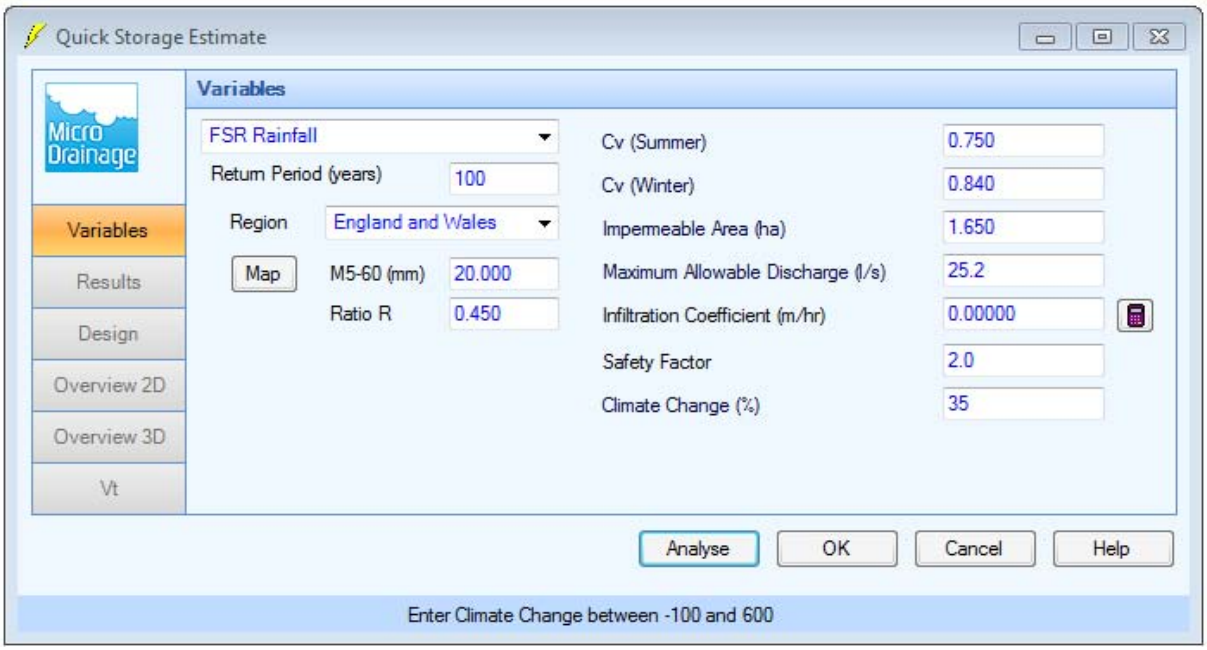
Z2	1.46		**30 Year Runoff**
M30-Dmin	10.8	mm	
i	129.6	mm/hr	
Runoff	594.7	l/s	

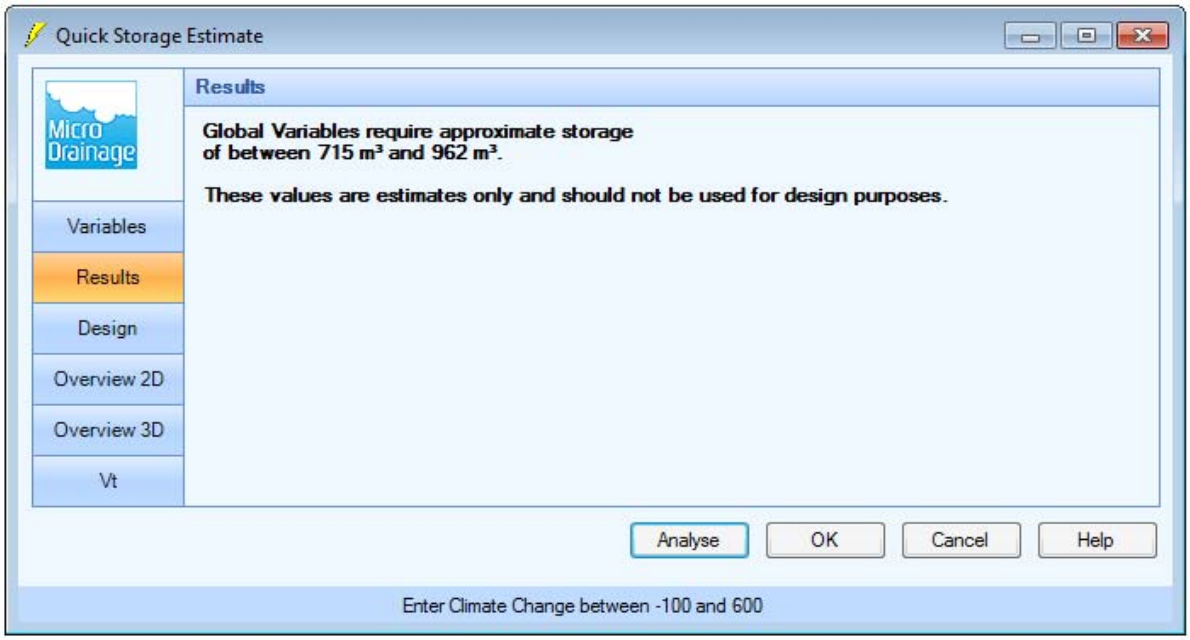
Z2	1.85		**100 Year Runoff**
M100-Dmin	13.7	mm	
i	164.28	mm/hr	
Runoff	753.6	l/s	

Z2	1.85		**100 Year + Climate Change Runoff**
M100-Dmin	13.7	mm	
i	221.8	mm/hr	
Runoff	1017.3	l/s	

FAIRHURST

Attenuation required for 100yr + 35% climate chage storm at greenfield runoff rates	Job No.	126782	Calculated	AP
	Date	14/12/2018	Checked	AP
Project	Manor Road, Richmond			





Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.001	-	-	100	0.650	0.650	0.650
1.002	-	-	100	1.000	1.000	1.000
				Total	Total	Total
				1.650	1.650	1.650

Storage Structures for Storm

Cellular Storage Manhole: Blue Roof, DS/PN: 1.001

Invert Level (m) 8.561 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	6500.0	0.0	0.151	0.0	0.0
0.150	6500.0	0.0			

Cellular Storage Manhole: Landscape & Infiltration, DS/PN: 1.002

Invert Level (m) 8.115 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.10000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.10000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	450.0	450.0	1.201	0.0	450.0
1.200	450.0	450.0			

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.450
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	35

PN	US/MH Name	Event	Flooded Volume (m³)	Overflow (l/s)
1.001	Blue Roof	1440 minute 100 year Winter I+35%	0.000	
1.002	Landscape & Infiltration	360 minute 100 year Winter I+35%	0.000	

PN	US/MH Name	Infil. Flow (l/s)	Infil. Vol (m³)	Maximum Vol (m³)	Pipe Flow (l/s)	Status
1.001	Blue Roof	0.0	0.000	665.438	5.0	OK
1.002	Landscape & Infiltration	6.3	259.394	519.908	0.0	SURCHARGED

A.6 Surface Water Drainage Strategy

- Fairhurst drawing 126782-C-4000

ASSUMPTIONS MADE

1. LOCAL BOREHOLES INDICATE SOIL TO BE SANDY GRAVEL WITH AN ASSUMED TYPICAL INFILTRATION RATE OF 0.1m/hr BASED ON EMPIRICAL EVIDENCE IN DESIGN GUIDES. TO BE CONFIRMED BY SITE TESTING
2. ALL BUILDINGS TO HAVE BLUE ROOFS LIMITED TO 1l/s/BUILDING
3. MIRCRODRAINAGE ESTIMATE FOR NON-ROOF AREAS (1.0ha) REQUIRES APPROXIMATELY 550m^3 IF 100% IMPERMEABLE (SUBJECT TO DETAILED DESIGN) FOR A TANK WITH 450m^2 BASE FOR INFILTRATION.
4. DEEPER TANKS WITH SMALLER BASE AREAS WILL INFILTRATE SLOWER AND THEREFORE MAY NEED TO BE LARGER.

PIPES TO RUN THROUGH BASEMENT AT HIGH LEVEL

INSUFFICIENT SPACE FOR INFILTRATION DUE TO NETWORK RAIL EXCLUSION ZONE

MINIMUM 10m EXCLUSION ZONE FROM NETWORK RAIL BOUNDARY SUBJECT TO NETWORK RAIL'S AGREEMENT

0m 5m 10m 20m 30m 40m 50m

PLOT SCALE = 1:500

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, INC. RISK ASSESSMENTS (SEE CDM NOTES) AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
3. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE STATED.
4. ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
5. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
6. ANY WORKS OUTSIDE SITE BOUNDARY ARE FOR INFORMATION PURPOSES ONLY. UNLESS SPECIFICALLY NOTED, ALL WORKS OUTSIDE THE SITE BOUNDARY WILL BE UNDERTAKEN BY OTHERS UNDER A SEPARATE CONTRACT.
7. THE CONTRACTOR SHALL UNDERTAKE SUCH MATERIALS TESTING AS INDICATED IN THE SPECIFICATIONS AND SHALL INCLUDE THE COST OF TESTING IN THE TENDER.
8. SITE AREA = 1.65ha

KEY

- SITE BOUNDARY
- 10m NETWORK RAIL EXCLUSION ZONE FOR INFILTRATION
- 5m HOUSING EXCLUSION ZONE FOR INFILTRATION
- INFILTRATION CRATE
- BLUE ROOFS TYPICALLY 85-150mm THICK
- EXISTING SW MANHOLE
- EXISTING SW PIPE
- IC PROPOSED SW MANHOLE
- PROPOSED SW PIPE
- RWP PROPOSED RAINWATER PIPE

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P03	14/12/18	SITE LAYOUT UPDATED	CD	AP	AC
P02	21/11/18	KEY AMENDED	CD	AP	AC
P01	20/11/18	ISSUED FOR INFORMATION	CD	AP	AC

FAIRHURST
135 Park Street
LONDON
SE1 9EA
Tel: 020 7828 8205
Fax: 084 4381 4412
Fairhurst.co.uk

Client: AVANTON

Project Title:

FORMER HOMEBASE MANOR ROAD RICHMOND

Drawing Title:

PRELIMINARY DRAINAGE STRATEGY

Scale at A1:	Status:	Fairhurst Project No:
1:500	DISCUSSION	126782
Drawn:	Checked:	Approved:
AP	AP	AC
Date:	Date:	Date:
NOV 18	NOV 18	NOV 18

Drawing No.: 126782-C-4000 Revision: P03

A.7 Typical Drainage Maintenance Schedules

Drainage Maintenance Schedules

DOCUMENT CONTROL		Name	Signature	Date
	Prepared by	A Prais		Nov 2018
	Checked by	A Prais		Nov 2018
	Approved by	A Chambers		Nov 2018

Rev.	Date	Status	Description	Signature		
1				By	Chk	Aprv
2				By	Chk	Aprv

FAIRHURST
consulting engineers

1 Overview

1.1.1 The following tables are taken from the SuDS Manual (CIRIA C753) where available or from manufacturers data and recommendations giving the operation and maintenance requirements for various surface water drainage components.

1.1.2 A brief description to be included in the maintenance strategy note / report is included.

1.1.3 This note is intended to be a live document and added to as different components are used at different sites and to be used as a resource for when producing schedules for future sites using the same / similar components.

1.2 Operation and Maintenance

1.2.1 There are three types of maintenance activities associated with surface water drainage systems. The SuDS Manual, CIRIA C753, defines these as:

- Regular Maintenance – 'basic tasks undertaken on a frequent and predictable schedule' including vegetation management, litter and debris removal, and inspections.'
- Occasional Maintenance – 'tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example.'
- Remedial Maintenance – 'intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.'

1.2.2 Specific maintenance needs should be monitored and maintenance schedules adjusted to suit the location and condition of the drainage feature in question.

1.2.3 The table below gives an overview of the maintenance required for each of the SuDS elements used on the site.

1.2.4 Not all drainage features which require maintenance are SuDS devices and are therefore not all in the table below. This includes the following;

- Flow controls including orifice plates, vortex controls etc

Details of the maintenance of these are given in later sections alongside the full details of the SuDS device maintenance requirements.

Operation & maintenance requirement	Piped Network / Inspection Chambers	Porous Pavement	Petrol Interceptor	Modular Storage Tank	Soakaway	Green Roof	Detention / infiltration Basin	Swale
Regular Maintenance								
Inspection	■	■	□	■	■	■	■	■
Litter and debris removal	■	■	□	□	□	■	■	■
Grass Cutting		□	□	□	□	■	■	■
Weed / invasive plant control		□				□	□	□
Shrub management		□				□	□	□
Shoreline vegetation management							□	
Aquatic vegetation management							□	
Occasional Maintenance								
Sediment management[1]	■	■	■	■	■	■	■	■
Vegetation/plant replacement						□	□	□
Vacuum sweeping and		■						

Operation & maintenance requirement	Piped Network / Inspection Chambers	Porous Pavement	Petrol Interceptor	Modular Storage Tank	Soakaway	Green Roof	Detention / infiltration Basin	Swale
brushing								
Remedial Maintenance								
Structure rehabilitation / repair	□		□		□	□	□	□
Infiltration surface reconditioning	□	□	□	□	□	□	□	□
■ Will be required □ May be required [1]Sediment should be collected and managed in pre-treatment systems, upstream of the main device.								

Table 1 - Extracted and adapted from The SuDS Manual (C697, 20071) Table 22.1: Typical key SuDS components operation and maintenance activities.

[1] CIRIA C697 SuDS Manual was superseded in 2015 by the updated SuDS Manual, C753. This table is still relevant however was not included in this format in the later edition.

2 Schedules

2.1 Attenuation Storage Tanks

Source: CIRIA C753 - Table 21.3

2.1.1 Attenuation tanks, in various forms, are used to store runoff on site to limit the peak discharge into the adopted surface water network. On this site, this storage has been achieved through the provision of a below ground cellular storage tank. This tank has a high void ratio allowing large volumes of surface waters to be stored during storm events which is discharged at a controlled flow rate into the sewer network.

2.1.2 Tanks require regular inspection to ensure they operate as designed and do not become blocked, preventing flows entering / exiting the tank or reducing their storage capacity.

2.1.3 During storm events, surface water may be attenuated for long periods of time in the tank. This time may result in any silts suspended in the runoff to settle out and gather at the base of the tank. Failing to take action to remove this can result in reducing the capacity of the tank and the deposited silt causing blockage.

2.1.4 Table 2 outlines the maintenance required for the effective operation of the cellular storage tank.

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair / rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect / check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Table 2 - Attenuation storage tank maintenance requirements (CIRIA C753 Table 21.3)

2.2 Permeable Pavements

Source: CIRIA C753 - Table 20.15

2.2.1 Permeable pavements have higher voids than regular pavements to allow surface water to drain through them either directly into the ground, reducing the flow into the surface water drainage network, or through an outlet into the surface water drainage network. Where an

outlet is provided, the peak flow rate into the network is reduced as infiltration through the pavement takes longer than flowing over hard surfaces.

2.2.2 Table 3 outlines the maintenance required for the effective operation of the permeable pavements.

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 3 – Permeable pavement maintenance requirements (CIRIA C753 Table 20.15).

2.3 Outflow Controls – Vortex Control / Hydrobrake

Source: Various manufacturers literature.

2.3.1 A vortex flow control device is a complex control used to limit the discharge rate. Where a simple orifice will limit the discharge by a fixed amount, a vortex control device can vary the discharge rate depending on the head driving the flow. This allows low flow rates to pass during smaller storms, but larger flow rates to pass up to the maximum designed rate during larger storms to prevent the network flooding.

2.3.2 Vortex flow control devices have no moving parts and therefore require little maintenance. Inspections should be completed routinely, or if a blockage is suspected to check for litter and potential blockage risks as detailed in Table 4.

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	None required	n/a
Remedial actions	Remove debris and silt build up	As required
	Repair / replace flow control device	As required
Monitoring	Open manhole and visually inspect device and sump for blockages and debris.	Every 3 – 6 months and if evidence of poor performance
	Inspect flow control device for visible signs of damage	Annually or if evidence of poor performance.

Table 4 – Vortex Control / Hydrobrake maintenance requirements

2.4 Other Components - Manholes (including catchpits), Gullies and Channels

Source: Various guidance

2.4.1 In addition to the aforementioned SuDS components of the network, the network also consists of gullies, channels and other components to collect the flow into the network. It is at these locations that silt is most likely to enter the system.

2.4.2 Table 5 outlines the maintenance required for the effective operation of the other surface water drainage network components.

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove debris from catchment surface / gratings (where may cause risks to performance)	Monthly (and after large storms)
Remedial actions	Remove sediment from manholes and catchpits	Annually or as required
	Repair / rehabilitation of gratings, inlets and outlets	As required
Monitoring	Inspect / check all gratings, manholes and	Annually and after large

Maintenance Schedule	Required Action	Typical Frequency
	catchpits to ensure that they are in good condition and operating as designed.	storm events
	Inspect and identify any features that are not operating correctly. If required take remedial action	Monthly for three months, then six monthly

Table 5 - Other drainage components maintenance requirements

2.5 Green Roofs

Source: CIRIA C753 - Table 12.5

2.5.1 Green roofs are areas of living vegetation, installed on the top of buildings, for a range of reasons including visual benefit, ecological value, enhanced building performance and the reduction of surface water runoff. There are two main types of green roofs

(i) Extensive – low substrate depths and loadings with low maintenance requirements. These are generally inaccessible.

(ii) Intensive – deeper substrates and loadings which can support a variety of plants but require more intensive maintenance. These are usually accessible.

2.5.2 It is important to note that although they are useful in the control and management of surface water runoff, they are constructed over impermeable bases and therefore do not act in the same way as an equivalent greenfield area. The Green Roof Organisation has guidance on the equivalent impermeability of the area, expected volumes that may discharge to evaporation, and runoff rates used to design downstream elements of the surface water network.

2.5.3 Table 7 outlines the maintenance required for green roofs. Where available, manufacturer specific information should take precedence over this.

Maintenance Schedule	Required Action	Typical Frequency
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of water proofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify and sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect the underside of the roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	6 monthly and annually or as required
	During establishment (ie year one), replace dead plants as required (where >5% coverage)	Monthly (but usually responsibility of manufacturer)
	Post establishment replace dead plants as required (where >5% coverage)	Annually (in autumn)

Maintenance Schedule	Required Action	Typical Frequency
	Remove fallen leaves and debris from deciduous foliage	6 monthly or as required
	Remove nuisance and invasive vegetation including weeds	6 monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	6 monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

Table 6 – Green Roof maintenance requirements

2.6 Soakaways

Source: CIRIA C753 - Table 13.1

2.6.1 There are many types of infiltration systems of which soakaways area one. These are excavations filled with granular material to allow voids to form for temporary storage of water whilst is soaks into the ground.

2.6.2 Historically these were rubble filled excavations; however more recently similar devices can be constructed using geotextile lines cellular crates. Alternatively, lined soakaways can be created using perforated precast concrete manhole rings surrounded with a geotextile and backfill. Concrete manhole rings have the advantage (over cellular crates) of being more accessible for cleaning and maintenance. Cellular crates have the advantage of being able to achieve larger volumes of storage.

2.6.3 Soakaways are not appropriate for all sites depending on the soil type and other site constraints. Where they are used, they should be designed by an engineer for the specific site for which they are to be used

2.6.4 Table 7 outlines the maintenance required for soakaways[2]

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect for any sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)

[2] Note, this is for concrete manhole ring soakaways. For other types, refer to the appropriate tables.

Maintenance Schedule	Required Action	Typical Frequency
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect all silt traps and note rate of sediment accumulation	Monthly in first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Table 7 - Soakaway maintenance requirements

2.7 Detention Basins

Source: CIRIA C753 - Table 22.1

2.7.1 Detention basins are landscaped depressions that are normally dry except during and immediately following storm events. They can be online components to manage runoff from regular events or offline to manage exceedance events only. They can be used for infiltration, where the underlying ground conditions are suitable or to attenuate flows until downstream capacity becomes available for controlled discharge. Due to their vegetated bases, they can also be used to provide treatment to flows. Depending on their design, they can also be used as recreational facility.

Detention basins differ from ponds as they are designed to be dry under normal conditions whereas ponds are designed to maintain a constant presence of water.

2.7.2 Table 8 outlines the maintenance required for detention basins.

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season) or as required
	Cut grass – meadow grass in and around basin	Half-yearly (spring- before nesting season and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at stare then as required)
	Inspect inlets, outlets and overflows for blockages and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year) then annually or as required

Maintenance Schedule	Required Action	Typical Frequency
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	
	Remove sediments from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and cuttings	Every 2 years, or as required
	Remove sediments from inlets, outlets forebay and main based when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or returfing	As required
	Realignment of rip-rap	
	Repair/rehabilitation of inlets, outlets and overflows	
	Relevel uneven surfaces and reinstate design levels	

Table 8 – Detention Basin maintenance requirements

2.8 Swales

Source: CIRIA C753 - Table 17.1

2.8.1 Swales are shallow, flat bottomed, vegetated open channels designed to convey, treat and often attenuate surface water runoff. They can be incorporated into site design to enhance the natural landscape and provide biodiversity benefits. Swales can have a variety of profiles and designed to be usually dry (other than during and immediately after rainfall events) or permanently withhold some water. They can be used as surface water conveyance, or if ground conditions allow, infiltration direct to ground.

2.8.2 Table 9 outlines the maintenance required for swales.

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain height within specified design range	Monthly (during growing season or as required)
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months,

Maintenance Schedule	Required Action	Typical Frequency
		quarterly for 2 years, then half yearly
	Inspect inlets and fascility surface for silt accumulation, establish appropriate silt removal frequencies.	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.	As required or if bare soil is exposed over 10% of swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	
	Remove and dispose of oils or petrol residues using safe standard practices	

Table 9 - Swale maintenance requirements

3 Health, Safety and Welfare

3.1.1 All those responsible for maintenance should take appropriate health, safety and welfare precautions for all activities including lone working, if relevant. Risk assessments should always be undertaken before carrying out any works either inside or outside of the site.

3.1.2 The requirements of the Health and Safety at Work Act 1974 and The Construction (Design and Management) Regulations 2015 should be adhered to and any residual risks identified in the Health and Safety File should be managed and information passed on to maintenance operatives through task specific risk assessments.

A.8 Local Authority Drainage Assessment Form