

HUBERT C. LEACH LTD & PTARMIGAN PLANNING

**PROPOSED RESIDENTIAL
DEVELOPMENT:
LAND TO NORTH & EAST OF WARE**



FLOOD RISK & DRAINAGE APPRAISAL
REPORT REF. T810-01
PROJECT NO. T810
JULY 2014

**PROPOSED RESIDENTIAL DEVELOPMENT:
LAND TO NORTH & EAST OF WARE
HERTFORDSHIRE**

FLOOD RISK & DRAINAGE APPRAISAL

**Ardent Consulting Engineers
Suite 207
One Alie Street
LONDON
E1 8DE
Tel: 0207 680 4088
Fax: 0207 488 3736
enquiries@ardent-ce.co.uk**

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DOCUMENT CONTROL SHEET

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	Draft	SJB	SJB		19/05/14
-	Final version.	SJB	SJB	ARF	24/07/14

1.0 INTRODUCTION

- 1.1 Ardent Consulting Engineers has been appointed by Hubert C. Leach Limited and Ptarmigan Planning to advise on the flood risk and drainage aspects associated with the proposed allocation of land situated to the north and east of Ware, in the county of Hertfordshire.
- 1.2 East Hertfordshire District Council is the local planning authority and Thames Water Utilities Ltd is the public drainage authority for the region.
- 1.3 This statement sets out the baseline conditions and a preliminary assessment of the suitability of the site to deliver the development proposals in accordance with the requirements specified in the national planning legislation.
- 1.4 Land has been identified to the north and east of Ware town to potentially provide in the region of up to 3,000 residential dwellings with associated infrastructure and could extend to circa 300 hectares.
- 1.5 The parcels of land are centred on an Ordnance Survey grid reference of 536800mE, 215900mN.

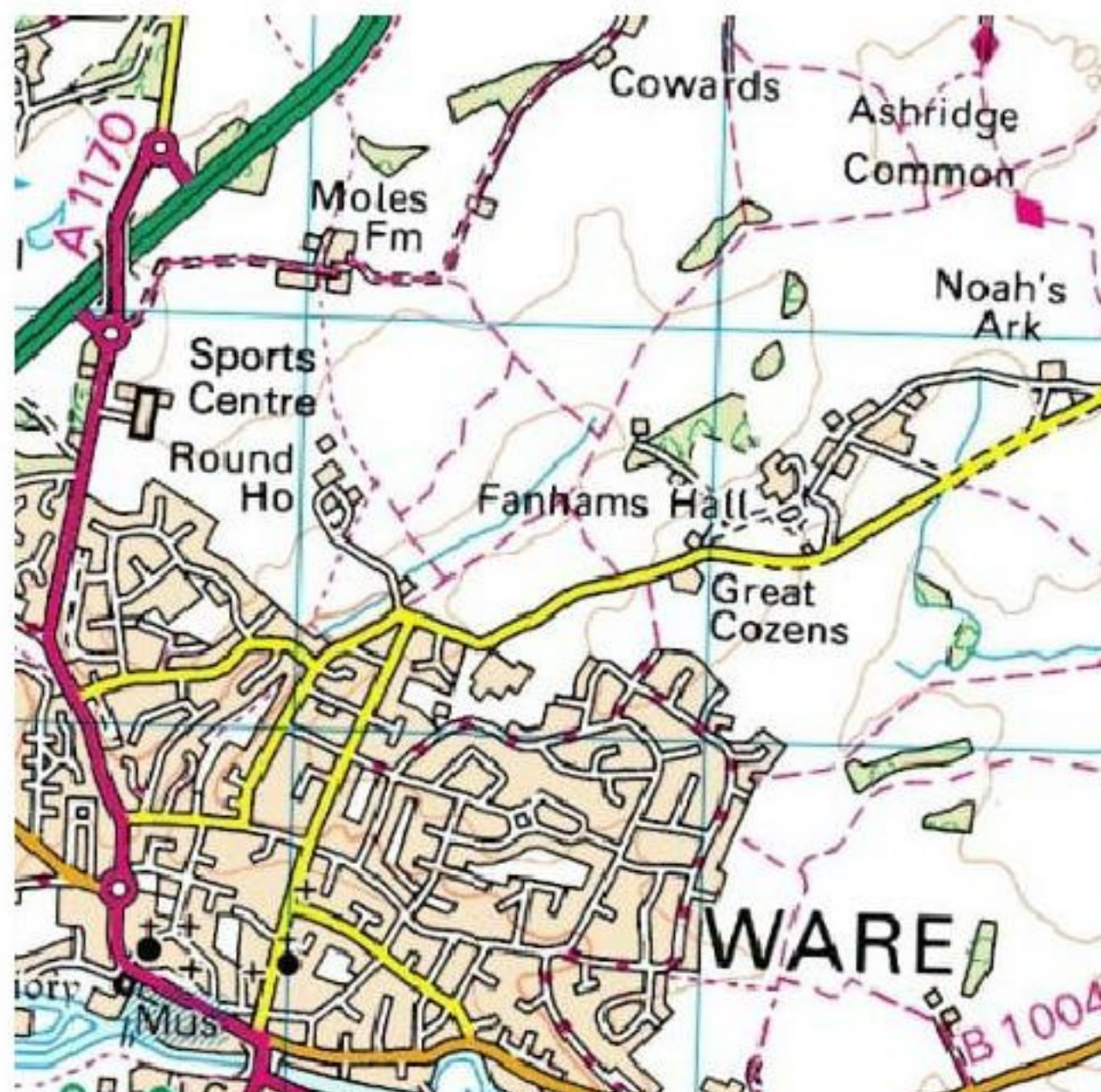


Figure 1 – Site's Location

2.0 FLOOD RISK & SURFACE WATER DRAINAGE

Flood Risk

- 2.1 From a review of the Environment Agency's mapping, the site is not shown to lie within the indicative undefended floodplain of any designated main river/watercourse and is therefore considered to be at a low risk of flooding, as defined by the latest legislation (National Planning Policy Framework – NPPF, published in March 2012).
- 2.2 An extract of the Environment Agency's indicative floodplain mapping is shown in **Figure 2** below:

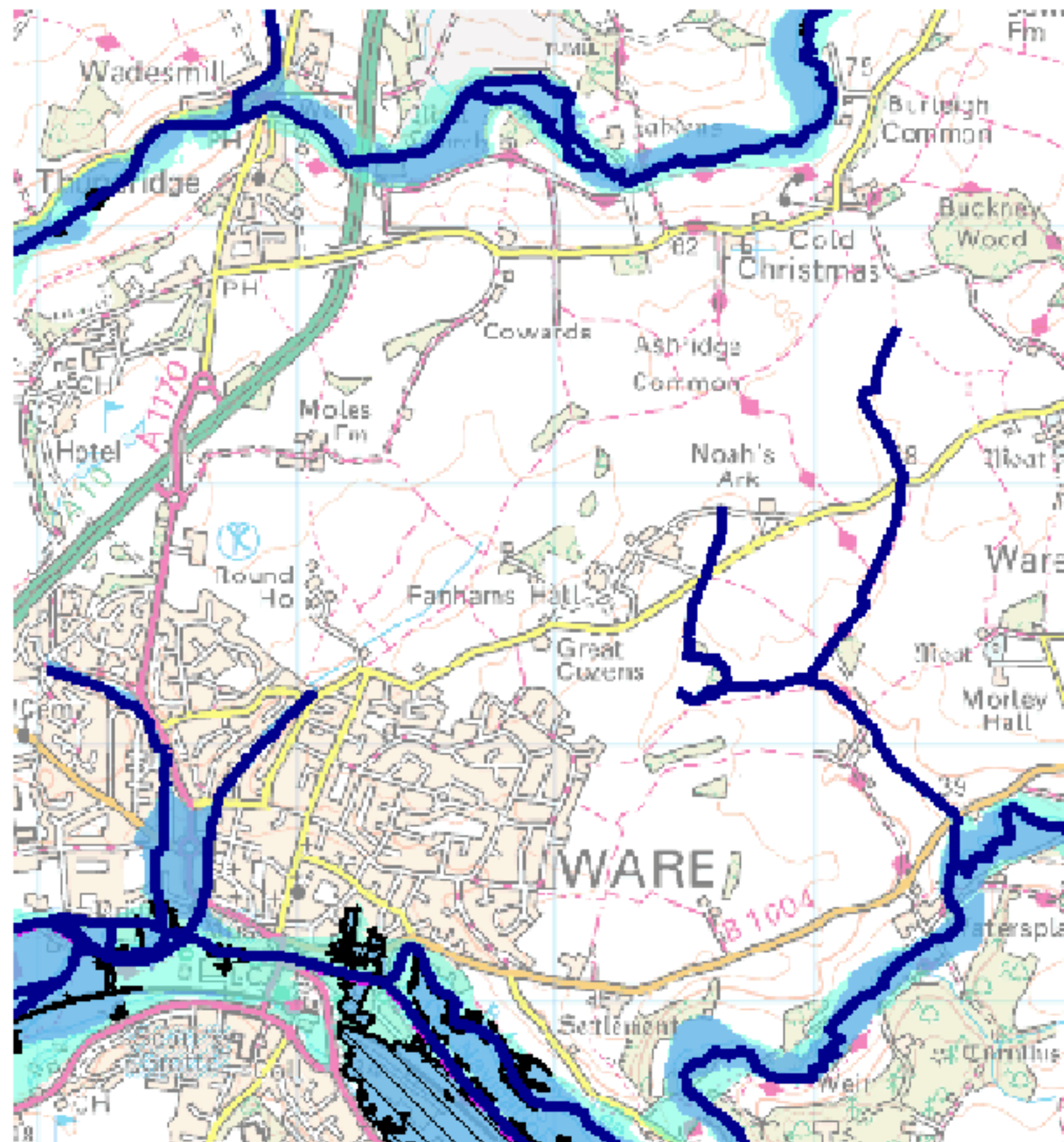


Figure 2 – Indicative Floodplain Extent

- 2.3 There are designated main river/watercourses known as the Fanhams Tributaries which traverse the land and generally convey flows in a southerly direction to the River Ash and ultimately, the River Lee.

- 2.4 It is anticipated that any development masterplan will retain the rivers/watercourses with appropriate easements for future maintenance operations, in consultation with the Environment Agency.
- 2.5 A further search also confirms that the land is not at risk of flooding from any nearby reservoir either, as illustrated in **Figure 3** below:



Figure 3 – Reservoir Flood Extent

- 2.6 Sites which are deemed to be at a low probability of flooding are described as land having less than 1 in 1,000 annual probability of river or tidal flooding and classified as 'Flood Risk Zone 1' sites.
- 2.7 The NPPF uses the concept of sequential testing and risk based approach to flood risk and development. The sequential test aims to steer new development to areas with the lowest probability of flooding (i.e. Flood Risk Zone 1). Referring to Table 2 contained within the NPPF classifies residential schemes as a 'more vulnerable' land class usage, in terms of flood risk:

More vulnerable

- Hospitals.
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste⁶.
- Sites used for holiday or short-let caravans and camping, *subject to a specific warning and evacuation plan.*⁷

2.8 Table 3 within the NPPF, however, determines that a residential scheme within a Flood Risk Zone 1 area is an appropriate form of development in this site's particular location:

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	*	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	*	*	*

Key: ✓ Development is appropriate.
 * Development should not be permitted.

Strategic Flood Risk Assessment

2.9 A Strategic Flood Risk assessment was prepared on behalf of East Hertfordshire District Council in November 2008 which confirms that the land has not been subject to any major historical flooding issues, as illustrated in **Figure 4** on the following page:

Public Sewers

- 2.12 The public sewer asset record plans have been obtained from Thames Water and included within **Appendix A** of this report for further reference.
- 2.13 The record plans illustrate that the large residential area to the south-west of the land is served by a public network.
- 2.14 No major diversion or protection works would be required to accommodate the development scheme.

SuDS/Surface Water Drainage

- 2.15 To dispose of the surface water run-off generated by the land, a sustainable urban drainage system (SuDS) will be devised for each parcel of land which adopts the principles outlined in the NPPF.
- 2.16 In devising an appropriate SuDS/surface water drainage strategy, the use of infiltration drainage techniques will be considered which seeks to convey the surface water run-off to the underlying soil, providing suitable ground conditions exist. It is therefore anticipated that a geotechnical investigation will be carried out to assess the feasibility of using infiltration drainage techniques.
- 2.17 A range of SuDS techniques could be used across the land which could range from:
- Green/brown roofs;
 - Basins and ponds;
 - Filter strips and swales;
 - Infiltration devices;
 - Permeable surfaces;
 - Tank/geo-cellular systems.
- 2.18 Post-development discharge rates will be calculated for each parcel of land to ensure that risk of flooding is not increased elsewhere as a result of developing the land.
- 2.19 SuDS/surface water drainage strategies will be prepared and hydraulically modelled to demonstrate compliance with the NPPF and

accommodate the run-off generated by a 1:100 year rainfall event, including an allowance for any potential climate change impact.

- 2.20 Detailed discussions will be held with Thames Water and Environment Agency to agree the SuDS/surface water drainage strategy and associated discharge rates, points of connection etc.
- 2.21 The watercourses will be retained and the opportunity to improve the ecology and biodiversity will also be considered.

3.0 FOUL WATER DRAINAGE

- 3.1 As mentioned earlier in this report, the large residential area to the south-west of the land is served by a public drainage network. No major diversion or protection works are anticipated to accommodate the development proposals.
- 3.2 A copy of the public sewer record plans has been included within **Appendix A** of this report for further reference.
- 3.3 The extent of land identified could potentially be developed to provide circa 200 to 3,000 residential dwellings.
- 3.4 200 to 3,000 residential dwellings could generate a peak foul water flow of approximately 10 to 140 litres/sec, based on 4,000 litres/unit dwelling per 24 hours (as stated in Sewers for Adoption).
- 3.5 Discussions will be held with Thames Water at an early stage to confirm that the foul water flows can be accommodated within the drainage infrastructure.
- 3.6 Preferred points of connection will also be discussed and agreed with Thames Water.
- 3.7 Due to the natural sloping topography of the land, it is anticipated that a traditional gravity draining system will be provided where possible.
- 3.8 The use of bulk fill earthwork operations and pumping stations will be minimised.

4.0 SUMMARY & RECOMMENDATIONS

- 4.1 The site is considered to be situated within a Flood Risk Zone 1 area at a low risk of flooding, and a residential scheme is therefore considered to be an appropriate form of development in this particular location.
- 4.2 A SuDS strategy which will comply with the requirements of the NPPF can be provided to accommodate the surface water run-off generated by the proposed development scheme.
- 4.3 Proposals will include the provision of a range of SuDS devices to accommodate the surplus volumes generated by a 1:100 year rainfall event (including an allowance for any potential climate change impact).
- 4.4 SuDS proposals will be provided in consultation with the relevant authorities (including SuDS Approval Body if in existence) to ensure the strategy complies with the necessary policy requirements.
- 4.5 Any future planning application will be accompanied by a site-specific Flood Risk Assessment to comply with the requirements of the NPPF.
- 4.6 Detailed discussions will be held with Thames Water regarding the disposal of the foul water flows.
- 4.7 No major diversion or protection works are anticipated to accommodate the development proposals.

Appendix A
Public Sewer Record Plans

Asset Location Search



Thames Water Property Searches
12Vastern Road
READING
RG1 8DB

Search address supplied T810 -Land North & East Of Ware
Herts

Your reference N/A

Our reference ALS/ALS Standard/2014_2756733

Search date 15 May 2014

You are now able to order your Asset Location Search requests online by visiting
www.thameswater-propertysearches.co.uk



Asset Location Search



Search address supplied: T810 -Land North & East Of Ware, Herts,

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

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

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

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk

Asset Location Search



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:

TL3614SE
TL3715SW
TL3714SW
TL3615SE
TL3515NE
TL3516SE
TL3615SW
TL3515SE
TL3714NW
TL3515NW
TL3516NE

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

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

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

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

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

TL3615NW
TL3616NE
TL3815SW
TL3716SE
TL3816SW
TL3616SE
TL3715NW
TL3616NW
TL3815NW
TL3715NE

Asset Location Search



TL3516SW
TL3714NE
TL3716SW
TL3615NE
TL3714SE
TL3616SW
TL3715SE

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.

Following examination of our statutory maps, Thames Water has been unable to find any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

New Connections / Diversions
Thames Water
Network Services Business Centre
Brentford
Middlesex
TW8 0EE

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TL3615NW	Affinity Water
TL3616NE	Affinity Water
TL3815SW	Affinity Water
TL3716SE	Affinity Water
TL3614SE	Affinity Water

Asset Location Search



TL3715SW	Affinity Water
TL3714SW	Affinity Water
TL3816SW	Affinity Water
TL3616SE	Affinity Water
TL3715NW	Affinity Water
TL3615SE	Affinity Water
TL3515NE	Affinity Water
TL3516SE	Affinity Water
TL3616NW	Affinity Water
TL3615SW	Affinity Water
TL3515SE	Affinity Water
TL3815NW	Affinity Water
TL3715NE	Affinity Water
TL3714NW	Affinity Water
TL3515NW	Affinity Water
TL3516SW	Affinity Water
TL3516NE	Affinity Water
TL3714NE	Affinity Water
TL3716SW	Affinity Water
TL3615NE	Affinity Water
TL3714SE	Affinity Water
TL3616SW	Affinity Water
TL3715SE	Affinity Water

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ

Tel: 0845 7823333

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.

Asset Location Search



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

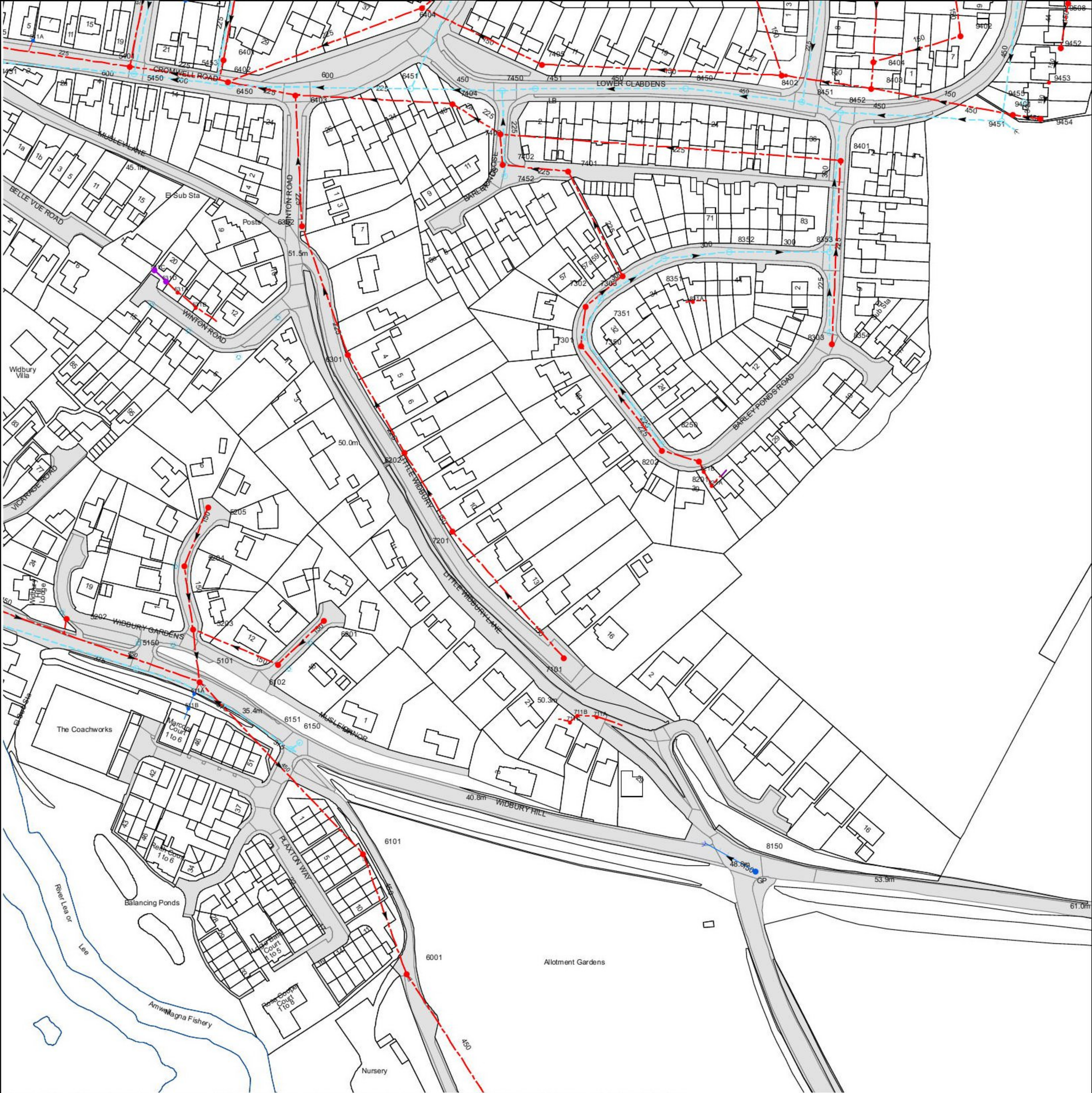
Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

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: 0845 850 2777
Email: developer.services@thameswater.co.uk



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 536750,214250

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

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8303	61.3	59.84
8354	61.15	59.38
8353	58.64	56.84
8401	55.29	53.83
9451	55.88	54.42
9454	n/a	n/a
9401	n/a	n/a
8452	54	52.34
9455	n/a	n/a
8403	54.84	52.42
9453	n/a	n/a
8404	55.22	52.94
9452	n/a	n/a
9402	57.1	56.14
9508	n/a	n/a
6404	.01	n/a
7201	.01	n/a
7404	49.79	47.03
7403	51.69	50.12
7450	49.77	47.74
7402	53.7	51.9
7452	54.26	52.83
7451	50.44	48.67
7405	50.57	49.17
7401	54.51	53.06
7301	60.01	57.43
7350	60.04	58.57
7302	59.92	57.3
7351	59.79	58.35
7303	59.6	57.01
8202	60.49	57.98
8250	60.54	59.16
8351	59.34	57.77
8450	52.25	50.35
831A	n/a	n/a
8201	60.83	58.23
8352	58.91	57.36
8402	54.12	51.37
8451	53.69	51.8
531A	n/a	n/a
531D	n/a	n/a
531C	n/a	n/a
6302	51.64	49.38
6403	46.25	43.65
6451	n/a	n/a
6450	45.3	43.95
6402	45.24	43.19
5450	43.82	42.1
5401	43.77	42.67
5453	45.45	44.35
6401	45.6	44.52
541A	n/a	n/a
5250	n/a	33.41
5202	34.8	32.44
5351	n/a	46.71
5253	n/a	n/a
5204	38.14	36.89
5350	n/a	46.65
5203	36.73	35.82
531B	n/a	n/a
5205	41.54	40.37
6350	n/a	46.38
6351	n/a	48.17
6250	n/a	39.34
6201	41.73	40.33
6301	53.26	50.68
6202	52.7	n/a
821B	n/a	n/a
821A	n/a	n/a
6001	35.01	31.17
8150	49.71	48.64
6101	34.26	31.2
6150	36.38	34.93
6151	36.48	35.51
711C	n/a	n/a
711A	n/a	n/a
711B	n/a	n/a
511B	n/a	n/a
511A	n/a	n/a
5101	34.69	31.3
6152	n/a	37.17
5150	34.06	33
6102	37.87	36.72
7101	54.61	53.01
5252	n/a	34.62
5251	n/a	34.03

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 537250,215250

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0001	n/a	n/a
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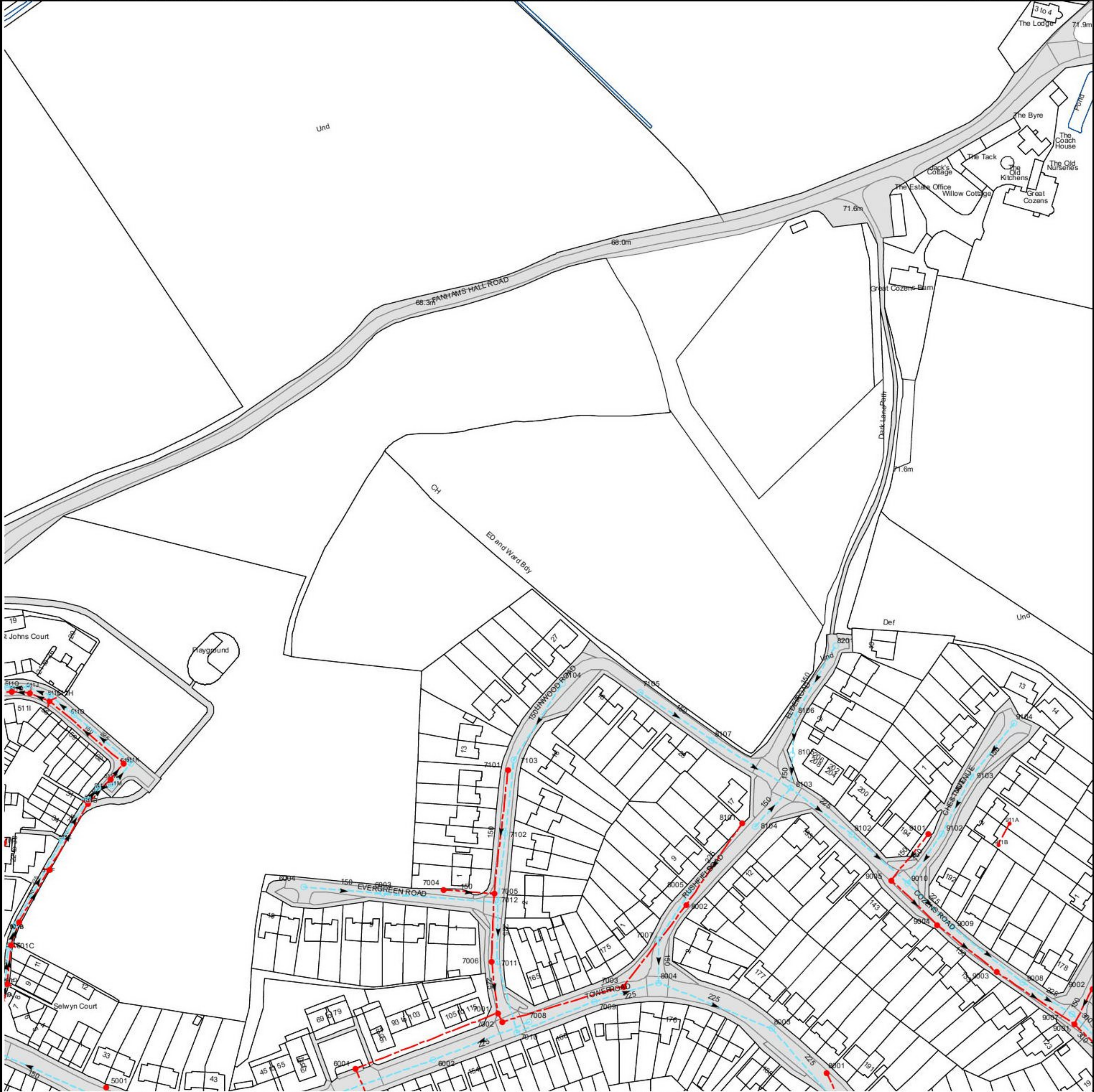
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Manhole Reference	Manhole Cover Level	Manhole Invert Level
011D	n/a	n/a
011C	n/a	n/a
011B	n/a	n/a
011A	n/a	n/a
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Manhole Reference	Manhole Cover Level	Manhole Invert Level
8001	68.15	66.09
9001	67.22	65.57
9007	67.27	65.3
9002	67.65	65.86
9008	68.36	66.2
9003	68.57	66.59
9009	69.05	67.11
9004	69.17	67.19
9010	69.68	67.6
9005	69.86	67.9
911B	n/a	n/a
8102	68.13	67.6
9102	70	67.89
9101	70.2	68.24
911A	n/a	n/a
9103	70.17	68.49
9104	70.4	68.9
8201	71.4	70.42
7009	69.57	67.67
7003	69.57	67.21
7105	70.52	69.53
7007	69.7	68.35
8004	69.42	67.58
8002	69.94	67.87
8005	70.06	68.63
8107	70.71	69.12
8101	70.52	68.7
8104	70.43	69.2
8003	68.81	67.29
8103	70.55	68.8
8105	70.86	68.97
8106	70.99	69.43
5001	68.69	67.09
6001	69.39	65.89
6002	69.39	68.07
7010	69.47	67.91
7008	69.53	68.49
7002	69.46	66.82
7001	69.48	66.74
7011	69.58	68.11
7006	69.57	67.38
501B	67.946	66.15
501A	67.95	65.66
7012	69.68	68.24
6003	69.83	68.74
7005	69.71	67.6
7004	70.06	68.14
6004	69.93	69.04
511F	67.677	65.43
511E	67.478	65.75
7102	69.89	68.58
511B	67.271	65.02
511C	67.235	65.51
511A	67.169	65.44
511M	67.047	65.32
511N	66.935	64.68
7101	69.99	68.15
511L	66.771	64.52
511K	66.868	65.14
7103	70.02	68.89
511D	66.065	64.37
511H	65.695	63.14
511G	65.498	63.7
511I	65.442	62.89
511J	65.187	63.39
7104	70.27	69.31
511O	65.229	62.68
511Q	64.906	59.39
501F	68.215	66.33
501D	68.241	65.89
501E	68.069	66.22
501C	68.086	65.75
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Manhole Reference	Manhole Cover Level	Manhole Invert Level
5701	68.84	n/a
5801	68.97	n/a
5802	.01	n/a
5901	69.54	65.9
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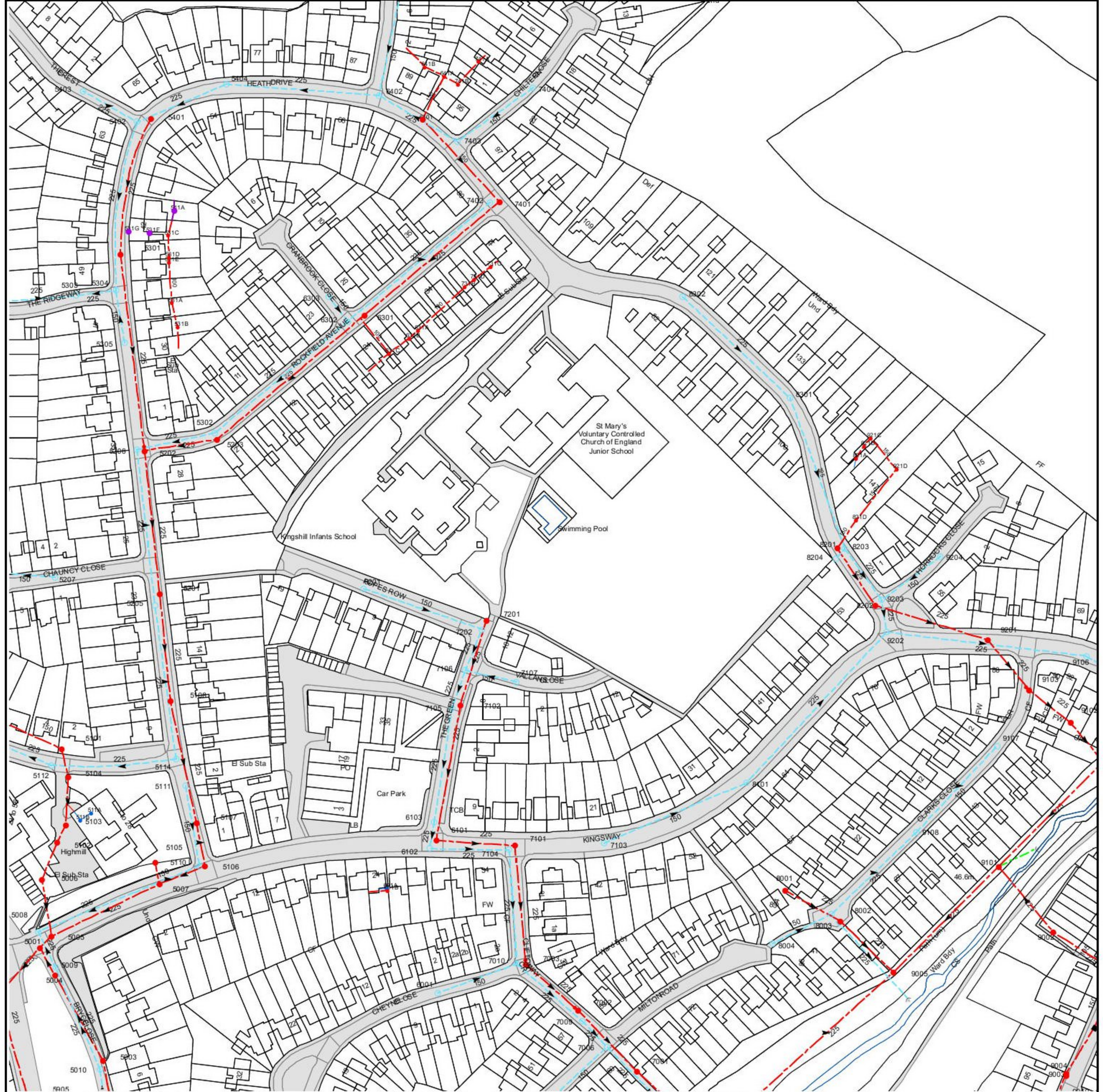
NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6105	n/a	66.58
6102	n/a	n/a
6103	n/a	n/a
6202	n/a	n/a
6203	n/a	n/a
6301	n/a	68.51
641A	n/a	n/a
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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
411O	62.324	60.82
411B	62.731	58.95
411L	64.045	60.53
411P	62.35	59.13
411M	63.936	58.91
411J	64.775	62.22
411K	64.763	59.3
2101	58.22	56.72
3250	58.42	n/a
421B	62.875	60.29
421C	64.953	58.84
4251	62.34	61.39
421F	62.125	59.75
421D	61	58.63
421A	n/a	n/a
421E	60.78	58.6
4252	59.91	58.36
3251	57.44	56.53
3252	57.28	55.99
321B	56.9	54.83
321A	54.3	52.73
2203	54.56	52.48
221A	n/a	52.41
221B	55.5	52.57
2202	52.44	51.12
2002	64.68	63.08
4051	67.21	n/a
2003	64.87	63.25
4050	68.08	66.36
401A	68.206	65.96
401B	68.177	66.48
2004	65.11	63.74
511P	66.582	64.68
411S	66.454	64.8
411N	65.591	63.87
411D	64.777	63.18
411A	65.355	63.63
411G	64.327	62.81
411F	64.383	61.22
411R	63.526	62.18
411I	63.485	60.34
411Q	62.487	59.85
3150	59.89	58.83
411C	62.897	60.66
411H	62.49	60.74
2001	64.78	62.98
2050	64.71	64.06
101A	n/a	n/a
2051	64.03	63.32
0001	55.07	50.7
1002	62.45	61.32
2005	63.82	59.67
1051	61.54	60.86
1050	61.34	60.42
0101	52.44	51.09
1150	57.67	56.82
1101	59.14	56.54
1151	n/a	52.82
0102	53.48	51.93
1102	55.02	53.5
0103	52.07	50.96
0107	45.98	44.25
0104	51.88	49.93
0153	48.51	46.2
0154	48.14	46.3
0105	51.74	49.18
0106	48.02	n/a
1201	53.6	52.35
1202	52.15	49.59
2201	53	50.36

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 535750,215250

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5010	51.38	49.39
5003	51.35	49.3
5004	47.3	45.46
5009	47.24	45.4
5001	46.93	45.13
5005	47.41	45.89
5008	47.03	44.33
7403	66.24	64.91
5402	63.55	61.03
6401	66.43	64.11
5401	63.71	60.48
6402	66.58	64.88
5403	62.67	61.33
7404	66.4	65.18
5404	65.35	63.85
741B	n/a	n/a
641A	n/a	n/a
641B	n/a	n/a
741A	n/a	n/a
5207	59.63	58.92
5303	62.26	60.24
5304	63	60.7
5301	63.12	60.24
5305	62.91	61.41
531G	n/a	n/a
5206	62.58	60.97
5202	62.55	59.86
531F	n/a	n/a
5201	61.18	59.53
531C	n/a	n/a
9102	48.3	n/a
9103	50.71	48.31
9106	50.21	48.78
9201	52.62	51.35
9202	54.64	52.99
8202	55.38	53.69
9203	55.42	54.15
8204	57.09	56.23
9204	56.07	54.93
8203	57.04	55.72
8201	57.21	55.25
821D	n/a	n/a
921D	n/a	n/a
821A	n/a	n/a
821B	n/a	n/a
921C	n/a	n/a
9003	56.74	50.82
9004	56.71	50.79
9005	45.36	43.69
9002	.01	n/a
8002	47.36	45.92
8003	47.57	46.22
9101	45.74	43.94
9108	47.97	46.65
9107	48.54	47.36
7001	50.69	47.99
7006	51.65	48.65
7009	52.24	50.5
7002	52.68	50.66
6001	56.36	54.96
7003	56.14	53.5
7010	56.11	54.47
8004	49.03	47.64
5114	59.51	57.83
5111	59.21	57.68
5107	58.07	56.13
5110	56.72	54.79
5106	56.71	54.91
601A	n/a	n/a
601B	n/a	n/a
6102	59.42	57.77
6103	59.44	58.12
6101	59.41	57.77
7105	61.53	59.61
7104	58.94	57.29
7101	58.94	57.3
7103	57.53	56.06
8101	55.75	53.99
8001	50.57	n/a
7102	61.58	59.65
5108	60.09	57.7
7107	61.34	60.47
7106	62.03	60.01
7202	62.25	60.42
7201	62.29	60.5
6201	63.09	61.5
5203	63.52	61.91
5302	63.56	61.99
8301	61.52	59.92
631C	n/a	n/a
631B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
631A	n/a	n/a
531B	n/a	n/a
6302	65.2	62.43
6301	65.28	63.03
531A	n/a	n/a
8302	63.79	62.21
6303	65.26	63.69
731B	n/a	n/a
731D	n/a	n/a
731C	n/a	n/a
531E	n/a	n/a
531D	n/a	n/a
541A	n/a	n/a
7402	65.95	63
7401	65.94	63.74
5007	52.1	50.08
5006	52.66	51.31
5105	56.6	52.75
5102	55.36	n/a
5103	55.93	53.18
511B	n/a	n/a
511A	n/a	n/a
5104	57.24	53.46
5112	56.8	53.66
5101	.01	n/a
5205	61.04	59.36
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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 537250,214750

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Manhole Reference	Manhole Cover Level	Manhole Invert Level
0802	n/a	n/a
0805	n/a	n/a
1801	n/a	n/a
0803	n/a	n/a
0804	n/a	n/a
0801	n/a	n/a
1902	n/a	n/a
0904	n/a	n/a
1904	n/a	n/a
1903	n/a	n/a
0902	n/a	n/a
1901	n/a	n/a
0903	n/a	n/a
0901	n/a	n/a
0701	n/a	n/a
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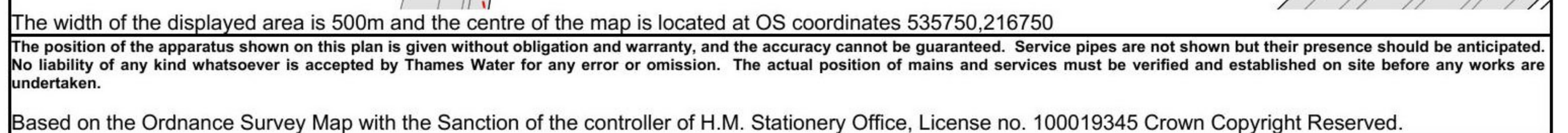
The width of the displayed area is 500m and the centre of the map is located at OS coordinates 535250,215750

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

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Manhole Reference	Manhole Cover Level	Manhole Invert Level
151D	n/a	n/a
151E	n/a	n/a
151C	n/a	n/a
151B	n/a	n/a
151A	n/a	n/a
4501	61.55	n/a
4601	66.81	n/a
4701	68.19	n/a
051A	n/a	n/a
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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8802	76.98	74.16
8801	77.02	74.19
8803	77.08	74.58
881F	n/a	n/a
881B	n/a	n/a
881E	n/a	n/a
881D	n/a	n/a
881C	n/a	n/a
981C	n/a	n/a
881A	n/a	n/a
981B	n/a	n/a
981A	n/a	n/a
8901	77.78	75.36
8903	78.19	76.39
571A	n/a	n/a
6601	74.18	n/a
6701	76.29	n/a
6801	76.67	73.26
7802	75.61	n/a
7901	73.6	n/a
7801	77.03	73.64
8804	76.88	73.93
8902	77.94	75.53
6501	72.36	69.36

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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

Notes:

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

Sewer Fittings

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

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

Operational Controls

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

	Control Valve
	Drop Pipe
	Ancillary
	Weir

End Items

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

	Outfall
	Undefined End
	Inlet

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
	Culverted Watercourse
	Proposed
	Abandoned Sewer
	Gully

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 0845 9200 800.

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 him 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.



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