Rossi Long Consulting

Project Ref: RAC/SJB/161513

Date: 03 October 2017

Flood Risk Screening

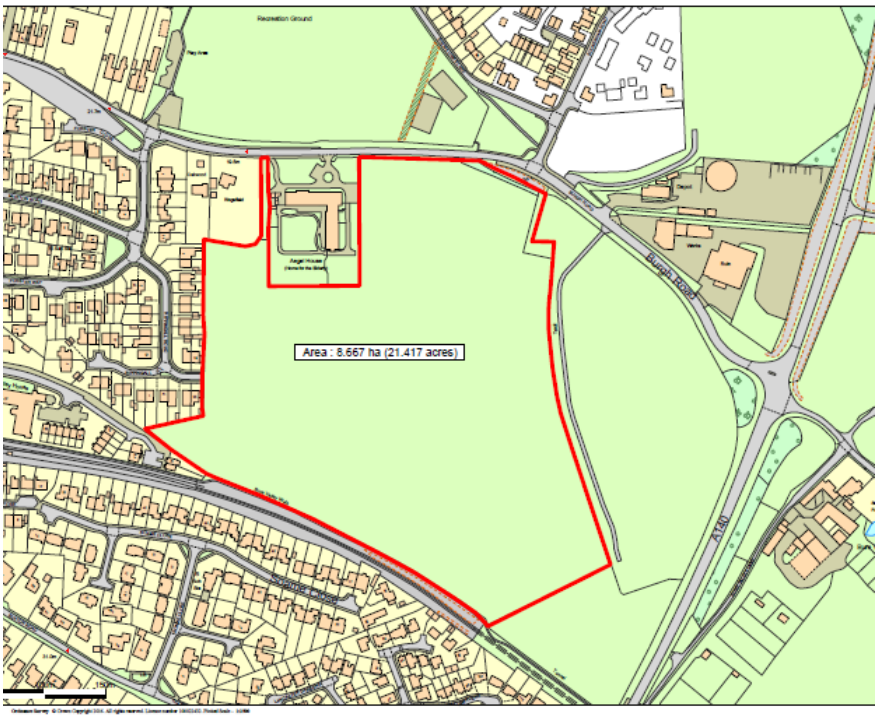
Land south of Burgh Road

Aylsham

Norfolk

1.0 Introduction

We were instructed by Kier Living Ltd to prepare a Flood Risk Screening and Scoping Exercise for land south of Burgh Road, Aylsham. The site is being promoted for residential development and this report is required to assess preliminary flood risk and surface water drainage issues. A location plan is shown below:



2.0 Site Description

The site, 8.667 hectares of land, is situated south of Burgh Road, Aylsham and to the west of the A140 and north of the Bure Valley Railway. The Ordnance Survey grid reference at the centre of the site is TG 200 265. Ordnance Survey mapping shows that the 20.0m AOD contour passes through the centre of the site with ground levels falling towards the north-east. The River Bure is located east of the A140 road with ground levels below 10.0m AOD.

A site survey has been completed and the contours confirm the general fall of the land towards the north-east corner. Ground levels in the south-west corner are at about 23.5m AOD, falling to 12.50m AOD in the north-east corner. The survey confirms that foul and surface water sewers are located both on the site and in Burgh Road to the north.

3.0 Ground Conditions

The Desk Study Summary Site Investigation and BGS mapping show the south of the site is situated upon superficial deposits of Brickearth (Clay, Silt and Sand). No superficial deposits are shown across the north of the site. The underlying bedrock geology is the Wroxham Crag Formation (Sand and Gravel).

In terms of groundwater vulnerability, the south of the site overlies a Secondary B Aquifer with respect to the superficial geology. The site overlies a Principal Aquifer with respect to bedrock geology.

The site is not situated within a Groundwater Source Protection Zone.

4.0 Flood Risk

Fluvial Flooding: Environment Agency fluvial flood risk mapping is shown below and confirms that the site is situated in Flood Zone 1. Flood Zone 1 is a 'low probability' flood zone and comprises land assessed as having a less than 1 in 100 annual probability of river flooding in any year (<0.1%). All uses of land are appropriate in Zone 1 and the National Planning Policy Framework (NPPF) Sequential and Exception Tests are not required (see overleaf):

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Flood probability

Your proposed development is in an area with a low probability of flooding

FLOOD ZONE 1

Land and property in flood zone 1 have a low probability of flooding

More information about flood zones

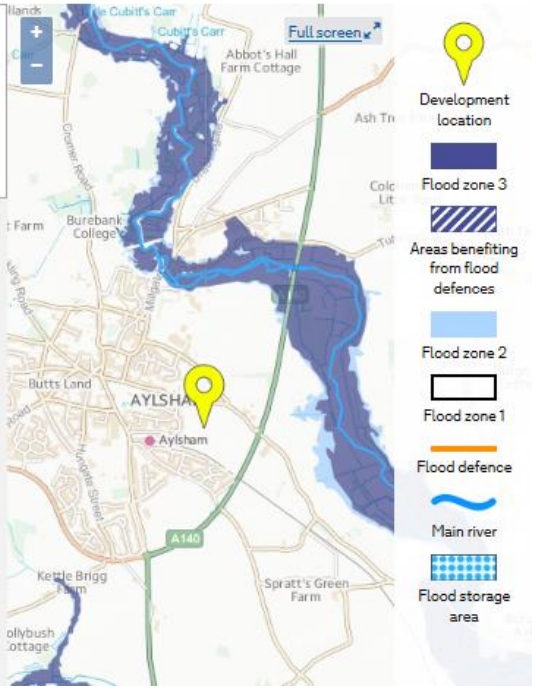
1 You don't need to do a flood risk assessment if your development is in flood zone 1 and:

- smaller than one hectare
- is not affected by sources of flooding other than rivers and the sea, for example surface water drains

2 If your development is in flood zone 1 and:

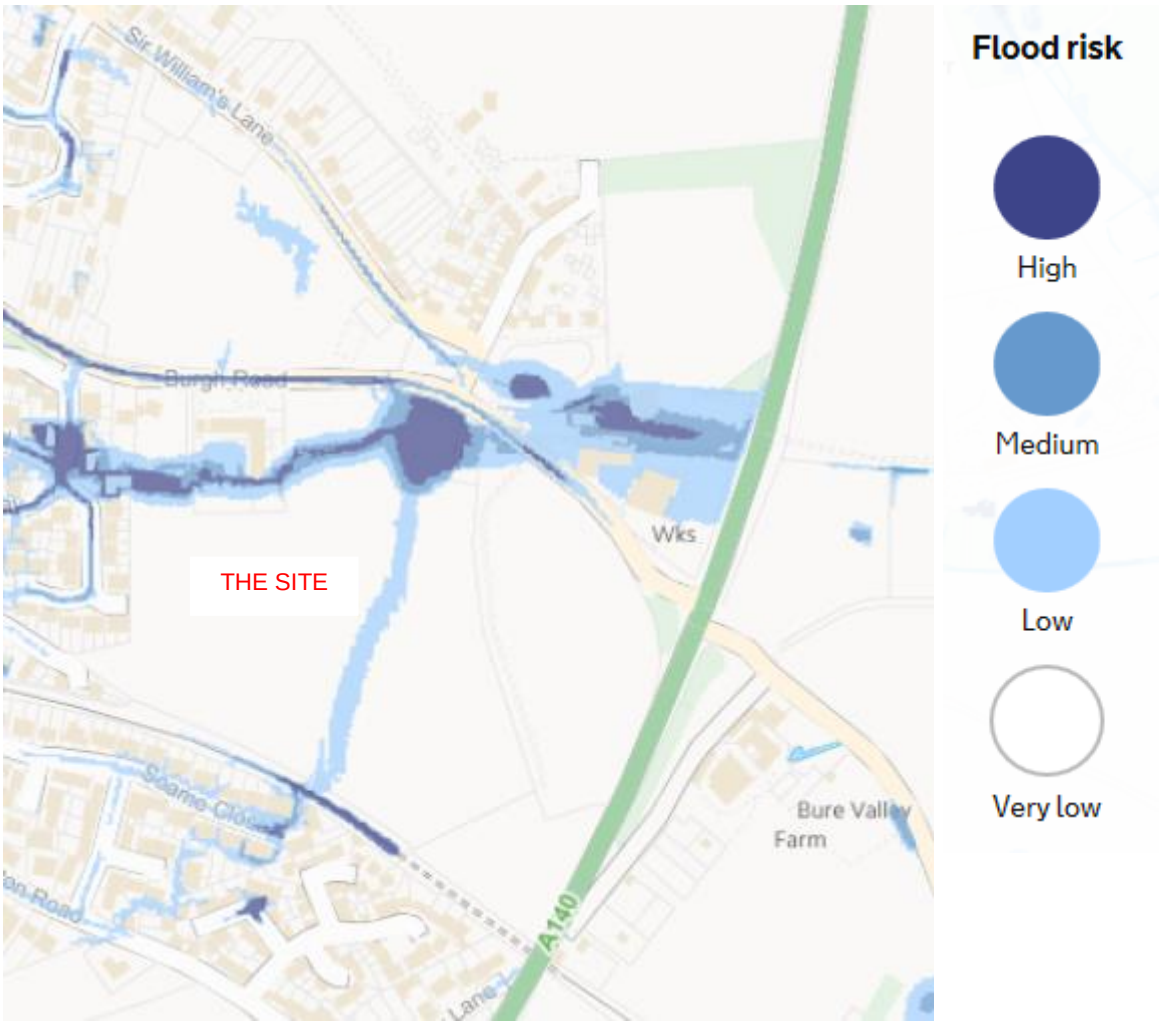
- larger than one hectare
- is affected by sources of flooding other than rivers and the sea, for example surface water drains

you can learn more about flood risk assessment in flood zone 1



For development proposals on sites in Zone 1 comprising one hectare or above, a Flood Risk Assessment is principally required to consider the management of surface water run-off together with flood risk from sources other than rivers and the sea. Surface water arising from a developed site should, as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Surface water flooding occurs when intense rainfall is unable to soak into the ground or enter drainage systems but lies on or flows over the ground instead. The Environment Agency publishes mapping showing the risk of flooding from surface water; an extract of which is shown overleaf:



The mapping shows an area of land close to the north boundary at ***high risk*** of surface water flooding. 'High' risk means that each year this area has a chance of flooding of greater than 3.3% (> 1 in 30); 'Medium' risk means that each year this area has a chance of flooding of between 1.0% and 3.3% (1 in 100 to 1 in 30); 'Low' risk means that each year this area has a chance of flooding of between 0.1% and 1.0% (1 in 1000 to 1 in 100); and 'Very low' risk means that each year this area has a chance of flooding of less than 0.1% (< 1 in 1000).

Further interrogation of the surface water flood risk map indicates a potential depth of flooding of 'over 900mm' for all scenarios in the 'high' risk area. If the site is developed, this area should be reserved for open space with all housing located in areas at 'very low' or 'low' risk of surface water flooding.

Groundwater flooding occurs when water levels in the ground rise above surface elevations. BGS mapping includes information on a nearby borehole that indicates an 'at rest' GWL 11.0m below ground level. The risk of groundwater flooding is 'low' but is subject to confirmation from detail site investigation.

Flooding from surface water sewers occurs when sewers are overloaded following heavy rainfall. Surface water sewers are shown crossing the site and Anglian Water, Broadland Council and the LLFA should be consulted regarding any records of this type of flooding.

Flooding from Reservoirs and other artificial sources: The Environment Agency publishes mapping that shows the extent of flooding from these sources and confirms the site is not at risk.

5.0 Surface Water Drainage

BGS mapping indicates that site ground conditions may not be suitable for infiltration of surface water run-off. National Planning Policy requires that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate. Generally, the aim should be to discharge surface run-off as high up the following hierarchy of drainage options as reasonably practicable:

- Into the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain or another drainage system;
- To a combined sewer.

Site investigation is required to confirm ground conditions and should include infiltration testing in accordance with BRE Digest 365 requirements. For any off-site discharge of surface water, run-off should be limited to the equivalent 'greenfield' run-off rate for all storms up to and including the 1 in 100 year event plus allowance for climate change. This is to ensure that the development does not increase the risk of flooding on or off the site. Peak flows would need to be attenuated in a lagoon or below ground storage tanks with a flow control device. If there are no watercourses available, agreement will need to be reached with Anglian Water for a discharge to a public surface water sewer. Public sewer details are included in the Appendix to the rear of this report.

The development layout will need to accommodate the existing on-site public sewers providing an appropriate easement distance dependent upon the diameter and depth of the sewers. Easement distances in the range of 3.0 – 6.5m either side of the centre line of the sewer will be required.

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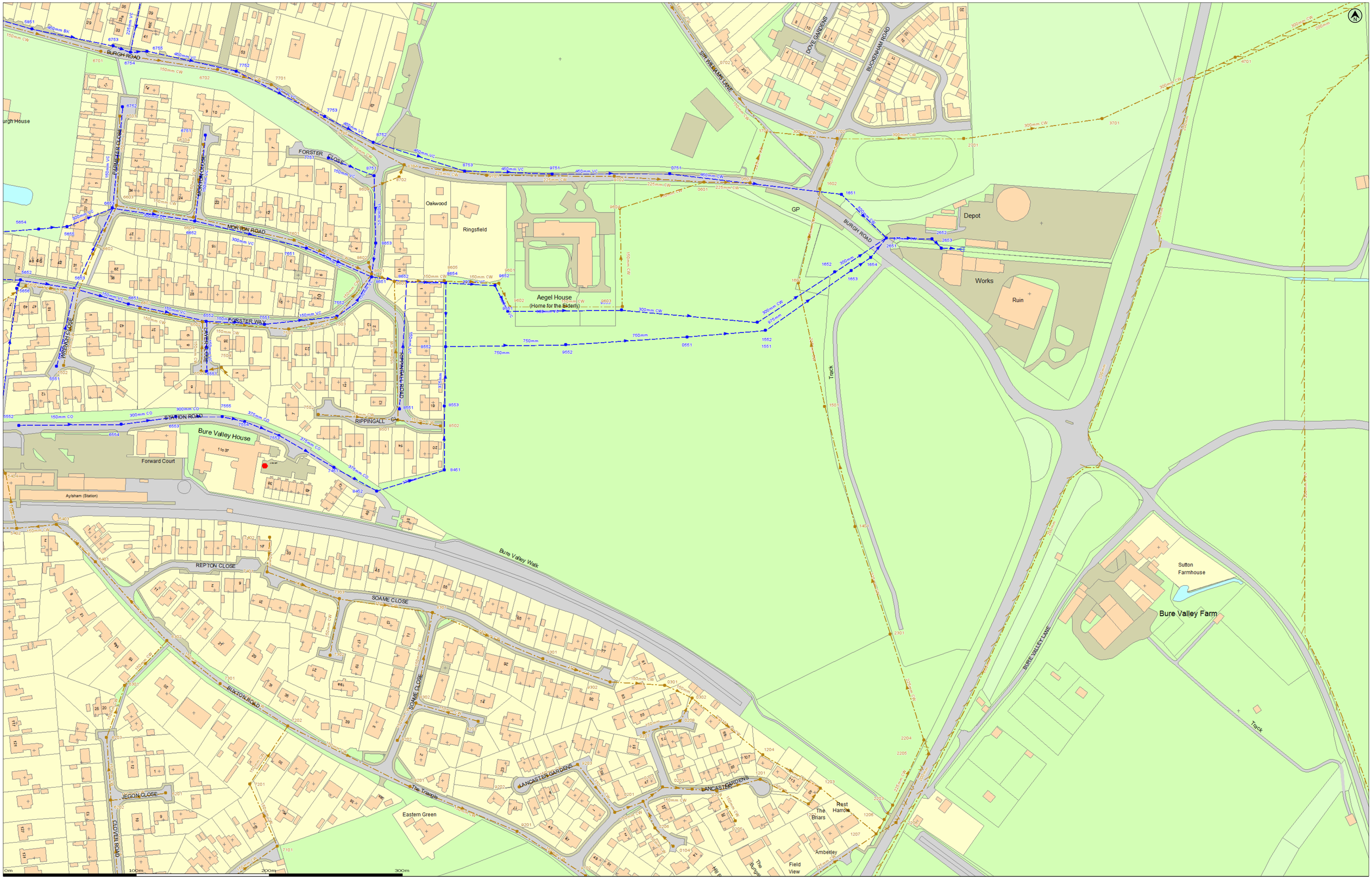
Appendix – Public Sewer Details



(c) Crown copyright and database rights 2017 Ordnance Survey 100022432 | Date: 27/02/17 | Scale: 1:1250 | Map Centre: 620050,326505 | Data updated: 24/10/16 | Our Ref: 214701 - 1 | Wastewater Plan A1

- Foul Sewer
- Surface Sewer / Combined Sewer
- Final Effluent
- Rising Main (Colour denotes effluent type)
- Private Sewer (Colour denotes effluent type)
- Decommissioned Sewer (Colour denotes effluent type)
- Outfall (Colour denotes effluent type)
- Inlet (Colour denotes effluent type)
- Manhole (Colour denotes effluent type)
- Sewage Treatment Works
- Pumping Station

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love every drop anglianwater

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
0104	620041	326199	F	-	-	-
0201	620018	326233	F	-	-	-
0202	620033	326244	F	-	-	-
0203	620055	326242	F	-	-	-
0204	620074	326241	F	-	-	-
0205	620088	326219	F	-	-	-
0206	620027	326213	F	-	-	-
0207	620019	326285	F	-	-	-
0208	620046	326294	F	-	-	-
0301	620034	326320	F	-	-	-
0302	620055	326311	F	-	-	-
0601	620064	326698	F	16.19	14.93	1.26
0602	620098	326698	F	-	-	-
0702	620071	326784	F	-	-	-
1201	620106	326250	F	-	-	-
1202	620142	326231	F	-	-	-
1203	620151	326243	F	-	-	-
1204	620108	326268	F	-	-	-
1206	620199	326219	F	-	-	-
1207	620193	326209	F	-	-	-
1401	620177	326439	F	22.07	19.59	2.48
1501	620155	326530	F	20.46	18.79	1.67
1601	620135	326622	F	18.61	16.87	1.74
1602	620151	326693	F	15.68	14.42	1.26
1701	620111	326736	F	15.898	13.942	1.956
1702	620164	326731	F	15.9	13.93	1.97
2203	620206	326230	F	-	-	-
2204	620229	326279	F	-	-	-
2205	620233	326269	F	-	-	-
2206	620208	326217	F	-	-	-
2301	620204	326359	F	-	-	-
2701	620259	326731	F	15.52	13.76	1.76
3701	620363	326746	F	16.2	13.43	2.77
4701	620463	326792	F	16.2	13.08	3.12
5402	619547	326438	F	31.12	28.99	2.13
5403	619577	326441	F	29.812	24.689	5.123
5404	619539	326480	F	-	-	-
5502	619583	326561	F	-	-	-
5603	619594	326616	F	-	-	-
5605	619554	326620	F	-	-	-
6201	619659	326239	F	-	-	-
6202	619618	326234	F	-	-	-
6203	619615	326281	F	-	-	-
6301	619629	326321	F	-	-	-
6302	619660	326354	F	-	-	-
6401	619607	326413	F	-	-	-
6501	619686	326556	F	-	-	-
6502	619687	326593	F	-	-	-
6601	619640	326603	F	-	-	-
6602	619605	326644	F	-	-	-
6603	619623	326681	F	20.94	18.52	2.42
6604	619680	326672	F	20.4	18.38	2.02
6701	619611	326796	F	25.88	24.1	1.78
6702	619698	326783	F	24.53	22.66	1.87
6703	619625	326748	F	-	-	-
6704	619688	326726	F	-	-	-
7101	619743	326200	F	-	-	-
7201	619722	326246	F	-	-	-
7202	619751	326290	F	-	-	-
7301	619700	326322	F	-	-	-
7302	619783	326343	F	-	-	-
7303	619790	326385	F	-	-	-
7401	619736	326406	F	-	-	-
7402	619738	326431	F	-	-	-
7501	619752	326588	F	-	-	-
7502	619774	326524	F	-	-	-
7503	619788	326596	F	-	-	-
7504	619701	326559	F	-	-	-
7601	619756	326655	F	18.87	17	1.87
7701	619739	326771	F	23.19	21.29	1.9
7702	619794	326735	F	22.59	20.76	1.83
8201	619843	326244	F	-	-	-
8202	619834	326279	F	-	-	-
8203	619894	326293	F	-	-	-
8301	619860	326375	F	-	-	-
8302	619847	326307	F	-	-	-
8501	619834	326520	F	-	-	-
8502	619866	326515	F	-	-	-
8601	619814	326629	F	18.15	16.45	1.7
8602	619812	326638	F	-	-	-
8603	619831	326624	F	-	-	-
8604	619812	326693	F	-	-	-
8605	619869	326624	F	17.54	16.18	1.36
8701	619838	326711	F	21.57	19.18	2.39
8702	619835	326702	F	-	-	-
9102	619975	326177	F	-	-	-
9201	619923	326211	F	-	-	-
9202	619925	326244	F	-	-	-
9203	619969	326261	F	-	-	-
9204	619997	326225	F	-	-	-
9301	619943	326340	F	-	-	-
9302	619993	326323	F	-	-	-
9601	619910	326622	F	17.59	15.99	1.6
9602	619918	326604	F	17.67	15.92	1.75
9603	620003	326605	F	16.73	15.54	1.19
9604	620001	326679	F	17.07	15.29	1.78
9701	619901	326703	F	19.355	17.258	2.097
9702	619996	326703	F	17.48	15.859	1.621
0551	620051	326582	S	17.39	13.77	3.62
0751	620038	326704	S	-	-	-
1551	620110	326587	S	15.93	11.89	4.04
1552	620104	326593	S	13.1	11.9	1.2
1651	620167	326689	S	-	-	-
1652	620162	326631	S	13.86	11.59	2.27
1653	620174	326632	S	14.66	11.5	3.16
1654	620189	326642	S	14.22	11.34	2.88
2651	620201	326656	S	13.91	11.13	2.78
2652	620235	326656	S	12.69	11.13	1.56
2653	620242	326649	S	12.55	11.03	1.52
5551	619577	326560	S	-	-	-
5552	619549	326515	S	-	-	-
5652	619550	326625	S	-	-	-
5653	619591	326618	S	-	-	-
5654	619564	326663	S	-	-	-
5655	619585	326665	S	-	-	-
5656	619548	326619	S	-	-	-
5851	619559	326813	S	-	-	-
6551	619690	326556	S	-	-	-
6552	619690	326594	S	-	-	-
6553	619667	326522	S	-	-	-
6554	619626	326516	S	-	-	-
6651	619631	326607	S	-	-	-
6652	619681	326669	S	-	-	-
6653	619619	326679	S	-	-	-
6751	619689	326733	S	-	-	-
6752	619627	326755	S	-	-	-
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7552	619788	326597	S	-	-	-
7553	619745	326508	S	-	-	-
7554	619719	326518	S	-	-	-
7555	619702	326522	S	-	-	-
7651	619765	326649	S	18.87	16.51	2.36
7751	619782	326716	S	-	-	-
7752	619712	326781	S	-	-	-
7753	619779	326747	S	-	-	-
8451	619869	326482	S	22.51	19.66	2.85
8452	619818	326466	S	23.93	20.44	3.49
8551	619835	326528	S	-	-	-
8552	619870	326575	S	18.71	16.39	2.32
8553	619869	326530	S	20.79	18.19	2.6
8651	619814	326627	S	18.15	15.95	2.2
8652	619840	326623	S	17.71	15.85	1.86
8653	619817	326652	S	-	-	-
8654	619870	326623	S	18.88	-	3.08
8751	619816	326703	S	-	-	-
8752	619815	326728	S	-	-	-
8753	619884	326707	S	-	-	-
9551	619917	326601	S	17.67	-	-
9552	619960	326576	S	17.832	14.242	3.59
9553	620002	326602	S	-	-	-
9652	619907	326621	S	17.59	15.47	2.12
9751	619950	326704	S	-	-	-

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert