



GEMMA DESIGN

Pye Homes

Letchmere Green
Heyford Park
Upper Heyford

FOUL DRAINAGE
ASSESSMENT

April 2017

Gemma Design Ltd
Lea View House, Two Rivers Estate,
Station Lane, Witney,
Oxon, OX28 4LD
Tel: 01993 705 522
Fax: 01993 779 220
E-mail: info@gemma-design.co.uk
Website: www.gemma-design.co.uk

Report Reference: 3858-GDL-RP-C-01A

FOUL DRAINAGE ASSESSMENT

FOR

Letchmere Green, Heyford Park, Upper Heyford

Gemma Design Ltd have prepared this report in accordance with the instruction of Pye Homes Ltd ("The Client").

The foul drainage assessment is for the sole and specific use of the client and Gemma Design Ltd shall not be responsible for any use of the assessment or its contents for any purpose other than that for which it was prepared and provided. Should the client require to pass copies of the assessment to other parties for information, then no professional liability or warranty shall be extended to other parties by Gemma Design Ltd in this connection without the explicit agreement thereto by Gemma Design Ltd.

Prepared by:	Mateo Blanco MEng		Date:	19/04/17
Checked by:	S Watts BEng (Hons)		Date:	19/04/17
Approved by:	S Watts BEng (Hons)		Date:	19/04/17

Issue

Date	Sheet No	Sets	Recipient
15/07/2015	Draft		Stuart Wright – Pye Homes & Hannah Smart – West Waddy
20/07/2015	Formal issue		Stuart Wright – Pye Homes Hannah Smart – West Waddy Rebecca Barnett – West Waddy
19/04/17	Revision A		Stuart Wright – Pye Homes Hannah Smart – West Waddy

Amendments

Date	Sheet No	Sets	Recipient
19/04/17	Revision A		Stuart Wright – Pye Homes Hannah Smart – West Waddy

Contents

1	List of Appendices	3
2	Summary	4
3	Introduction	5
4	The Site	5
5	Proposed Development	6
6	Foul Drainage Strategy	6
7	Conclusion	7
8	References	8
9	Appendices	9

1 List of Appendices

Appendix A – Topographical Site Survey

Appendix B – Thames Water’s Drainage Records

Appendix C – Proposed Development Layout (West Waddy ADP Drg Nr P01)

Appendix D – Preliminary Foul Treatment Plant Details

Appendix E – Thames Water Sewer Requisition Enquiry

Appendix F – Foul Water Drainage Strategy Plan (Drawing 3858-GDL-XX-D-DR-C-002)

2 Summary

- 2.1 Gemma Design Limited have been commissioned, on behalf of Pye Homes, to undertake a foul drainage assessment in support of a detailed planning application for a proposed residential development on the land adjacent to former military base in Upper Heyford.
- 2.2 The development will comprise of 77 dwellings and will be located on a greenfield site.
- 2.3 This report sets out the proposals for managing the foul flows from the development and has been prepared in order to address the planning authorities' requirements.
- 2.4 As there are no foul sewers in the vicinity of the site and the cost of requisitioning Thames Water to provide a connection to serve the development is prohibitive (in the order of £2.5 million), it is proposed to provide a treatment plant on the development. The treatment plant will be located towards the south-east corner (the lowest part) of the development and will discharge in to the watercourse (subject to an Environmental Permit from the Environment Agency) located along the easterly site boundary.

3 Introduction

- 3.1 This foul drainage assessment has been prepared by Gemma Design Ltd on behalf of Pye Homes Ltd in support of a planning application for a residential development on a greenfield site immediately east of the former military base in Upper Heyford.
- 3.2 This assessment sets out the proposals for managing foul flows from the development and has been prepared in order to address the requirements of the planning authority, Cherwell District Council.

4 The Site

- 4.1 This greenfield site, which is currently an arable field, is located immediately east of the former military base and is accessed from Camp Road from the south.
- 4.2 There is a single track tarmac road along the westerly site boundary that serves Letchmere Farm to the north of the site and beyond the track are a number of residential properties that form part of the former RAF base. Along the easterly site boundary there is a watercourse and beyond this there are arable fields. Camp Road forms the southern site boundary with the Heyford Leys Camping Park beyond.
- 4.3 The Ordnance Survey National Grid reference for the centre of the site is 451900mE, 225850mN.
- 4.4 The site is irregular in shape and varies in width (east to west) from 115m at the front (southern part) of the site to 174m towards the rear (northern part) of the site. The overall length (north to south) of the site is approximately 220m. There is a gentle fall across the site in a south-easterly direction. The north-west corner is the highest part of the site and is approximately 120.15m above Ordnance Survey (OS) datum. The south-east corner is the lowest part of the site and this is approximately 115.20m above OS datum. The site covers an area of approximately 3.3 hectares.
- 4.5 A topographical site survey, undertaken by Interlock Surveys Limited to Ordnance Survey datum, is enclosed in Appendix A.
- 4.6 The drainage records provided by Thames Water indicate that there are no public sewers in the vicinity of the site. All of the existing drainage shown on the record drawings are sewers not operated or maintained by Thames Water. It is understood that these private sewers drain to a private sewerage treatment works on the former military base. A copy of record plans provided by Thames Water are enclosed in Appendix B.

5 Proposed Development

- 5.1 This 77 unit development will be accessed from Camp Road to the south and will comprise of the following properties:

1 Bedroom Flat	10
2 Bedroom House	23
3 Bedroom House	32
4 Bedroom House	12

- 5.2 The development will be served by an access road, which will be offered for adoption, along the central part of the site. It is estimated that the proposed buildings and paved areas on the development will cover an area of approximately 12,200m². Approximately 3600m² of public open space will be provided in the central part of the site.
- 5.3 Drawing Nr P01, prepared by Westwaddy ADP, which shows the layout of the proposed development is enclosed in Appendix C.

6 Foul Drainage Strategy

- 6.1 As there are no public foul sewers within the vicinity of the site (The closest foul sewer is located approximately 2km to the west of the development), it is proposed to drain the development to a sewerage treatment plant located towards the south-east corner (the lowest part) of the development. Preliminary details of the sewerage treatment plant are enclosed in Appendix D and will include a vehicle hardstanding for maintenance purposes.
- 6.2 A requisition application was submitted to Thames Water, however, Thames Water have advised that due to capacity issues in the existing network the development would have to drain directly to the sewerage treatment plant located to the south of Upper Heyford and approximately 3km west of the development. The proposals include 1.4km of 150mm diameter gravity sewer and 1.6km of 125mm SDR11 rising main and Thames Water estimate that the works would cost in the order of £2.8 million. A copy of Thames Water's correspondence is enclosed in Appendix E. As the cost and practicalities of providing a connection to the sewerage treatment works is likely to be prohibitive for the size of the development, it is therefore proposed to use a proprietary treatment plant to manage the foul water flows from the development. The flows for the development will drain to the treatment plant via a gravity drainage system and the plant will discharge the treated effluent in to the adjacent watercourse. The proposed outfall in to the water course will be subject to an environment permit from the Environment Agency. It is estimated that the flow rate from the site will be in the order of 42,000l/day using the methodology set out in British Water's Flows and Loads. This equates to a flow rate of approximately 1l/s over a 12 hour period.

- 6.3 A plan showing the foul drainage strategy (Drawing 3858-GDL-XX-D-DR-C-002), including the location of the foul treatment plant, is enclosed in Appendix F.
- 6.4 As the foul drainage system on the development will remain in private ownership a management company will be put in place in order to maintain the system, including the treatment plant, in perpetuity. The treatment plant will be maintained in accordance with the manufacturer's guidelines.

7 Conclusion

- 7.1 This foul drainage assessment has been prepared on behalf of Pye Homes to support a planning application for 77 units on an arable field immediately east of the former RAF base in Upper Heyford.
- 7.2 As there are no public foul sewers in the vicinity of the site (The closest foul sewer is located approximately 2km to the east of the development) it is proposed to drain the development, via a foul gravity network, to a foul treatment plant located in the south-east corner (the lowest part) of the development. It is proposed to discharge the treatment plant in to the adjacent watercourse, which will be subject to an environmental permit from the Environment Agency.
- 7.3 Consideration was given to an off-site connection through a requisition application to Thames Water. However, Thames Water have advised that a direct connection to the existing sewerage treatment plant, located some 3km west of the development, would be required, due to capacity constraints in the existing network and they estimate that these works would cost in the order of £2.8 million. As the cost and practicalities of providing a connection to the Sewerage treatment plant is prohibitive an on site treatment system is therefore proposed.
- 7.4 As the foul drainage system will remain in private ownership a management company will be established to maintain the drainage system, including the treatment plant, in perpetuity.

8 References

British Water's Code of Practice, Flows & Loads – 4 (Sizing Criteria, Treatment Capacity for Sewerage Treatment Systems)

9 Appendices

Appendix A – Topographical Site Survey

Appendix B – Thames Water’s Drainage Records

Appendix C – Proposed Development Layout (West Waddy ADP Dr Nr P01)

Appendix D – Preliminary Foul Treatment Plant Details

Appendix E – Thames Water Sewer Requisition Enquiry

Appendix F – Foul Water Drainage Strategy Plan (Drawing 3858-GDL-XX-D-DR-C-002)

Appendix A – Topographical Site Survey

TREE SCHEDULE

No	Species	Dia	Height
1	unknown	0.150	4m
2	unknown	0.250	5m
3	oak	0.700	10m
4	willow	0.700	10m
5	oak	0.300	4m
6	ash	Multi	11m
7	ash	0.300	11m
8	sycamore	0.300	11m
9	sycamore	0.300	11m
10	ash	0.300	12m
11	cherry	0.150	4m
12	sycamore	0.300	4m
13	sycamore	Multi	4m
14	sycamore	0.250	11m
15	sycamore	0.300	12m
16	ash	0.300	12m
17	sycamore	0.300	4m
18	sycamore	0.300	9m
19	sycamore	0.300	9m
20	sycamore	0.300	10m
21	sycamore	0.300	9m
22	sycamore	0.300	9m
23	sycamore	0.300	10m
24	black thorn	0.300	5m
25	sycamore	Multi	9m

Symbol & Abbreviation Key

	BARBED WIRE FENCE
	POST & RAIL FENCE
	CLOSE BOARD FENCE
	RAILINGS
	CHAIN LINK FENCE
	OTHER FENCE
	KERB
	DROPPED KERB
	GULLY CHANNEL
	TOP OF BANK
	FOLIAGE
	DITCH
	VERGE
	OVERHEAD CABLES
	GATE
	HEDGE
	TREE - BROAD LEAVED
	TREE - CONIFEROUS
	BUSH
	BUILDING
	BOREHOLE
	SURVEY STATION
	ORDNANCE SURVEY BENCH MARK

AC	AIR CONDITIONING UNIT	KO	KERB OFFLET
AV	AIR VALVE	LC	LIGHTING COLUMN
BCL	BOLLARD	LP	LAMP POST
BH	BOREHOLE	NP	NAME PLATE
BL	BE LEVEL	NB	NOTICE BOARD
BM	BENCH MARK	PP	PIPE RISER
BT	BRITISH TELECOM	RP	ROOFING POINT
CTV	CABLE TV	RJ	ROAD SIGN
CL	COVER LEVEL	SP	SIGN POST
CR	CABLE RISER	SV	STOP VALVE
CP	DOWN PIPE	TL	TRAFFIC LIGHT
ER	EARTH ROD	TP	TELEGRAPH POLE
EP	ELECTRICITY HOLE	TOP	TOP OF FENCE
EM	ELECTRICITY MARKER	TOH	TOP OF HEDGE
FS	FUSE BOX	TOR	TOP OF RAILINGS
PH	FIRE HYDRANT	TOS	TOP OF SERVICE LEVELS
FP	FENCE POST	TOW	TOP OF WALL
FL	FLOOR LEVEL	UTL	UNABLE TO LIFT
GV	GAS VALVE	VM	VALVE MARKER
GM	GAS MARKER	VP	VENT PIPE
GU	GULLY	WL	WATER LEVEL
HM	HYDRANT MARKER	WM	WATER MARKER
L	INVERT LEVEL	WO	WASH OUT

General.
 This survey has been prepared with a scaling accuracy for a plot of a scale of 1:200.
 All tree heights and spreads are approximate. We have tried to identify tree types, however if tree species are critical specialist advice should be gained.
 Drainage pipe sizes have been measured from the surface. Chamber access has not been gained for safety reasons, therefore sizes should be regarded as approximate.
 Some detail may have been omitted due to parked vehicles.

Notes.
 Coordinates related to OS National Grid from ST02 by GPS (No scale factor added). Levels related to GPs.



Rev	Details of Revision	Drawn	Date

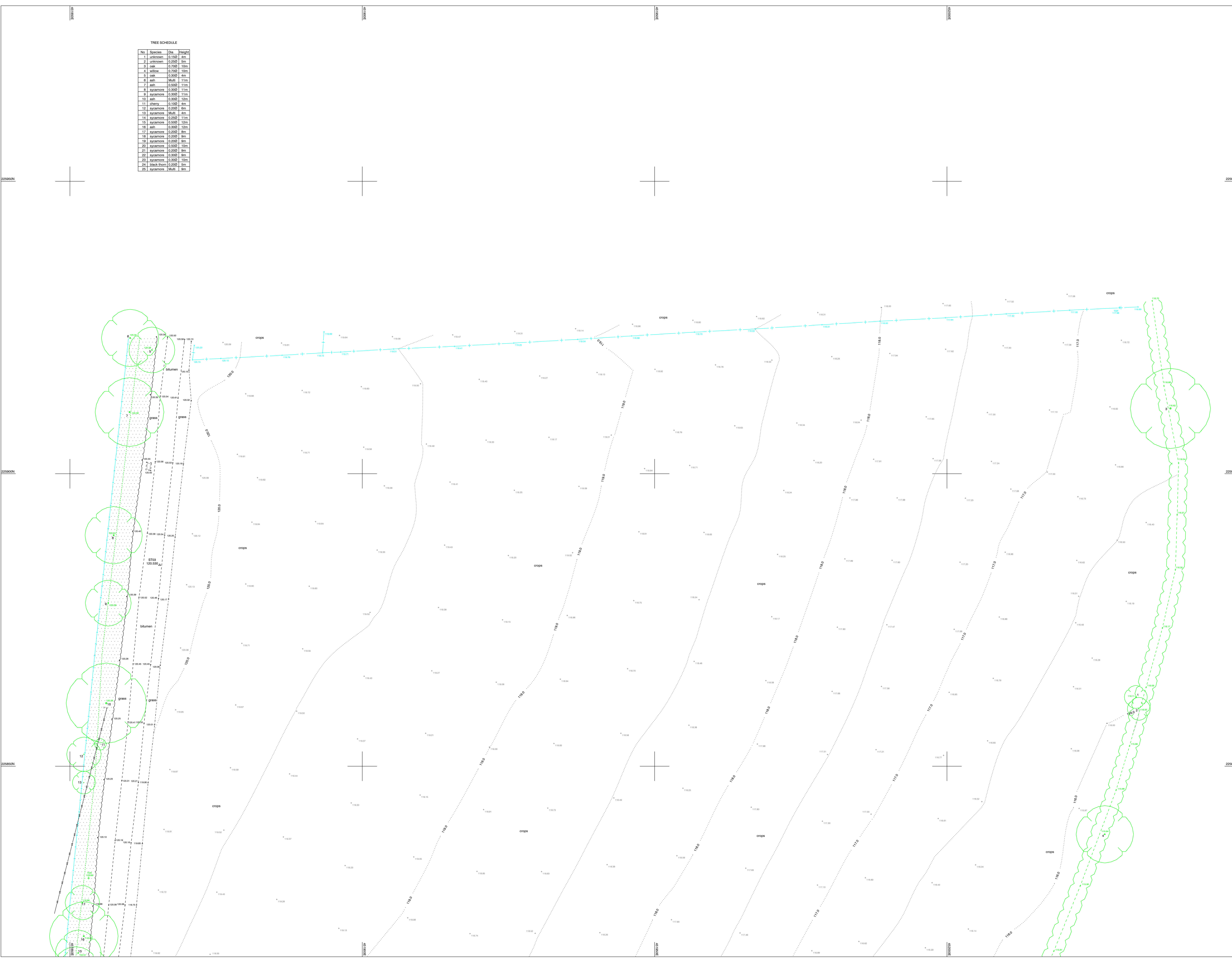
Surveyed	Drawn	Date	Checked	Date	Approved	Date
SI	RW	15/09/14	ELG	17/09/14	RGJ	17/09/14

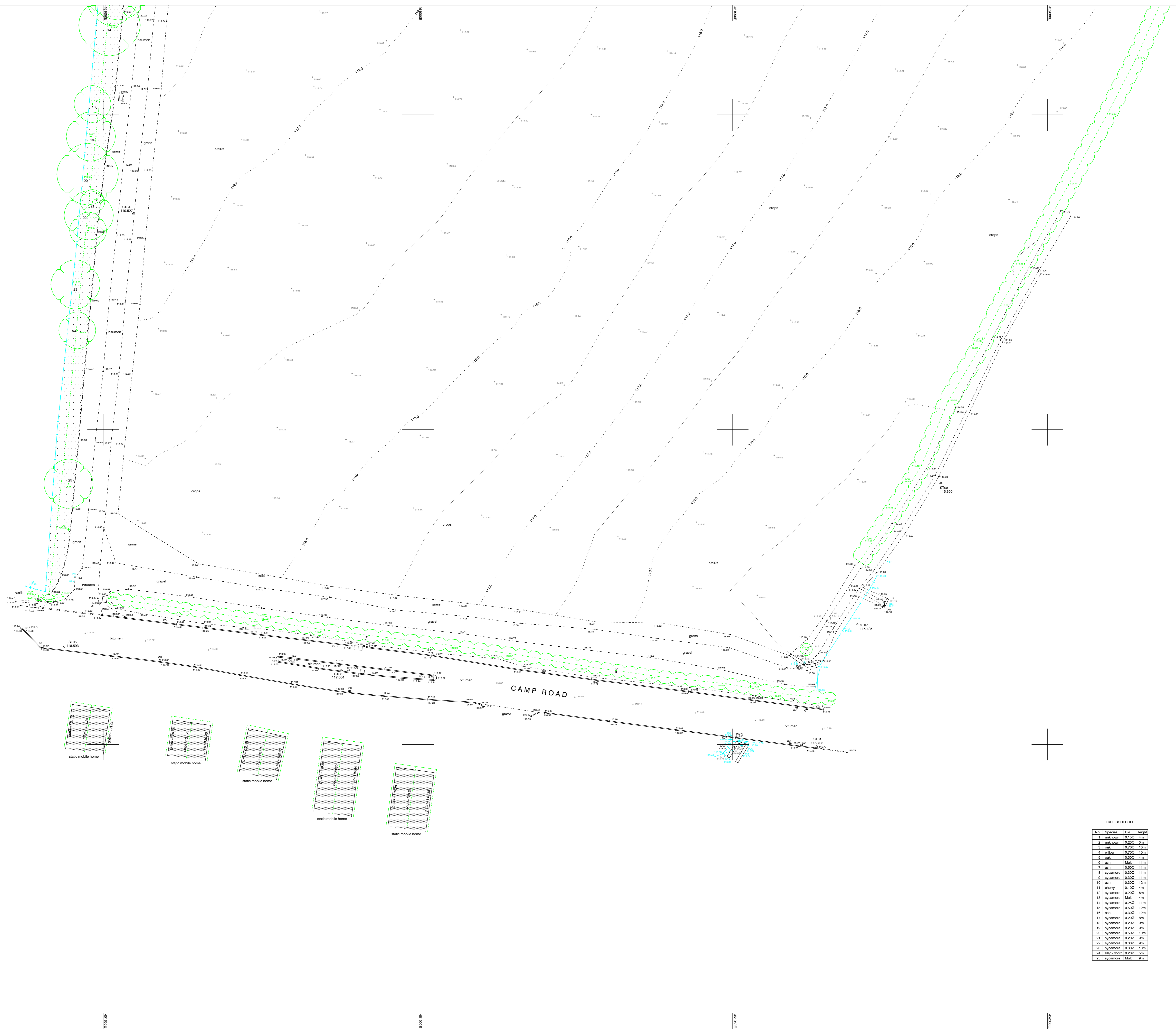
INTERLOCK SURVEYS
 Interlock Surveys Limited
 St. Andrews House
 Radford Grange
 Leamington Spa
 Warwickshire
 CV31 1TF
 T: 01926 330123
 F: 01926 330120
 E: info@interlocksurveys.co.uk

Client.
 PYE HOMES GROUP
 LANGFORD LOCKS
 KILINGTON OXON
 OX5 1HZ

Title.
TOPOGRAPHICAL SURVEY
 CAMP ROAD
 UPPER HEYFORD
 OX25 5LX

Dwg No. 140720 Sheet **1 of 2**
 Scale 1:200 A0 Sheet Rev. -





Symbol & Abbreviation Key

BARBED WIRE FENCE	BARBED WIRE FENCE
POST & RAIL FENCE	POST & RAIL FENCE
CLOSE BOARD FENCE	CLOSE BOARD FENCE
RAILINGS	RAILINGS
CHAIN LINK FENCE	CHAIN LINK FENCE
OTHER FENCE	OTHER FENCE
KERB	KERB
DROPPED KERB	DROPPED KERB
GULLY CHANNEL	GULLY CHANNEL
TOP / BOTTOM OF BANK	TOP / BOTTOM OF BANK
FOLIAGE	FOLIAGE
DITCH	DITCH
VERGE	VERGE
OVERHEAD CABLES	OVERHEAD CABLES
GATE	GATE
HEDGE	HEDGE
TREE - BROAD LEAVED	TREE - BROAD LEAVED
TREE - CONIFEROUS	TREE - CONIFEROUS
BUSH	BUSH
BUILDING	BUILDING
BOREHOLE	BOREHOLE
SURVEY STATION	SURVEY STATION
ORDNANCE SURVEY BENCH MARK	ORDNANCE SURVEY BENCH MARK

AC	AIR CONDITIONING UNIT	KO	KERB OFFSET
AV	AIR VALVE	LC	LIGHTING COLUMN
BCL	BOLLARD	LP	LAMP POST
BH	BOREHOLE	NP	NAME PLATE
BL	BED LEVEL	NB	NOTICE BOARD
BM	BENCH MARK	PN	PIPE RISER
BT	BRITISH TELECOM	RP	ROOFING POINT
CTV	CABLE TV	RS	ROAD SIGN
CL	COVER LEVEL	SP	SIGN POST
CR	CABLE RISER	SV	STOP VALVE
CP	DOWN PIPE	TL	TRAFFIC LIGHT
ER	EARTH ROD	TP	TELEGRAPH POLE
EP	ELECTRICITY POLE	TOP	TOP OF FENCE
EM	ELECTRICITY MARKER	TOS	TOP OF SERVICE LEVEL
FB	FUSE BOX	TOR	TOP OF RAILINGS
PH	FIRE HYDRANT	TSL	TOP OF WALL
FP	FENCE POST	TDM	TOP OF DRAIN
FL	FLOOR LEVEL	UTL	UTILITY TO LEFT
GV	GAS VALVE	VM	VALVE MARKER
GM	GAS MARKER	VP	VENT PIPE
GU	GULLY	WL	WATER LEVEL
HM	HYDRANT MARKER	WM	WATER MARKER
IL	INVERT LEVEL	WO	WASH OUT

General.
 This survey has been prepared with a scaling accuracy for a plot of a scale of 1:200.
 All tree heights and spreads are approximate. We have tried to identify tree types, however if tree species are critical specialist advice should be gained.
 Drainage pipe sizes have been measured from the surface. Chamber access has not been gained for safety reasons, therefore sizes should be regarded as approximate.
 Some detail may have been omitted due to parked vehicles.

Notes.
 Coordinates related to OS National Grid from ST02 by GPS (No scale factor added).
 Levels related to GPs.



Rev	Details of Revision	Drawn	Date

Survived	Drawn	Date	Checked	Date	Approved	Date

INTERLOCK SURVEYS

Interlock Surveys Limited
 St. Andrews House
 Radford Grange
 Leamington Spa
 Warwickshire
 CV31 1TF

T: 01926 330123
 F: 01926 330120
 E: info@interlocksurveys.co.uk

Client.
 PYE HOMES GROUP
 LANGFORD LOCKS
 KILINGTON OXON
 OX5 1HZ

Title.
TOPOGRAPHICAL SURVEY
 CAMP ROAD
 UPPER HEYFORD
 OX25 5LX

Dwg No. **140720** Sheet **2 of 2**
 Scale 1:200 A0 Sheet Rev. -

TREE SCHEDULE

No	Species	Da	Height
1	unknown	0.150	4m
2	unknown	0.250	5m
3	oak	0.700	10m
4	willow	0.100	10m
5	oak	0.200	4m
6	ash	Multi	11m
7	ash	0.200	11m
8	acornmore	0.300	11m
9	acornmore	0.300	11m
10	ash	0.200	12m
11	cherry	0.100	4m
12	acornmore	0.200	4m
13	acornmore	Multi	4m
14	acornmore	0.200	11m
15	acornmore	0.200	12m
16	ash	0.300	12m
17	acornmore	0.200	8m
18	acornmore	0.200	8m
19	acornmore	0.200	8m
20	acornmore	0.200	10m
21	acornmore	0.200	8m
22	acornmore	0.300	8m
23	acornmore	0.200	10m
24	black thorn	0.200	5m
25	acornmore	Multi	8m

Appendix B – Thames Water’s Drainage Records

Asset Location Search



J A Pye (Oxford) Ltd
OXFORD
OX5 1HZ

Search address supplied Land at Letchmere Farm
Camp Road
Larsen Road
Upper Heyford
Bicester
Oxfordshire

Your reference Camp Road Upper Heyford

Our reference ALS/ALS Standard/2014_2883778

Search date 21 January 2015

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: Land at Letchmere Farm, Camp Road, Larsen Road, Upper Heyford, Bicester, Oxfordshire,

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:

SP5125NW
SP5126SW
SP5125NE
SP5126SE

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:

Asset Location Search



SP5125NW
SP5125NE

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.

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

SP5126SW
SP5126SE

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

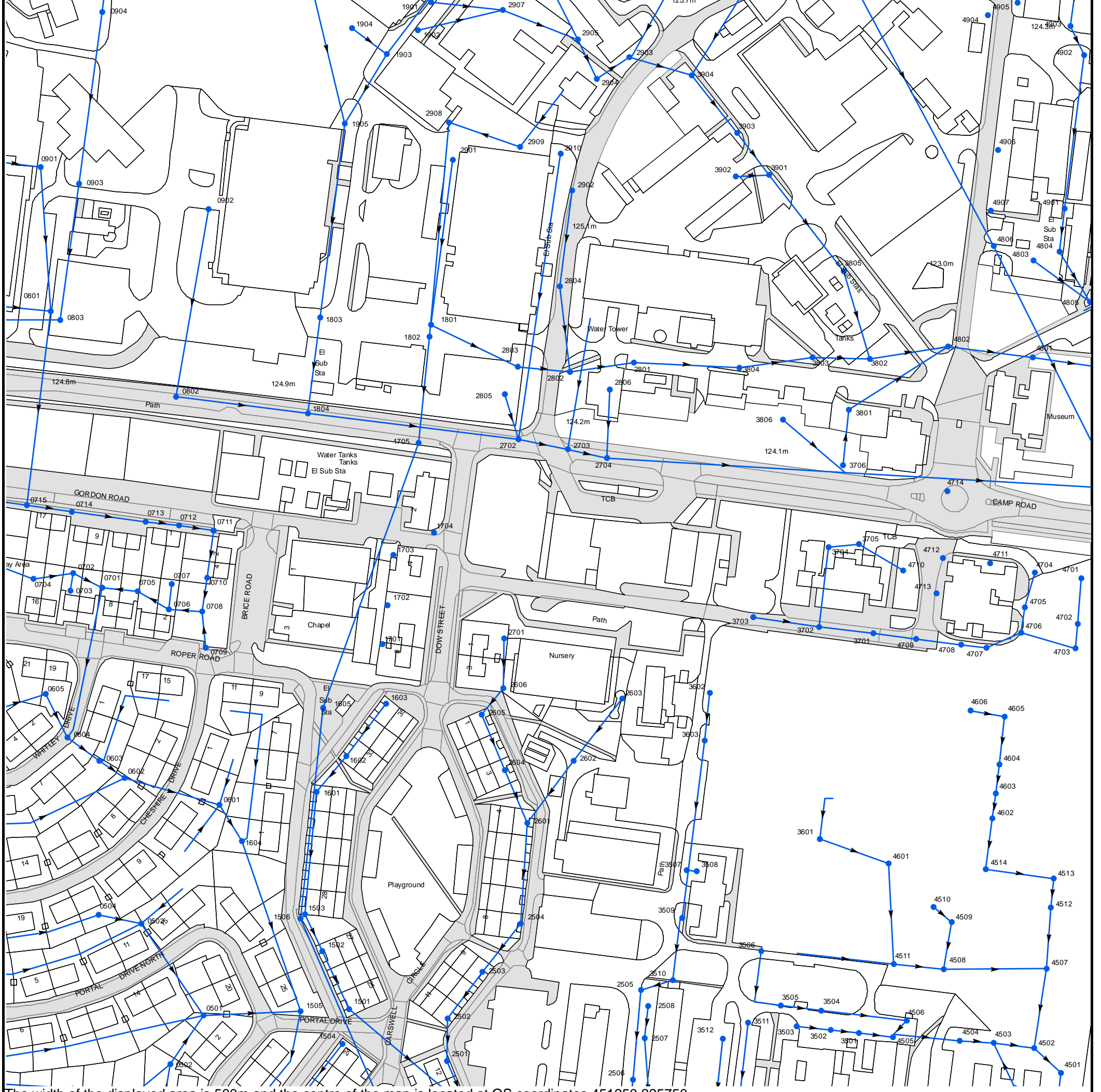
Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

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 451250,225750
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.

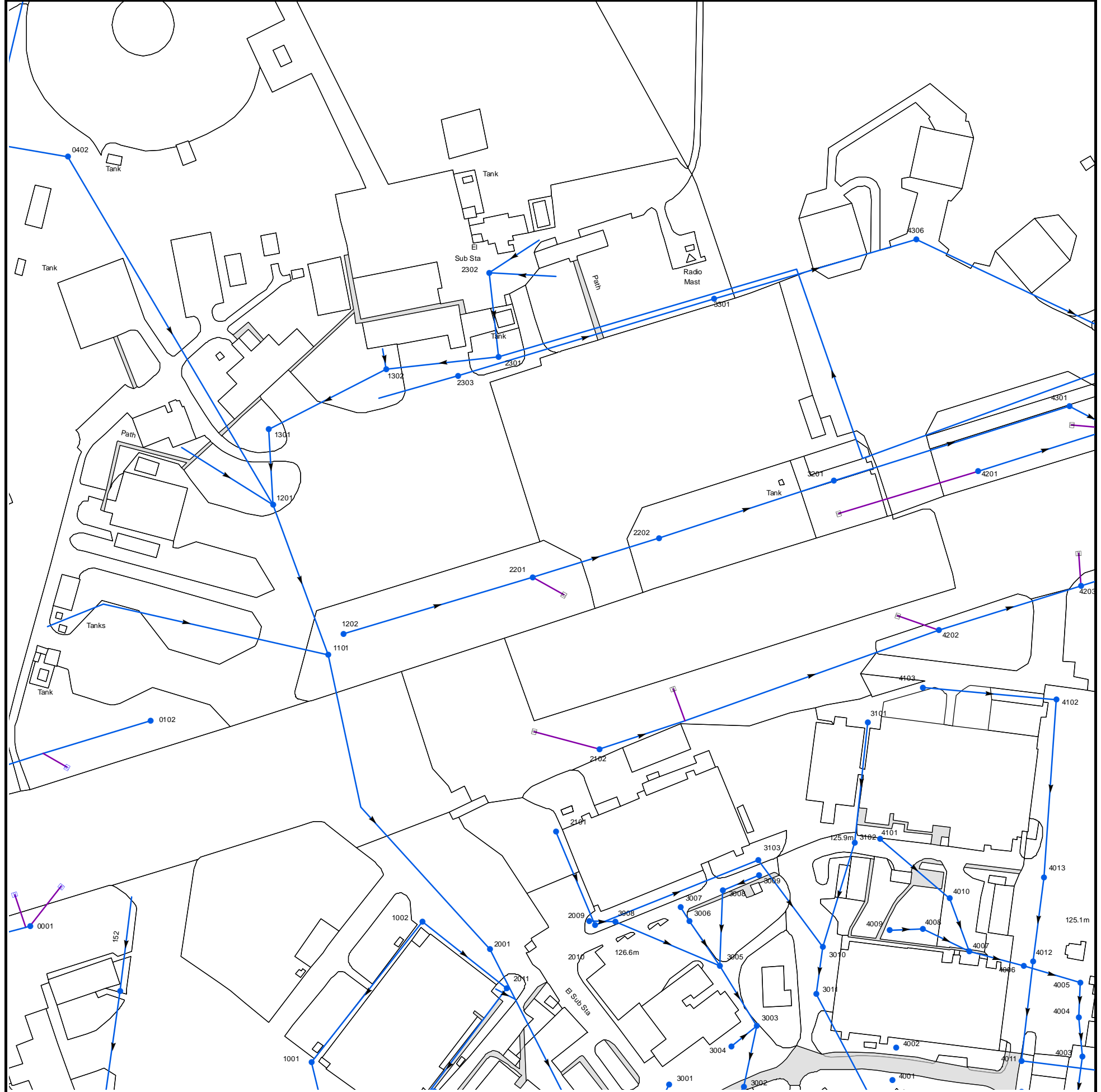
Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

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
4907	n/a	n/a
4901	n/a	n/a
3901	n/a	n/a
4906	n/a	n/a
4902	n/a	n/a
4903	n/a	n/a
4904	n/a	n/a
4905	n/a	n/a
1801	n/a	n/a
2908	n/a	n/a
2901	n/a	n/a
2907	n/a	n/a
2805	n/a	n/a
2803	n/a	n/a
2702	n/a	n/a
2909	n/a	n/a
2704	n/a	n/a
2703	n/a	n/a
2806	n/a	n/a
2802	n/a	n/a
3804	n/a	n/a
2801	n/a	n/a
2804	n/a	n/a
2902	n/a	n/a
3902	n/a	n/a
2910	n/a	n/a
3903	n/a	n/a
2904	n/a	n/a
3904	n/a	n/a
2903	n/a	n/a
2905	n/a	n/a
4704	n/a	n/a
4804	n/a	n/a
4703	n/a	n/a
4702	n/a	n/a
4701	n/a	n/a
4805	n/a	n/a
3703	n/a	n/a
3806	n/a	n/a
3803	n/a	n/a
3702	n/a	n/a
3704	n/a	n/a
3706	n/a	n/a
3805	n/a	n/a
3801	n/a	n/a
3705	n/a	n/a
3802	n/a	n/a
3701	n/a	n/a
4710	n/a	n/a
4709	n/a	n/a
4713	n/a	n/a
4712	n/a	n/a
4714	n/a	n/a
4802	n/a	n/a
4708	n/a	n/a
4606	n/a	n/a
4707	n/a	n/a
4711	n/a	n/a
4806	n/a	n/a
4605	n/a	n/a
4706	n/a	n/a
4705	n/a	n/a
4801	n/a	n/a
4803	n/a	n/a
3603	n/a	n/a
0604	n/a	n/a
2605	n/a	n/a
1605	n/a	n/a
1603	n/a	n/a
2603	n/a	n/a
0605	n/a	n/a
3602	n/a	n/a
2606	n/a	n/a
0709	n/a	n/a
1701	n/a	n/a
2701	n/a	n/a
0708	n/a	n/a
0706	n/a	n/a
1702	n/a	n/a
0705	n/a	n/a
0703	n/a	n/a
0701	n/a	n/a
0707	n/a	n/a
0704	n/a	n/a
0710	n/a	n/a
0702	n/a	n/a
1703	n/a	n/a
1704	n/a	n/a
0711	n/a	n/a
2506	n/a	n/a
2501	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1504	n/a	n/a
2507	n/a	n/a
2502	n/a	n/a
1501	n/a	n/a
2508	n/a	n/a
2505	n/a	n/a
3510	n/a	n/a
2503	n/a	n/a
1502	n/a	n/a
2504	n/a	n/a
2601	n/a	n/a
1601	n/a	n/a
2604	n/a	n/a
2602	n/a	n/a
1602	n/a	n/a
4601	n/a	n/a
4505	n/a	n/a
4511	n/a	n/a
4506	n/a	n/a
4510	n/a	n/a
4508	n/a	n/a
4509	n/a	n/a
4504	n/a	n/a
4514	n/a	n/a
4602	n/a	n/a
4503	n/a	n/a
4603	n/a	n/a
4604	n/a	n/a
4502	n/a	n/a
4507	n/a	n/a
4512	n/a	n/a
4513	n/a	n/a
4501	n/a	n/a
3509	n/a	n/a
3507	n/a	n/a
3508	n/a	n/a
3512	n/a	n/a
3511	n/a	n/a
3506	n/a	n/a
3505	n/a	n/a
3503	n/a	n/a
3601	n/a	n/a
3504	n/a	n/a
3502	n/a	n/a
3501	n/a	n/a
0715	n/a	n/a
0901	n/a	n/a
0801	n/a	n/a
0803	n/a	n/a
0714	n/a	n/a
0903	n/a	n/a
0904	n/a	n/a
0713	n/a	n/a
0802	n/a	n/a
0712	n/a	n/a
0902	n/a	n/a
1804	n/a	n/a
1803	n/a	n/a
1905	n/a	n/a
1904	n/a	n/a
1903	n/a	n/a
1902	n/a	n/a
1705	n/a	n/a
1802	n/a	n/a
1901	n/a	n/a
0504	n/a	n/a
0603	n/a	n/a
0602	n/a	n/a
0503	n/a	n/a
0502	n/a	n/a
0501	n/a	n/a
0601	n/a	n/a
1604	n/a	n/a
1506	n/a	n/a
1505	n/a	n/a
1503	n/a	n/a

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



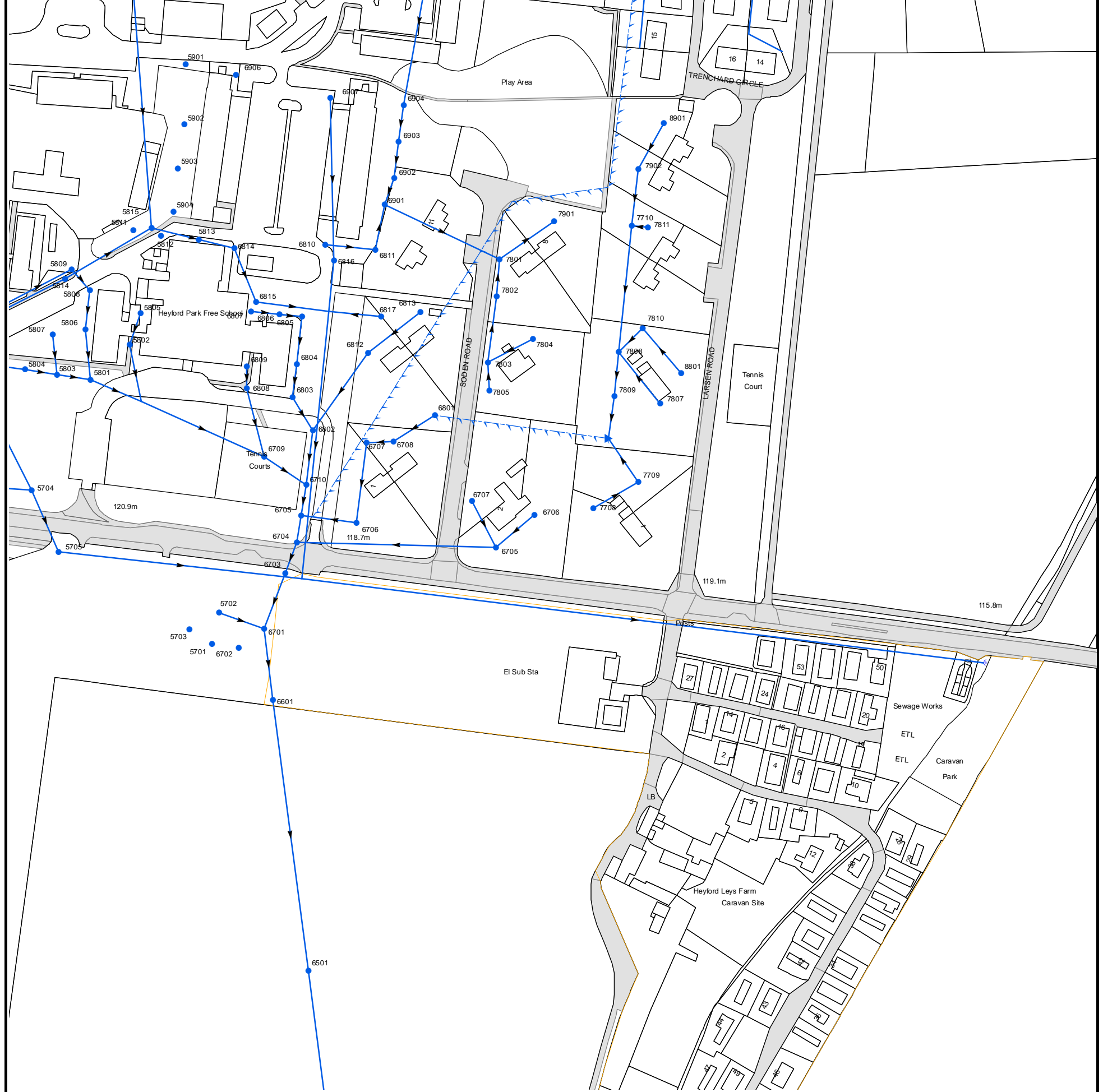
The width of the displayed area is 500m and the centre of the map is located at OS coordinates 451250,226250
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. 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
0402	n/a	n/a
1301	n/a	n/a
1201	n/a	n/a
1101	n/a	n/a
1202	n/a	n/a
1302	n/a	n/a
2303	n/a	n/a
2302	n/a	n/a
2301	n/a	n/a
2201	n/a	n/a
2202	n/a	n/a
3301	n/a	n/a
3201	n/a	n/a
4306	n/a	n/a
4103	n/a	n/a
4202	n/a	n/a
4201	n/a	n/a
4102	n/a	n/a
4301	n/a	n/a
4203	n/a	n/a
3005	n/a	n/a
4012	n/a	n/a
4007	n/a	n/a
2001	n/a	n/a
3010	n/a	n/a
4009	n/a	n/a
4008	n/a	n/a
0001	n/a	n/a
2010	n/a	n/a
3908	n/a	n/a
1002	n/a	n/a
2009	n/a	n/a
3006	n/a	n/a
3007	n/a	n/a
4010	n/a	n/a
3008	n/a	n/a
4013	n/a	n/a
3009	n/a	n/a
3103	n/a	n/a
3102	n/a	n/a
4101	n/a	n/a
2101	n/a	n/a
2102	n/a	n/a
3101	n/a	n/a
0102	n/a	n/a
4001	n/a	n/a
4011	n/a	n/a
4003	n/a	n/a
4002	n/a	n/a
3003	n/a	n/a
4004	n/a	n/a
3011	n/a	n/a
4005	n/a	n/a
4006	n/a	n/a
2011	n/a	n/a
3002	n/a	n/a
3001	n/a	n/a
3004	n/a	n/a
0003	n/a	n/a
1001	n/a	n/a

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



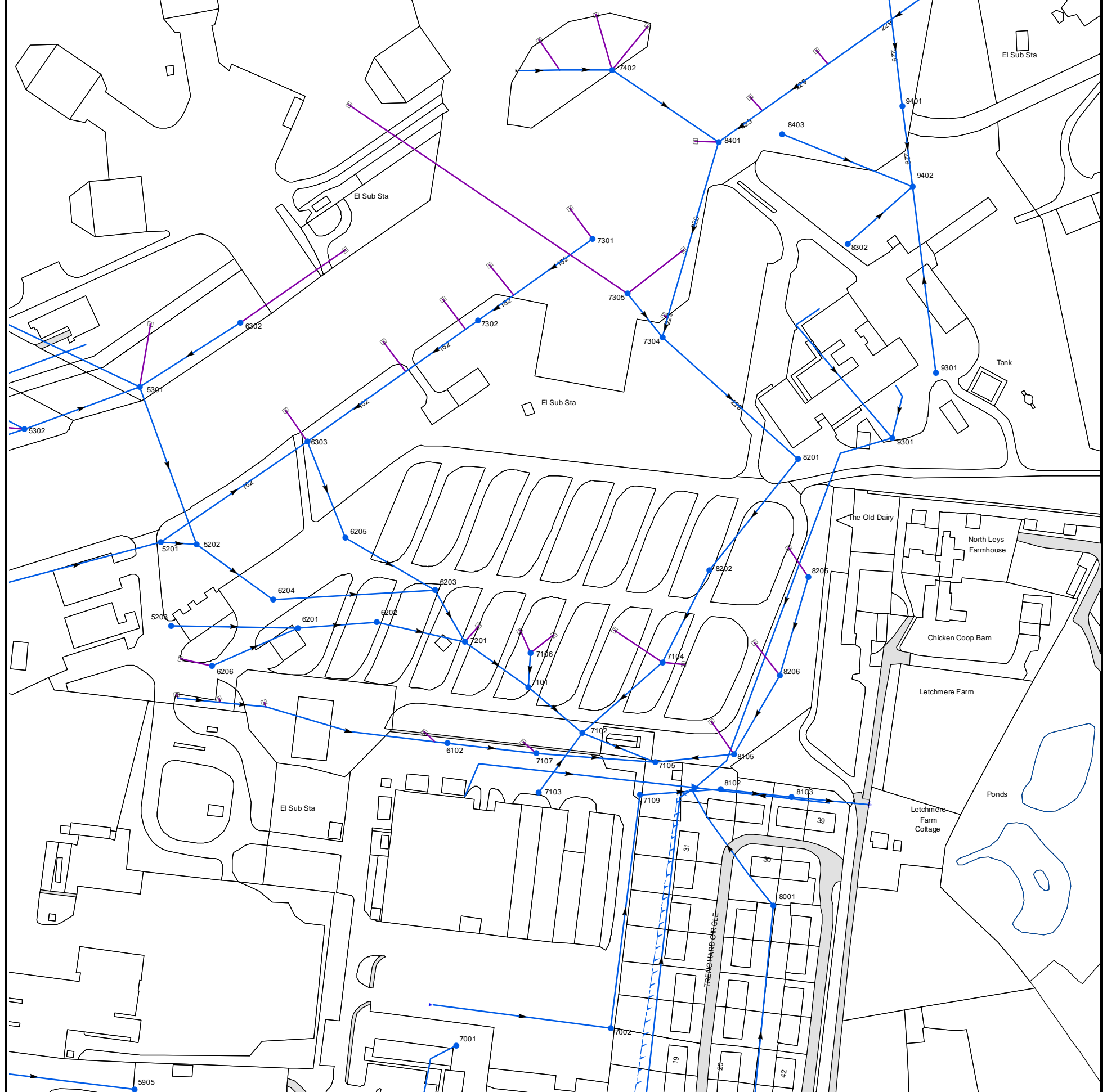
The width of the displayed area is 500m and the centre of the map is located at OS coordinates 451750,225750
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. 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
5813	n/a	n/a
5812	n/a	n/a
5811	n/a	n/a
5815	n/a	n/a
5904	n/a	n/a
5903	n/a	n/a
5902	n/a	n/a
6906	n/a	n/a
5901	n/a	n/a
6705	n/a	n/a
6706	n/a	n/a
7708	n/a	n/a
6707	n/a	n/a
7709	n/a	n/a
7807	n/a	n/a
7809	n/a	n/a
7805	n/a	n/a
8801	n/a	n/a
7803	n/a	n/a
7808	n/a	n/a
7804	n/a	n/a
7810	n/a	n/a
7802	n/a	n/a
7801	n/a	n/a
7811	n/a	n/a
7710	n/a	n/a
7901	n/a	n/a
7902	n/a	n/a
8901	n/a	n/a
5804	n/a	n/a
5704	n/a	n/a
5807	n/a	n/a
5803	n/a	n/a
5705	n/a	n/a
5814	n/a	n/a
5809	n/a	n/a
5806	n/a	n/a
5808	n/a	n/a
5801	n/a	n/a
5802	n/a	n/a
5805	n/a	n/a
5703	n/a	n/a
5701	n/a	n/a
5702	n/a	n/a
6814	n/a	n/a
6702	n/a	n/a
6809	n/a	n/a
6808	n/a	n/a
6807	n/a	n/a
6815	n/a	n/a
6709	n/a	n/a
6701	n/a	n/a
6601	n/a	n/a
6806	n/a	n/a
6703	n/a	n/a
6803	n/a	n/a
6804	n/a	n/a
6704	n/a	n/a
6705	n/a	n/a
6805	n/a	n/a
6710	n/a	n/a
6802	n/a	n/a
6810	n/a	n/a
6907	n/a	n/a
6816	n/a	n/a
6706	n/a	n/a
6707	n/a	n/a
6812	n/a	n/a
6811	n/a	n/a
6817	n/a	n/a
6901	n/a	n/a
6708	n/a	n/a
6902	n/a	n/a
6903	n/a	n/a
6904	n/a	n/a
6813	n/a	n/a
6801	n/a	n/a
6501	n/a	n/a

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



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 451750,226250
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
7402	n/a	n/a
5302	n/a	n/a
5301	n/a	n/a
5201	n/a	n/a
5203	n/a	n/a
5202	n/a	n/a
6206	n/a	n/a
6302	n/a	n/a
6204	n/a	n/a
6201	n/a	n/a
6303	n/a	n/a
6205	n/a	n/a
6202	n/a	n/a
6203	n/a	n/a
7105	n/a	n/a
8105	n/a	n/a
7107	n/a	n/a
6102	n/a	n/a
7102	n/a	n/a
7101	n/a	n/a
8206	n/a	n/a
7104	n/a	n/a
7106	n/a	n/a
7201	n/a	n/a
8205	n/a	n/a
8202	n/a	n/a
8201	n/a	n/a
9301	n/a	n/a
9301	n/a	n/a
7304	n/a	n/a
7302	n/a	n/a
7305	n/a	n/a
8302	n/a	n/a
7301	n/a	n/a
9402	n/a	n/a
8401	n/a	n/a
8403	n/a	n/a
9401	n/a	n/a
5905	n/a	n/a
7001	n/a	n/a
7002	n/a	n/a
8001	n/a	n/a
8103	n/a	n/a
7109	n/a	n/a
7103	n/a	n/a
8102	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
-  Gully
-  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 millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 451250,225750

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.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 451750,225750


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.

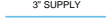



ALS Water Map Key


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.

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

Valves

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

Hydrants








-  Single Hydrant

Meters










-  Meter

End Items

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

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



Operational Sites

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

Other Symbols

-  Data Logger

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

-  **Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
-  **Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

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 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.

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0845 070 9148 quoting your invoice number starting CBA or ADS.	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

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.



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

Appendix C – Proposed Development Layout (West Waddy ADP Drg Nr P01)

This drawing is the copyright of West Waddy : ADP and may not be copied or reproduced without written permission. The Copyright Order 1990 provides for the Planning Authority to copy and distribute drawings for public inspection in relation to a Planning Application only if those copies are marked in the following manner:

"This copy has been made with the authority of West Waddy: ADP pursuant to Section 47 of the Copyright Designs and Patents Act 1988 and for the purposes only of public inspection. This copy must not be copied without the prior written permission of the Copyright owner."

Do not scale from drawings unless for planning purposes only. Use figured dimensions at all other times. In case of doubt contact West Waddy:ADP

Dimensions to be checked on site before work commences and any discrepancies reported to the Architect.

The accuracy of this drawing may be reliant upon survey information provided by third parties. No liability will be accepted by WestWaddy:ADP for errors in or arising from such third party survey information.



PLANNING

- Red Line Boundary (3.271ha)
- ▨ Swale
- ▨ LEAP (3653sqm - 400sqm activity area)
- ▨ LAP (400sqm - 100sqm activity area)
- ▨ Additional Greenspace (5035sqm)
- ▨ Planted Boundary
- Affordable units
- Pumping station
- ▨ Play
- - - Footpath

Rev	Date	Revisions	Initials	Checked
D	11/4/17	Proposed site plan amended including green space and landscaping, eastern built frontage and boundary treatment, footpath and cycle links along southern boundary and revision to house type mix.	GL	
C	17/7/15	'Da', 'Db' house types reverted back to 'D'. Adjustments according to landscape design (AS SUBMITTED 21/07/2015)	JG	
B	16/7/15	Amendment to parking arrangement re plots 32-35, amendment to garden re plot 26, 32 and 33	JG	
A	14/7/15	Hous type D changed to Da, House type Db added. Plot 62 corrected.	JG	

Letchmere Green,
Heyford Park

Proposed Site Plan

The Malthouse
60 East St, Helen Street
Abingdon, Oxfordshire, OX14 5EB
Tel (01235) 523139
Fax (01235) 521662
e-mail: enquiries@westwaddy-adp.co.uk

westwaddy **ADP**



Date 19.04.2017
Scale 1:500 @ A1
Drawn GL Checked HS

Job	Dwg No.	Rev.
626	P01	D

Appendix D – Preliminary Foul Treatment Plant Details



WPL Limited
Units 1 & 2, Aston Road
Waterlooville
Hampshire PO7 7UX
Tel: +44 (0)23 9224 2600
Fax: +44 (0)23 9224 2624
Email: enquiries@wpl.co.uk
www.wpl.co.uk

Quote ref- 5923252 – Camp Road, Upper Heyford

Mr. Steve Watts
Gemma Design Ltd.
Lea View House
Two Rivers Estate
Station Road
Witney
OX28 LLD

9th February 2015

Dear Steve,

WPL Hi-PAF – Sewage Treatment Plant quotation – Camp Road, Upper Heyford

Thank you for your enquiry for a packaged treatment plant to serve the above site. We have pleasure in providing a revised quotation for the equipment to meet your requirements. We have based our design of the equipment on the information you have provided.

In order to keep the size of the system to one tank we have reduced the emptying regime for the primary settlement tank to every 30 days we have specified how much should be removed during these intervals. We can increase this frequency, it will lead to having a two tank solution.

The design of the WPL HiPAf is based on the Submerged Aerated Filtration process and has been successfully installed at many sites similar to your project, the system has a number of distinct advantages:

- Very robust process; consistently complying with discharge permit requirements.
- Low operation and maintenance costs.
- Capability of dealing with variable flows and loads (down to 10% of design load).
- Small footprint, keeping installation costs down.
- Ease of installation, saving valuable time on site.

We hope we have interpreted your requirements correctly, we will contact you shortly to determine the next steps.

Yours Faithfully

Dominic Hamblin
Technical Sales Manager
(07425) 627034



PLANT LOADING DATA:

SOURCE	No. PERSONS	PER PERSON			PER SITE		
		FLOW L/day	BOD g/day	Amm. g/day	FLOW m ³ /day	BOD Kg/day	Amm. N Kg/day
Standard Residential	301	150.0	60.0	8	45.150	18.060	2.408
Total for this enquiry					45.150	18.060	2.408

Peak Flow	1.57	L/sec
Max. BOD Conc,	400	mg/L
Max. NH ₄ -N Conc.	53	mg/L
Desludge Frequency	30	Days
Population Equivalent	301	PE
pH	7 to 9	
Vol. of Sludge removed m ³ (30days)	9.7	m ³

DISCHARGE CONSENT STANDARD:

20mg/l	BOD ₅
30g/l	SS
20mg/l	NH ₄ -N (95 percentile)

SCOPE OF SUPPLY:

The plant consists of an integral primary settlement tank and a biological treatment and final settlement module.

- 1 no. GRP kiosk Large
- 1 no. Side Channel Blower
- 1 no. Electrical control panel
- 1 no. 10m high temp air hose

PLANT SELECTION:

Tank	HP280280200
Inlet Invert Depth (mm)	500
No. of Lids	5
Dry Weight per Tank (Tonnes)	4.5
Length (m)	10.3

Blower motor Rating: 3~ 50Hz 400V 2BH1510 Side Channel Blower

PRICE:

Supplied for the sum of **£37,510.00 EX. VAT.**
 Delivered for the sum of **£650.00 EX. VAT.**



Optional Extras:

500mm Invert Extensions per lid	£532.00
Alarm with kiosk mounted beacon	£203.00
Sample chamber	£180.00
Stand-by blower with auto changeover	£3,036.00

*All the above prices are excluding VAT.

Delivery:	8 to 10 weeks from acknowledgement of order subject to factory workload.
Terms:	40% with order and 60% balance to be paid on notification readiness to dispatch.
Validity:	This quotation is valid for 60 days from quoted date and is made subject to WPL's standard Conditions of Contract

Delivery of WPL Equipment

- a) Delivery to site will be made with an articulated lorry.
- b) Where access to site and/or available space for movement is restricted delivery will be made to the nearest hard road suitable for an articulated vehicle having min. headroom of 5 metres & width of 4.5m.
- c) Upon arrival a crane will be required to offload the plant (by others), the cost and arrangement of all such craneage and lift supervision etc. not included in above prices; cost to be borne by contractor.
- d) On site, at least 2 contractor's site personnel will be necessary to assist in the off-loading operation (no allowance for the cost of the contractor's site personnel allowed for within the 'WPL' prices; cost to be borne by contractor.
- e) If the site has any special access requirements then please advise WPL as earlier as possible so that arrangements for a site visit to verify delivery possibilities, will be charged for at cost to the client.
- f) If there are any access issues that require any special delivery procedures, personnel, equipment or vehicles etc. will be charged for at cost to the client.
- g) Where a wide load is specified. It is essential that sufficient access to the approach to site is sufficient to the site (narrow lanes etc. will need to be highlighted and may result in a transport survey to be carried out at extra cost). Please notify us if a survey is required.

WPL Policy on Delivery to Site

- a) The delivery of WPL equipment to site will be strictly as described above, any departure will be charged for at cost to the client.
- b) WPL will provide any practical and reasonable assistance it can to resolve any issues.
- c) WPL will **not** be providing a "lifting plan" or any lifting supervision unless specifically requested, will be charged for at cost to the client.



- d) Any requirement for delivery personnel to attend H&S lectures, videos or courses prior to or at the time of delivery will be charged for at cost to the client.
- e) Important that the customer to advises WPL by the time of order placement of any additional requirement.
- f) The driver of the vehicle will be the final arbiter of what he considers safe.

PLEASE CHECK THE FOLLOWING:

Where influent includes discharge from a commercial kitchen or catering facility, adequate provision for removal of grease and oils must be provided. No allowance has been made for untreated grease or oils entering the WPL plant.

The plant offered has been designed to satisfy the specified effluent discharge standard, based on the above loadings and strengths. **These must not be exceeded. It is very important to check that the plant loading data matches the operating conditions of the site;** always incorporating any waste water from laundries, catering facilities and nursing homes.

To ensure that the system can treat the incoming Ammoniacal Nitrogen ($\text{NH}_4\text{-N}$) to the guaranteed effluent quality there must be a sufficient level of total alkalinity (as calcium carbonate) within the incoming water supply. The **minimum** level needs to be 7.1 times that of the $\text{NH}_4\text{-N}$ to be removed. In the event that there is insufficient alkalinity, calcium carbonate dosing must be considered, we are able to supply a dosing unit at an additional cost, if required.

If a higher water table or difficult ground conditions are encountered, please seek specialist advice or contact WPL.

PROCESS GUARANTEE

The process is guaranteed to meet the specified discharge standard in accordance with standard sampling procedure.

The following conditions will apply to the above guarantees:

- All aspects of the installation, operation & maintenance manuals and users guide are adhered to
- The flows & loads, which are provided by the client do not exceed those stated on the design sheet
- That the influent pH is between 7 – 9.
- That there is sufficient hardness in the water, where nitrification is required.
- Grease from commercial kitchens is not present in the treatment plant influent.
- Biological inhibitors are not present in the treatment plant influent.
- Performance is measured after the plant is matured.
- Samples are taken in accordance with regulations and best practice.
- The hydraulic loading should not exceed the hydraulic loadings detailed within the design data.



Loading:

- 1) The plant should receive a minimum load of 10% of its maximum design loading at all times, unless otherwise sanctioned by WPL personnel.
- 2) Variable loads – any increase in load should not exceed 40% of the maximum design load spread over a 7 day period.
- 3) The flows and loads do not exceed those stated on the design sheet.
- 4) Pumped flows are controlled to the maximum peak flow to treatment.
- 5) In the event of the temperature dropping below 5 Celsius nitrification may be lost and will only return when temperatures increase to above 10 Celsius for an extended period.

Additionally, the chemicals listed below should be restricted to the stated maximum amounts:

COMPOUND	MAXIMUM (mg/l)
Arsenic	0.1
Boron	0.1
Cadmium	5.0
Calcium	750.0
Chromium (Hexavalent)	0.2
Chromium (Total)	1.0
Colbalt	0.08
Copper	0.05
Cresols	5.0
Cyanide	250.0
Fats Oils and Grease	30.0
Iron	0.1
Lead	50.0
Magnesium	5.0
Mercury	0.1
Nickel	0.25
Perchloroethylene	0.001
Phenols	5.0
Silver	0.05
Sulphates	500.0
Thiourea	0.01
Trichloroethylene	0.001
Zinc	0.2
2-4 Dinitro Phenol	150.0
Free available Chlorine	< 1
Cationic/Anionic Surfactants	< 0.01

**INSTALLATION
MANUAL FOR HiPAF
RECTANGULAR PLANT**

INSTALLATION INSTRUCTIONS

All Rectangular HiPAF's

INDEX

1.	Health and Safety	3
2.	Risk Assessment	4
3.	Introduction	5
4.	Delivery and Lifting	6, 7
5.	Tank Installation	7, 8, 9
6.	Installation of Kiosk	9
7.	Pipe Work, Ducts and Sample Chamber	10
8.	Electrical Installation	11
9.	Plant Description	12
10.	Commissioning	12
	APPENDIX I Kiosk G.A.	13
	APPENDIX II Humus and Turret Extension	14

Rev	Amendments	Date
8	Introduction & installation ref to civil engineer	05.07.06
9	Note regarding water bowser requirement	11.03.08
10	Insert lean mix min ratio	17.04.08
11	Remove HWT	05.11.10

1. HEALTH AND SAFETY

United Kingdom Health and Safety at Work Act 1974

Section 6a of this act requires manufacturers to advise their customers on the safety and the handling precautions to be observed when operating, maintaining and servicing their products.

The user's attention is drawn to the following:

All the sections of this manual must be read before working on the equipment.

Suitably trained and qualified personnel must carry out installation.

Normal safety precautions must be taken and appropriate procedures observed to avoid accidents.

The design factors for the lid loads and materials comply with the British Water Code of Practice, BW:COP.22.96. The lids have been tested with a load at 1.0Kn/m² and will withstand accidental passage. **THEY ARE NOT DESIGNED AS PEDESTRIAN WALKWAYS.**

Refer to WPL Ltd for any further technical advice or product information.

1.1. Health

The following is extracted from a health-warning card supplied to all WPL Ltd staff. It is the client's responsibility to ensure that all necessary protective clothing/equipment is available.

Leptospirosis

There are two types of Leptospirosis that can affect people in the UK:

Weil's disease. This is a serious infection transmitted to humans by contact with soil, water or sewage that has been contaminated with urine from infected rats.

Hardjo-type Leptospirosis, which is transmitted from cattle to humans.

Typical symptoms?

Both diseases start with flu-like illness with a persistent and severe headache, muscle pains and vomiting. Jaundice appears about the fourth day of illness.

How is it caught?

The bacteria can enter your body through cuts and scratches and through the lining of the mouth, throat and eyes.

1.2. Sensible Precautions

After having worked in sewage or with anything contaminated with sewage, wash your hands and forearms thoroughly with soap and water. If your clothing or boots are contaminated with sewage, wash thoroughly after handling them.

Take immediate action to wash thoroughly with clean water any cut, scratch or abrasion of the skin immediately prior to applying any protective covering.

**DO NOT HANDLE FOOD, DRINK OR SMOKING MATERIAL
WITHOUT FIRST WASHING YOUR HANDS.**

**IF, AFTER COMING INTO CONTACT WITH SEWAGE, YOU CONTRACT THE SYMPTOMS
DESCRIBED REPORT TO YOUR DOCTOR IMMEDIATELY AND ADVISE HIM/HER OF THE
CIRCUMSTANCES.**

1.3. Vaccinations

To avoid illness, it is recommended that site personnel have the following vaccinations. (Your doctor may recommend further).

Hepatitis A

Hepatitis B

Polio

Tetanus

Typhoid/Cholera (probably carried out as a child).

1.4. Safety

Sewage gases are potentially explosive and toxic. **DO NOT** enter any of the below ground compartments of the **HiPAF UNLESS PROPERLY QUALIFIED AND EQUIPPED TO DO SO.**

2. Risk Assessment Notes

This section of the manual is intended as a guide and as such does not cater for every situation that may be experienced on site. WPL Ltd assumes that the installer/end user has ensured that all necessary permissions have been sought and granted and that the installation procedures will be carried out observing the requirements of the Health & Safety at Work Act and will involve good building and sound civil engineering practice. Please ensure that due consideration has been given to and appropriate action taken with regard to the following:

- Planning permissions & Building Regulations and other regulating or interested parties.
- Environment Agency consent to discharge.
- The legal responsibility for the plant as far as operation and maintenance and ongoing discharge is concerned.
- **Note – failure to comply with any regulation may result in pollution, odour and nuisance and health hazards, which may lead to legal action.**
- The size of the plant relevant to the number and type of people that will be using it, e.g. domestic, light industrial, etc. Consideration should be given to any unusual conditions such as B & B accommodation, special laundry requirements and frequent entertaining.
- Costs, legal implications and siting in consideration to shared systems.
- The whereabouts of wells, bore holes and springs used as sources of potable water; existing non-mains sewerage systems and soakaways; water courses, ponds and lakes and designated protected areas.
- The whereabouts of other services, pipes, cables, ducts, etc.
- Local ground conditions. Is specialist knowledge of civil engineering required to cater for unusual soil conditions such as underground rivers, running sand, chemicals in the soil, etc?
- The water table at the time of installation. Specialist knowledge is required when installing in an excavation that allows water to enter.
- The water table in winter. Special consideration should be given to installations that will be subject to high water table pressure or flood conditions. The treatment plant will need to be installed so that it cannot “float” out of the ground and provision made for continued discharge of treated effluent, should the discharge pipework/soakaway be under water.
- **Note – failure to maintain the ability to discharge may result in pollution, odour and nuisance and health hazards, which may lead to legal action. WPL can not be held responsible for failure to discharge due to poorly designed, constructed or positioned soakaways and discharge pipework systems.**
- Siting. The plant must be sited within 30m of heavy vehicle access for de-sludging. The plant should, where possible, be sited above the high water table mark and above or beyond the flood plain. See items above and accompanying note. The plant should be sited as far from the habitable parts of the dwelling as possible. Many local authorities recommend 10m as a minimum, but easements are possible for smaller sites.
- Gas & odour ventilation. WPL recommend that the plant be vented. This can be via the vent pipe, normally attached to the building, or by additional venting (high or low level) off of the inlet or outlet pipework or the sample chamber.
- Sample point. A safe and adequate sampling point is usually a requirement of the Environment Agency. This can be an off the shelf item or constructed using standard drainage components. Open pipe discharges to ditches, watercourses, etc, through pipework of less than 5m in length, do not require a sampling point if the effluent can be sampled from the end of the pipe.
- Electrical supply. A qualified electrician (see Electrical Installation section) should only undertake electrical installation. A safe and reliable power supply is required at all times, as the air blower is required to run continuously. Adequate means of air or power failure indication should be provided. This can be an audible or visual alarm or by regular manual checks.
- Due to the health risks associated with raw sewage, WPL recommend that the sewage treatment plant is not used until the system is complete, commissioned and handed over.
- **Before carrying out any maintenance or installation work, the equipment must be electrically isolated. Do not leave covers open for any longer than necessary. Temporary barriers and warning signs should be erected around any open covers or manholes as appropriate, in particular warning of deep water in the tanks.**
- **Any visiting personnel must report to site office or householder on arrival and fully acquaint themselves with safety regulations applicable.**

3. INTRODUCTION

The HiPAF rectangular range of high performance aerated filters has been designed to treat the unscreened effluent from sites with population equivalents in the range of 60 and above. The HiPAF is ideal for remote rural communities, such as housing developments, hotels, camping and caravan sites, or any facility not connected to main sewers.

The process used within the HiPAF has been developed to meet the more stringent discharge consents now being imposed by the Environment Agency, particularly with reference to low ammonia levels. The HiPAF can be designed to achieve ammonia standards better than 5mg/l.

The plant is designed for below ground installation and constructed in GRP. The sewage effluent undergoes three process phases in three distinct sections.

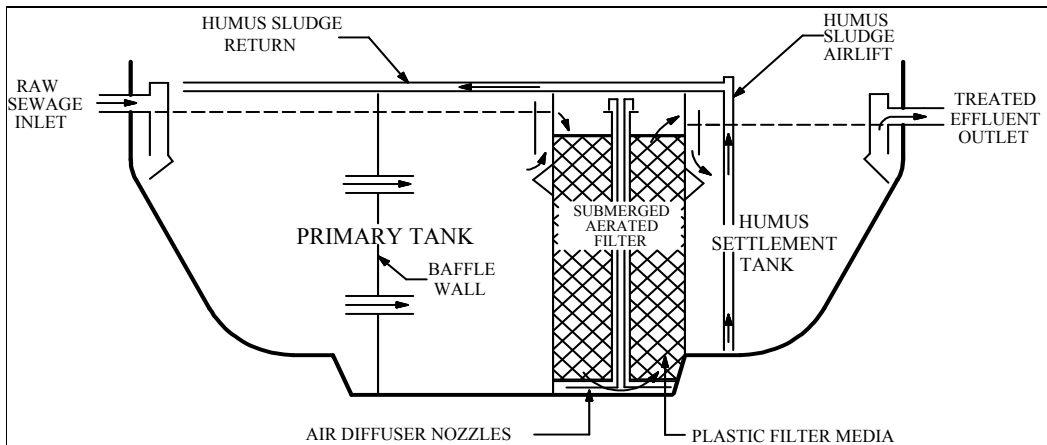
- Primary settlement tank
- Submerged-bed aerated filter
- Final settlement tank

The Primary tank is baffled to prevent the carry over of solids to the filter compartment, and in the larger plants is a separate tank module.

In the filter section the biological treatment of the settled sewage takes place by the process of bacteriological oxidation. The filter tank contains high voidage plastic media on which the oxidising bacteria develop, in the form of a jelly like substance known as 'Biomass'. The media is supported between two perforated plastic plates that allow the passage of air and effluent, but prevents any loss of media.

Located below the lower grid is a set of air diffusers. These diffusers distribute the air across the filter, and can be removed for servicing without emptying the unit or removing filter media.

A GRP Kiosk to house the air blower(s) and a control panel is provided and should be located within 10m of the plant. Consult with WPL for longer distances. Plastic hose is used to connect the air blower to the air diffusers and humus sludge return air lift. 10m lengths of flexible hoses are provided for this purpose.



4. DELIVERY

4.1. Off Loading

The purchaser may be responsible for off-loading at the nearest roadway to site that is suitable for heavy goods vehicles. A minimum height clearance of 16' 6" is required. If there are electrical cables overhead ensure there is a means of turning the power off. For off loading from a lorry mounted HIAB there needs to be a firm area for the stabilisers, the total width being a minimum of 15 feet.

If the nearest road access for a heavy goods vehicle is not adjacent to the site, it is the responsibility of the purchaser to arrange transport from the road to the site. If in doubt contact WPL as soon as possible with any queries.

Inspect the unit for any damage to the base before placing on the ground and then inspect the sides. The unit should only be placed on level ground with no sharp stones, bricks etc. as they may damage the base of the unit.

The control panel and blowers should be stored in suitable conditions i.e. condensation free.

4.2. Extent of Supply

See the delivery note for full details. The standard unit comes with the following:

- A GRP tank or tanks incorporating the three sections
- A blower kiosk with blower(s) and control panel fitted
- Air hoses of 10m length

4.3. Electrical Equipment

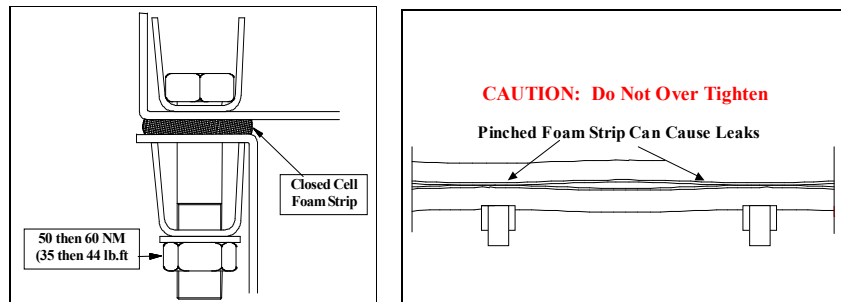
All electrical equipment, including blowers must be stored in clean dry conditions until required for use. If the electrical equipment is fitted into the kiosk, some form of anti-condensation heater will be required if the unit is not to run immediately.

4.4. Bolts and Bolt Strips

Due to the settling of the joints during transportation, the bolts may become loose and need tightening. It is important that the bolt strips are not over tightened as this can cause leaks.

Tighten all bolts in the metal strips to 50 NM to ensure the foam is all compressed then tighten up to a final value of 60 NM.

Silo Bolts (with no metal strips) around the top of the unit should only be tightened to 30 NM.



4.5. Lifting

DO NOT attempt to lift the unit if it contains water in any of the watertight sections. These sections are the primary, submerged aerated filter and humus settlement (see diagram in introduction page 5), and sand filter when applicable.

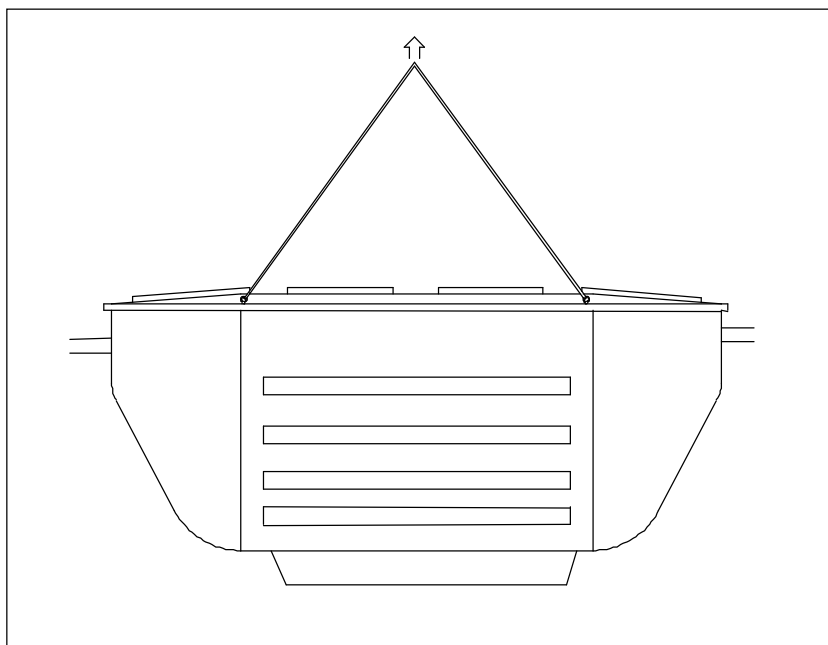
DO NOT walk on top of the units with muddy boots as this will scratch the surface.

Note: Units with extension, for inverts greater than 0.5m, turrets with covers are supplied separately and therefore the unit may collect rainwater.

Lifting eyes are provided around the top flange of the unit for the attachment of suitable strops of equal length. These should create an angle of no less than 60° to the top of the unit to avoid excessive loads on the sides of the structure.

When moving across rough ground great care should be taken to avoid increased loads due to sudden movement of the unit.

WARNING: Care should be taken when attaching lifting equipment as the surface of the unit becomes very slippery when wet.



5. TANK INSTALLATION

Introduction

All installation procedures should be carried out observing the requirements of the Health and Safety at Work Act and involve good building practice.

Calculate the amount of backfill required. THIS IS VERY IMPORTANT. See Section 5.1, Step 7. A qualified civil engineer must be consulted to determine the correct grade of concrete. Lean mix or dry mix, concrete (typically minimum 12:1) must be used to backfill the excavation. However, prevailing local ground condition may override this requirement. If wet mix concrete is to be used, further consultations with a civil engineer may be required. Note: the pour cannot take place in a single operation. Contact WPL for further information.

During the course of installation the following will be required:

- ❖ Normal construction equipment and plant
- ❖ Concrete for base. This MUST be designed to support the unit for normal operation.
- ❖ **Adequate supply of water to fill unit – Note a water bowser will be required, as filling via a tap will take an excessive period of time**
- ❖ Pumping equipment where necessary.

N.B. Installing in an excavation that allows water to enter (i.e. is not dry) requires special advice. Water table and flood conditions are typical examples that will cause problems during installation. It may also affect the operation of the plant. Again, specialist advice must be taken in these conditions.

Installation Manual for HiPAF Rectangular Plants

Venting - All sewage treatment processes produce waste gasses and this can give rise to unpleasant odours. To avoid problems it is important that a high level vent is available close to the plant for venting. This vent may be from the inlet or outlet of the plant, but the inlet is preferred.

5.1. Installation of Unit.

Step 1 Excavate to tank dimensions (see GA Drawings) with minimum of 150mm clearance all round and under base of unit. Allow adequate clearance for all pipes and any other connectors to the unit.

Note: Dimensions are detailed on the GA Drawing for each individual plant which is sent to the customer with confirmation of order. If this has been lost, please contact WPL for another copy.

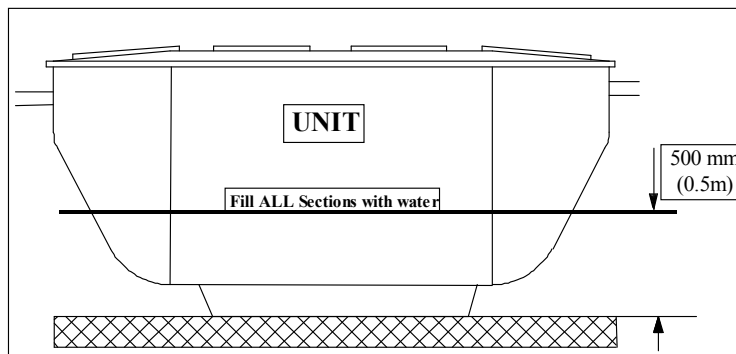
Step 2 Cast the concrete base; ensure that the slab is designed to support the unit in its normal operation (i.e. full of water). The base must be level and to the correct height to suit the invert level of HiPAF inlet. Allow for initial set before positioning the unit.

Step 3 Excavation must be kept dry during the installation and until the concrete has cured.

Step 4 Ensure the surface of the concrete base is free of water; stones etc. and lower the unit into correct position to suit pipe connections. Check the levels.

Step 5 Stabilise unit in excavation, taking care not to cause distortion of the unit. Fit temporary covers over all pipe connections.

Step 6. Commence filling unit with water into all sections to a level of 500mm.



Step 7 Commence back filling with lean mix- (Mix ratio to be determined by a qualified civil engineer). The back fill must be evenly placed around the unit at all times and worked by hand up to a maximum level of 400mm above the base.

NOTE: The base of the humus tank is approximately 455mm higher than the preceding tank section(s). WPL advise that concrete blocks and appropriate shims are placed on the slab to support this section during back filling.

DO NOT USE VIBRATING POKERS

The water level in all sections must be increased and be kept at a level of 300mm above the top of the backfill, until final pour after step 8.

Step 8. When the backfill is approximately 0.5m below the lowest underground connections, pipe connections should be made. Remove lifting eye nuts and bolts and replace with green silo bolts supplied. Also provide for a hose draw chamber, (consisting of a brick/block work chamber with removable access cover circa 300mm, square by 300mm deep) to allow access to hose tails, servicing ducts for the air lines and future cable connections to the unit via bulkhead connectors. If not factory fitted, fit bulkhead connections through tank top or extensions with the orientation to suit the site.

Step 9 Continue to fill with water and backfill to the rim of the tank.

See Appendix II for directions where the invert depth is greater than 500mm.

Step 10 Leave unit full of water.

N.B. See Appendix I for Kiosk Slab Dimensions and type of kiosk supplied.

5.2. Local Ground Conditions

The local ground conditions must be taken into account when installing the unit. The amount of concrete backfill used must be sufficient to overcome the effects from up thrust of ground water.

The unit is designed with internal non return valves in the primary tank to relieve any ground water pressure and thus damage, when the primary tank is desludged.

The concrete slab must be swept clean of any debris to ensure the non return valve does not become blocked

The concrete backfill must be designed to stop the water table pressure damaging the tank. **A qualified engineer must be consulted to determine the civil design.**

6. Installation of Kiosk

Step 1 Lay a concrete slab, sized to suit the kiosk (see Appendix I), above the adjacent surface water level (and the flood plain) to avoid surface water ingress. Provision for servicing ducts for air lines, cables and mains power should be made.

Step 2 Lay the ducting from kiosk to the unit, mains supply and any pumping chambers or sand filter.

Step 3 When the concrete slab has fully cured secure kiosk to the slab and seal to the concrete with mastic.

6.1. Connections to Kiosk

Step 1 The air hoses will have been delivered laying on top of the filter section of the unit. Feed the hoses down the duct and connect to the bulkhead connectors on the side of the unit. Jubilee clips are either secured to a blower or in the delivery envelope. Cut the air lines to length to allow connection to the blower in the kiosk, ensuring that there are no kinks or sharp bends in the lines. It should be noted that the pipe becomes warm during operation, softens and may deform at sharp bends.

Note : If the distance from the blower to the kiosk is over 10m, it is recommend that the air hose is increased in diameter to account for the pressure loss of the excess distance-Consult WPL for further advice

Step 2 Electrical Connections See Section 6

7. PIPE WORK, DUCTS AND SAMPLE CHAMBERS

7.1. Pipe Work

Gradient. It must be ensured that there is a sufficient fall (gradient) from the dwelling to the invert level of the inlet pipe, normally 0.5m below top lip of the unit. A fall between 1:40 and 1:100 is usually required to give a self-scouring velocity that prevents blockages in the pipes.

Venting. The plant must be vented via the inlet or outlet; a rotary disk with two holes is fitted to the top of both the inlet and outlet dip pipe assembly. Re-position the disk as required, leaving open the connection that is to provide the vent.

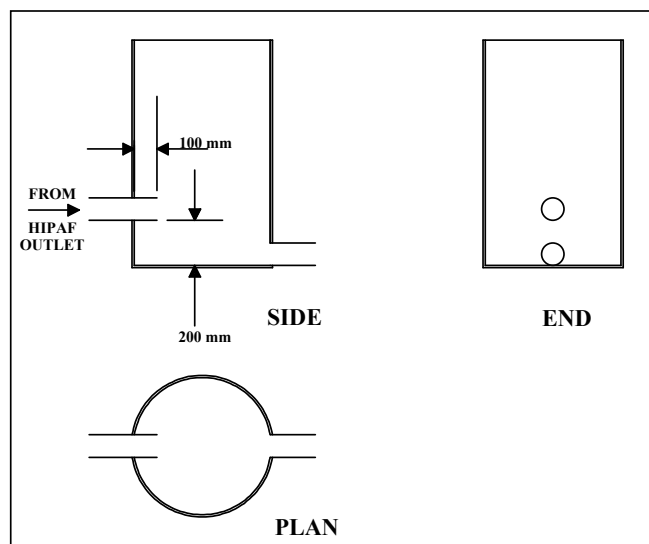
7.2. Ducts and Hose Draw Chambers

Ducts are required for all hose and electrical cable connections between the kiosk and the various sections of the unit. Ducts may also be required between where units are built in more than one section. At the unit end of the ducts a 'Hose Draw Chamber' is required to enable the connections to be made to the unit. The Hose Draw Chamber should be at least 300mm square and of a suitable depth to suit the connections (consisting of a brick/block work chamber with removable access cover circa 300mm square by 300mm deep). Ducts to the kiosk should run uphill if possible to avoid flooding the kiosk with surface water. The kiosk base should be above the surrounding ground level to avoid flooding.

7.3. Sample chamber

Positioning - This should be close to the outlet from the plant to provide a point at which the EA can take a sample.

Dimensions - The sample chamber should incorporate a large enough drop to allow a sample container to be filled with the treated discharge. The drawing below gives an indication as to dimensions.



8. Electrical Installation

Due to the variance of the sites and installation configurations it is not feasible to state a specific installation configuration to suit all sites. Therefore it is important that the electrical installation is performed by a qualified electrician in accordance with the 16th or later edition of the I.E.E. regulations, with appropriate current protection devices for the site configuration.

The supply to the HiPAF should have a dedicated circuit incorporating isolation and protection devices to the regulation requirements of the Institute of Electrical Engineers. An earth leakage circuit breaker is recommended and should be incorporated into the supply to the HiPAF unit (a device with a 30mA maximum trip current is recommended).

N.B. The wiring diagram is in the electrical control panel inside the kiosk. If it is missing or lost please contact WPL for another copy.

8.1. Three Phase connection

When the 3-phase supply is switched on ensure the correct rotation of the blowers, as incorrect rotation will cause damage if run for more than a brief check. This check must be done with the all airlines disconnected from the blowers.

IMPORTANT NOTE: IF THE THREE PHASE IS NOT CORRECTLY CONNECTED SERIOUS DAMAGE CAN OCCUR. SHOULD A POWER FAILURE OCCUR ISOLATE THE SUPPLY TO THE UNIT. WHEN POWER IS RECONNECTED ENSURE THE PHASES AND ROTATION ARE CORRECT.

9. Plant Description

This description is only supplied for interest and is not essential reading for plant installation, operation or maintenance. The standard HiPAF will be supplied as a one-piece unit, internally divided into 3 sections. The function and operation is as follows: -

9.1. Primary Tank

This receives the flow of raw sewage directly from the foul sewer or pumping station. The design of this section reduces the upward flow velocity of the sewage to less than 0.9 m/hr at peak flows into the plant as specified in BS6297. At this low velocity any suspended matter is no longer carried and thus settles out as sludge in the bottom of the tank, to be removed by tanker as necessary. This settlement reduces the biological oxygen demand (BOD) of the clarified liquor flowing into the aerated filter section by up to 30%.

The volume of liquor in this section also service to equalise the strength of the incoming sewage before it flows into the next section.

The inlet and outlet to the tank are baffled to avoid disturbing the settlement of solids. The section also has a baffle across the flow from inlet to outlet to assist in holding back any floating scum that may occur.

An airlift removes any settled solids and some aerated liquor from the final settlement section and returns to the first part of the primary section. This treated liquor helps to keep the primary tank from turning septic and producing bad odours.

9.2. Submerged Bed Aerated Filter Section

WPL's innovated submerged-bed aerated filter houses a hybrid version of two well-established biological treatment processes. It is a combination of a fixed film reactor system and a suspended floc dispersed growth system for bacteriological oxidation, with the high transfer rates and operational control of the dispersed growth system.

The filter contains high voidage plastic media, on which a wide range of sewage digestion organisms developed. The process of biological oxidation gives off carbon dioxide and humus sludge as by-products. The supply of air is introduced at the bottom of the filter by a series of bubble diffuser nozzles.

The humus sludge produced as a result of bacteriological oxidation in the filter bed is transferred with the liquor into the final settlement section.

9.3. Final settlement section

This section is designed to allow humus sludge produced in the filter section to settle out and be returned to the primary section by an airlift. A timed valve, initially set for 3 minutes every 45 minutes controls the airlift.

To assist in collecting the sludge the end of the section is conical and the sides also slope to concentrate the sludge into a small area around the airlift pipe.

10. COMMISSIONING

For commissioning, carry out the checks as in section 4.03 "Annual Checks" of the Operation and Maintenance Manual. The plant should then be left running as normal. It takes time, depending on the temperature, for the plant to grow a stable biomass when it is first started up. This is 3 to 6 weeks for the process to start reducing the BOD. It then takes another 4 weeks for the process to start reducing the ammonia. This process is dependent on a number of factors, including temperature. Start up time may be longer in winter periods.

APPENDIX 1

KIOSKS AND BASE SLABS

WPL supplies a wide variety of blower types depending on the size of plant and site requirements. It is not possible therefore to demonstrate in a general manual the layout for the ducting exit for each kiosk. However, WPL will provide drawings on request showing the layout of the client's bespoke kiosk.

For each kiosk type there is however one standard concrete slab size and listed below are kiosk descriptions and slab sizes. In each case the slab should be cast deep enough to take the weight of the blower(s) designated. Please refer to WPL before laying the concrete.

Medium Kiosk

WPL's medium kiosk has a gull-wing type opening, with the front hinging upwards to give easy access.

The concrete slab should be 1200mm x 950mm.

Large Kiosk

The large kiosk has a standard front opening door. The concrete slab should measure 1400mm x 1600mm.

Extra Large Kiosk

This kiosk has a gas-strut supported opening lid and door for easy access. The concrete slab for this item should be 1400mm x 2200mm.

Note:

Ensure that there is unobstructed air flow from all the vents otherwise overheating will occur.

Ensure the kiosk is installed above any areas likely to flood.

APPENDIX II

Extensions – Humus and Turret

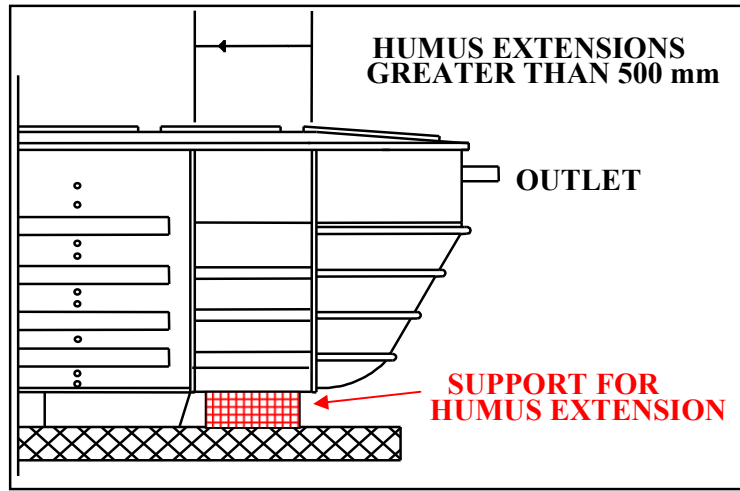


Fig 1: Position of humus extension

Units installed with an invert deeper than 500mm are supplied with extension turrets. These should have concrete lintels placed around the turrets (Fig 2) to prevent undue pressure to the top of the unit. Concrete backfill should then be placed over the lintels and around the turrets to the required level.

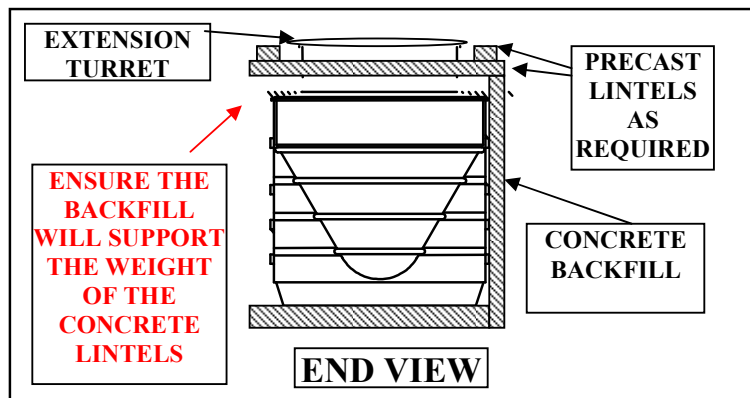
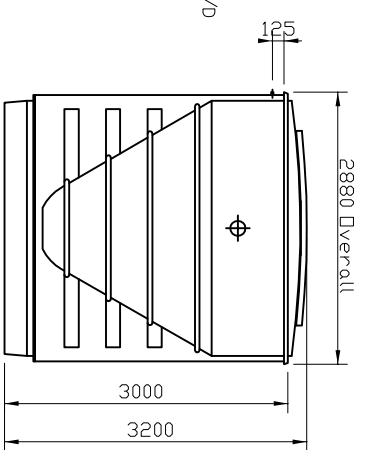
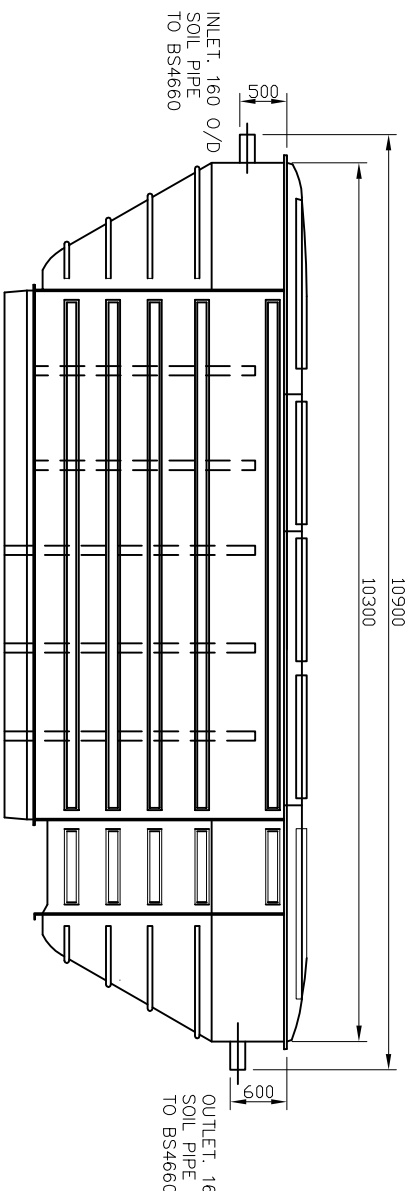
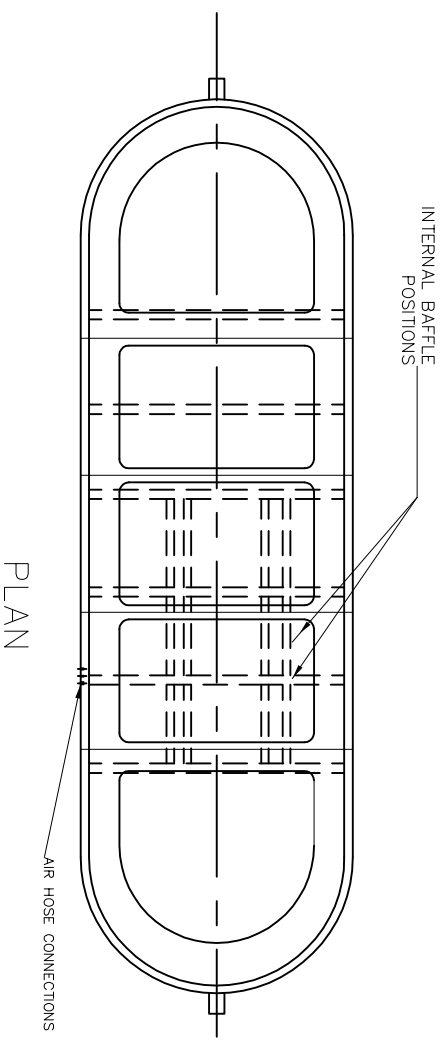


Fig 2: Position of concrete lintels



SIDE ELEVATION

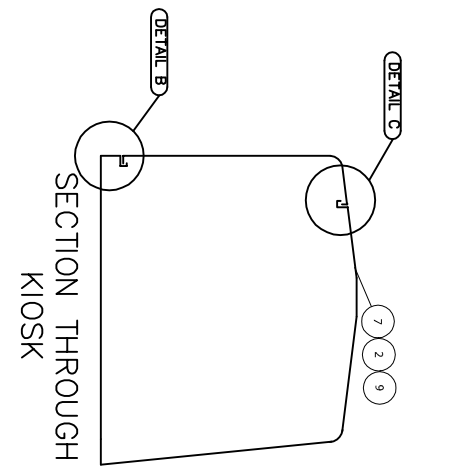
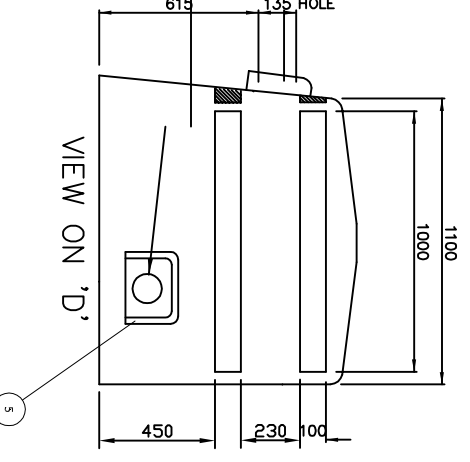
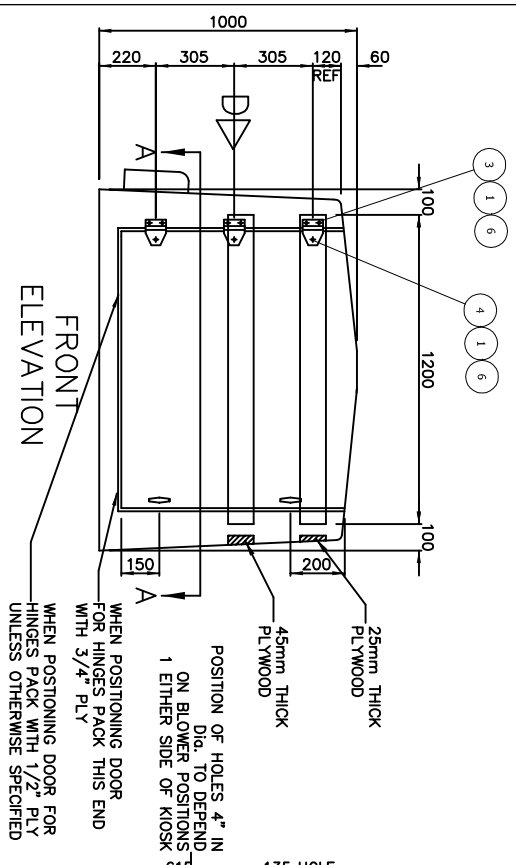
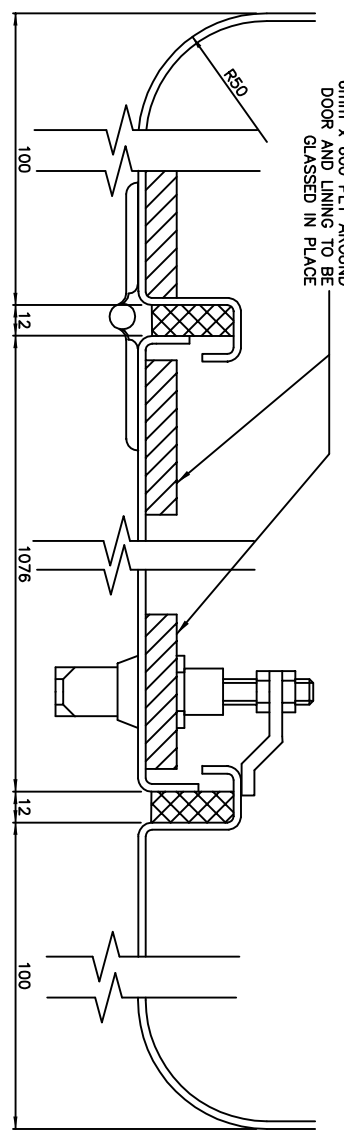
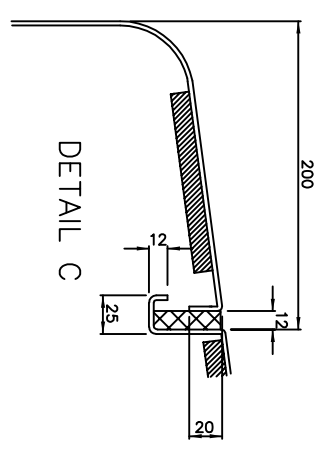
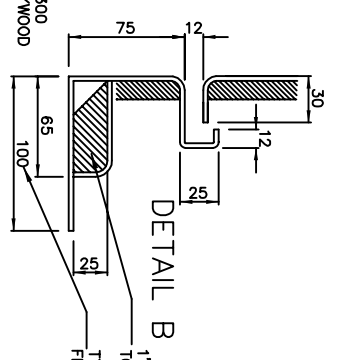
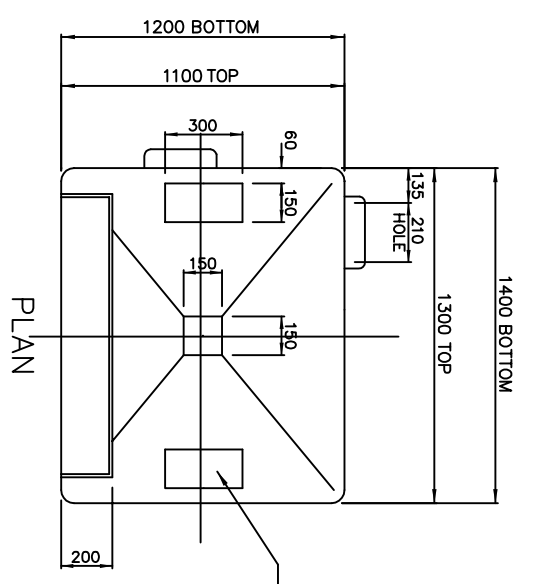
END ELEVATION



PLAN

NUMBER OF BLOWERS: 1 <input type="checkbox"/> 2 <input type="checkbox"/>	FULL LOAD CURRENT AMPS: <input type="text"/>	
AVAILABLE ON SITE: <input type="checkbox"/>	PHASES: SINGLE <input type="checkbox"/> 3 PHASE <input type="checkbox"/>	
<p>STANDARD POSITION OF HOSE DRAW CHAMBER (INDICATED BY H.D.C.) & HINGES (INDICATED BY ARROWS). IF ALTERNATIVE POSITION IS REQUIRED PLEASE TICK BOX AND RETURN TO WPL</p>		
ESTIMATED DRY WEIGHT : 3.9 Tonnes	CUSTOMER:	CUSTOMER SIGNATURE:
ESTIMATED OPERATING WEIGHT : 49 Tonnes	SITE:	DATE:
	ON:	

DESIGN	ISSUE	DATE	CHANGE	INITIAL	<p>WPL LIMITED 1 & 2 ASTON ROAD WATERLOOVILLE HAMPSHIRE PO7 7UX TEL: (02392) 242600 FAX: (02392) 242624 e-mail: engineering@wpl-limited.co.uk</p> <p>© This drawing is the copyright of WPL Ltd</p>
KDS	A	10-01-2014	NEW DRAWING		
CHECKED					
TH					
DRAWN					
CT					
SCALE	N.T.S.	DWG'S IN	m/m	PAPER SIZE	A4
TOLERANCES	+/-	10mm		TITLE	HP280280200 GENERAL ARRANGEMENT
MATERIAL	GRP			DRAWING NUMBER	HP280280200
FINISH					
		DK GREEN 14 C 39 TD BS4800			



ESTIMATED WEIGHT 100KG

DESIGN	ISSUE	DATE	CHANGE	INITIAL
A	09/09/94		NEW DRAWING	
B	04/01/95		HOLE FOR OUTLET TO 4" CUT OUT	PD
C	04/03/96		DA DIMS ADDED	PD
D	09/07/02		VENT HOLES AMENDED	PD
E	16-09-05		WOOD MOVED	MS
F	09/07/2014		WEIGHT ADDED	KM

CHECKED	DATE	CHANGE	INITIAL
A	09/09/94	NEW DRAWING	
B	04/01/95	HOLE FOR OUTLET TO 4" CUT OUT	PD
C	04/03/96	DA DIMS ADDED	PD
D	09/07/02	VENT HOLES AMENDED	PD
E	16-09-05	WOOD MOVED	MS
F	09/07/2014	WEIGHT ADDED	KM

WPL

WPL LIMITED
1 & 2 ASTON ROAD
WATERLOOVILLE
HAMPSHIRE
PO7 7UX
TEL: (02392) 242600
FAX: (02392) 242624
e-mail: engineering@wpl-limited.co.uk

SCALE	TOLERANCES	DIMS IN	PAPER SIZE	TITLE
N.T.S.	+/- 2MM	mm	A4	KIOSK, LARGE
FINISH	GRP			
DRAWING NUMBER	DD-160-065			

Appendix E – Thames Water Sewer Requisition Enquiry



Gemma Design Ltd
FAO: Mr S Watts
Lea View House
Two Rivers Estate
Station Lane
Witney
OX25 4LD

Developer Services – Customer Led

Your ref
Our ref X4502/1012/PDB
Name Paul Bergin
Phone 07747643786
E-Mail paul.bergin@
thameswater.co.uk

02 June 2015

Dear Mr Watts,

Public Foul Water Sewer Requisition
Sections 98-101 Water Industry Act 1991
Camp Road, Upper Heyford.

Further to your requisition application no. **X4502/1012** for a foul water public sewer to connect the above development to the existing sewerage system, please find attached a project estimate summary based upon our preliminary investigations.

The project estimate of **£2,852,200.00** for the foul sewer works identified within the attached report has been produced for indicative purposes only and has been constructed using standard budget estimate rates in the absence of detailed site, soil, utility and design information. This budget estimate is to enable you to decide whether you wish us to proceed with the requisition and associated hydraulic network reinforcement by commencing full design and approaching affected landowners. The estimated developer's contribution based on the inclusion of sewer connection from the site is **£2,768,217.00**.

Should you wish to proceed your particular attention is drawn to the need for:-

- timely payments;
- details of CDM arrangements and appointments made by the "Client".

The requisition project will proceed on the basis outlined in section 5.0 of the initial report.

Thames Water Utilities Limited
Clearwater Court
1st Floor West
Vastern Road
Reading
Berkshire. RG1 8DB

www.thameswateruk.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading, Berkshire. RG1 8DB

The estimated programme depending upon prompt payments, appropriate noticing, agreed land entry etc., is:-

Lead-in period	08 weeks
Detailed Design	12 weeks
Procurement	08 weeks
Notices	12 weeks
Approvals	04 weeks
Construction	20 weeks
<u>Total</u>	64 weeks

Please note that our obligations under the Water Industry Act require delivery of the requisitionable works within 6 months commencement from the relevant day. In this instance the relevant day is determined from receipt of the developer's undertaking and contribution in accordance with Section 99 WIA 1991 (Financial Conditions of Compliance). In certain circumstances the scale, scope, third party influences on the project maybe such that it will be unreasonable to deliver the works within this timeframe based on the estimate attached above, this can only be determined during the lead in and detailed design stages mentioned above. Should this be the case then we reserve the right to revisit these costs, however a renegotiation of deliverables prior to receiving your contribution would be recommended.

When responding, please would you let us know your anticipated programme indicating when you would like Thames Water to commence works on site. This will allow us to programme in your works accordingly and subject to the comments of the previous paragraph.

If you wish to proceed, a minimum deposit payment of **£100,000.00** will be required to initiate the project and commence detailed design. Additional funding may be required during the detailed design stage dependent on the scope of the design work necessary.

Revised total project costs will be recalculated at pre-construction stage when the Advance Contribution will be recalculated and requested, as applicable.

Cheques should to be made payable to Thames Water Utilities Ltd and forwarded to the above address **quoting the Application no. X4502/1012** or attached to a copy of this letter.

It is essential that the Client for the development project appoint Thames Water as "Designer" of the sewer requisition project for CDM purposes and

that Thames Water has details of the relevant CDM Co-ordinator and Principal Contractor. Thames Water will also require a copy of the HSE Notification Form F10. Without this information Thames Water will not proceed.

Yours sincerely,

Paul Bergin

pp Design Manager
Customer Led
Developer Services

Encl



X4502-1012 Camp Road, Upper Heyford - FWS Requisition

Background

PYE Homes submitted a Section 98 application to Thames Water for the connection of foul flows for a proposed development on Camp Road, Upper Heyford, Oxon OX25 5TA. The development is to comprise of approximately 73 residential dwellings. The development site is located within RAF upper Heyford, and the closest Thames Water foul network is located approximately 2,000m to the west of the development site. This project delivers a foul sewer connection to enable the discharge of foul flows from the development.

Due to existing flooding in the foul network, the outline design solution is to by-pass the existing foul network and discharge the development flows directly into Upper Heyford STW approximately 3km away. Due to the topography of the ground between the development site and the STW, the proposal is to install a rising main to the highest point and then gravitate directly to the STW.

Legislative requirement

This project is in response to a notice for a Public Sewer Requisition served under Section 98 of the Water Industry Act 1991

Scope of works

The developer is to construct the onsite pumping station and rising main under a S104 agreement. The proposed FWS requisition will start from the boundary of the development site and comprise of an extended rising main along Camp Road, discharging into a new gravity sewer which discharges into Upper Heyford STW. The proposed sewer is mainly within public highway, however the last 270m crosses private land to connect into the STW.

Major items for the requisition include:

1. Detailed design (model assessment, environmental screening, surveys, private land negotiations etc.)
2. 1600m of 125mm OD SDR11 PE100 rising main within Camp Road (tarmac) complete with 1No. Washout chamber, 1No. Air-

valve chamber and 13No. access chambers.

3. 1 x 1200mm diameter PCC break manhole for rising main connection point on Camp Road.
4. 500m of 150mm VC pipe along Camp Road (tarmac), 670m of 150 VC pipe along Station Road (tarmac), and 270m of 150 VC pipe within private field between Station Road and Upper Heyford STW discharging directly into MH SP49254303.
5. 4No. 1200mm diameter PCC manholes on Camp Road, 8No. 1200mm diameter PCC manholes on Station Road, and 2No. 1200mm diameter PCC manholes within private field between Station Road and Upper Heyford STW.
6. Temporary flow management during connection

Delivery options

Infrastructure alliance

CDM Responsibilities

The project is notifiable. The developer will be the CDM Client and appoint the Principal Designer and Principal Contractor.

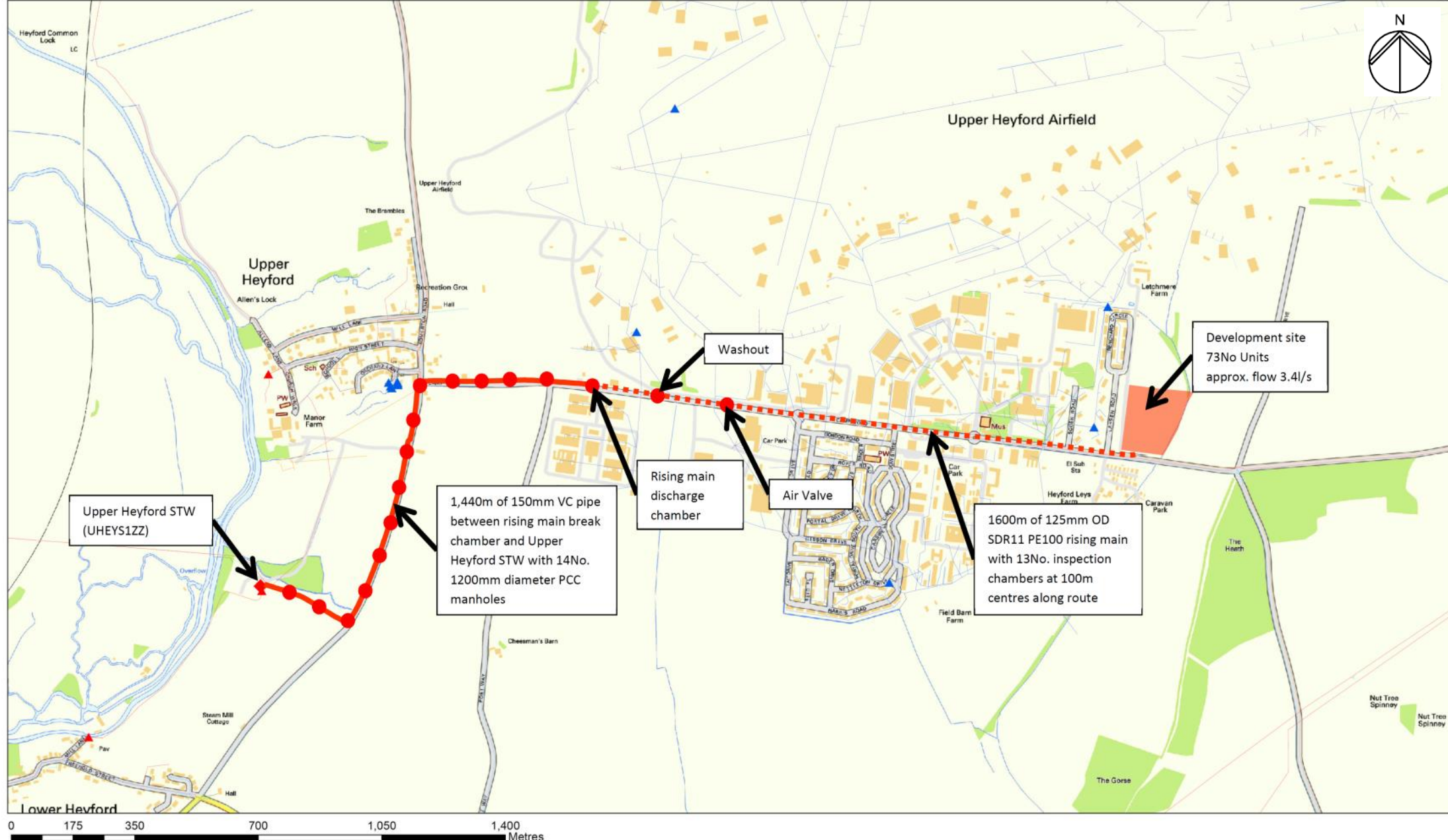
Programme

The project has a 64 week programme

Funding

The total estimated project cost is £2,852,200.00 and the customer's contribution (DAD calculation) is £2,768,217.00 in accordance with S99,100 Water Industry Act 1991.

Camp Road, Upper Heyford OX25 5TA



The position of any boundary or apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. No liability of any kind whatsoever is accepted by Thames Water for any error or omission.

Budget Estimate

Summary of Estimated Costs



TW Project No.: X4502 /1012

Scope:

1. Pre-detail model assessment.
2. Environmental screening assessment.
3. 10 x full manhole survey.
4. Full utilities search.
5. Topographical and buried services survey including cover levels of manholes - approximately 3 days survey work.
6. Install approximately 1600m of 125mm OD SDR11 PE100 rising main with minimum 1.2m cover in Camp Road (tarmac).
7. Install 1No. Washout chamber, 1No. Air-valve chamber and 13No. access chambers along rising main route.
7. Install 1 x 1200mm diameter PCC break manhole for rising main connection point on Camp Road.
8. Install approximately 500m of 150mm VC pipe (approx 1.4-2.5m deep) along Camp Road (tarmac), 670m of 150 VC pipe (approx 1.4-2.5m deep) along Station Road (tarmac), and 270m of 150 VC pipe (approx 1.4 - 2.5m deep) within private field between Station Road and Upper Heyford STW discharging directly into MH SP49254303.
9. Install approximately 4No. 1200mm diameter PCC manholes (approx 1.4-2.5 deep) on Camp Road, 8No. 1200mm diameter PCC manholes (approx 1.4-2.5m deep) on Station Road, and 2No. 1200mm diameter PCC manholes within private field between Station Road and Upper Heyford STW.
10. Temporary flow management during connection into STW - dry weather flow in the existing sewer needs to be confirmed.

11. Public Relations input.
12. Trial Holes.
13. Part Road closure to ensure adequate working space for proposed works.
14. Private land negotiations.

Applicable legislation:

Water Industry Act Requirement

Estimate build up:	£	£
Construction costs		
Thames Water estimated contractor costs, including labour plant materials		2,022,500
Contingency		
Contingency assessment of risks to the project based on current information	15.00%	303,400
External resources and associated costs		
Project Management	5,700	
Design	4,500	
Commercial	22,800	
Construction management	-	
Operations	3,800	
Other project costs	<u>146,000</u>	182,800
Overheads		
TW Programme Overhead	10.20%	255,900
Internal resources		
Project management	8,600	
Design	6,800	
Commercial	5,700	
Construction management	66,500	
		<u>87,600</u>

Total estimated project costs 2,852,200

Customer Contribution - Discounted Aggregate Deficit Calculation 2,768,217

Advance Customer Payment required to proceed with detailed design stage: 100,000



Customer Agreement

TWUL Ref: x4502/1012

Site Address: Camp Road, Upper Heyford.

Works Required: Foul Water sewer requisition.

Payment Amount: £..... (excl VAT)

Thames Water Utilities are hereby authorised by to carry out activities and incur costs to progress the works required as set out above for which the payment amount set out above, and any future associated payments, are deposited:

Signed:

Signed:

Print Name:

Print Name:

For and on behalf of:

For and on behalf of:

Thames Water Utilities Limited

.....

Position:

Position:

Dated:

Dated:

Appendix F - Foul Water Drainage Strategy Plan (Drawing 3858-GDL-XX-D-DR-C-002)

NOTES

DESIGNERS CDM NOTE

THERE ARE NO SUBSTANTIAL RESIDUAL RISK ITEMS IDENTIFIED

GENERAL NOTES

- All dimensions in millimetres and levels in metres
- This drawing is to be read in conjunction with the relevant Architects/Engineers drawings, specifications and CDM documentation
- This drawing has been produced electronically and may have been photo reduced or enlarged when copied. Work to figured dimensions only (DO NOT SCALE). All dimensions to be checked on site. Any errors or omissions to be reported to the engineer immediately.
- This drawing contains coloured lines / information that may not be clear if printed / reproduced in monochrome

KEY

- Proposed Surface Water Sewer
- Surface Water Manhole
- FFLXXX.XX Finished floor level
- Site Boundary

NOTE
The Proposed Floor Levels Shown Are Indicative & Are Provided For Drainage Strategy Purposes Only.



P3	MB	SW	Layout Revised	19/04/17
P2	AA	SW	Layout Revised	20/07/15
P1	AA	SW	Preliminary Issue.	17/07/15
Rev	Drawn by	Chk'd by	Comments	Date



TITLE
Foul Water Drainage Strategy
Letchmere Farm
Camp Road
Upper Heyford

SCALE
1:500 @ A1

DATE July 2015	DESIGNED BY AA	PROJECT NO. 3858
-------------------	-------------------	---------------------

DRAWING NUMBER 3858-GDL-XX-D-DR-C-002	REV. P3
------------------------------------------	------------

Gemma Design Limited
Consulting Civil & Structural Engineers
Lea View House, Two Rivers Estate, Station Lane, Witney, Oxon. OX28 4LD
Tel: Witney (01993) 705522/771544
E-mail: info@gemma-design.co.uk
Web: www.gemma-design.co.uk

STATUS S2	PURPOSE OF ISSUE PRELIMINARY
--------------	---------------------------------