Appendix E

Thames Water Pre-Development Enquiry Application

Sam Cogan

From: Sam Cogan
Sent: 07 March 2018 14:08
To: 'DEVELOPER.SERVICES@THAMESWATER.CO.UK'
Subject: pre development enquiry request (50 Redington Road, London, NW3 7RS)
Attachments: 70589__TW Asset Location Search.pdf; 70589__TW Foul Drainage Calculations.pdf; 70589_existing development plan_50 Redington Road.pdf; 70589_proposed development plan_50 Redington Road.pdf; 70589_Surface Water drainage calculations_50 Redington Road.pdf; 70589_Surface Water drainage calculations_CSD_50 Redington Road.pdf; 70589_TW_pre_dev_app_form_50 Redington Road.pdf

Good afternoon,

We would like to make an application for a Thames Water pre-development enquiry for 50 Redington Road, London, NW3 7RS.

Please find attached the relevant documents pertaining to the Site.

Can we have a confirmation of receipt of the application and please can you send the payment details asap.

Kind Regards

Sam

GeoSmart Information
Environmental Thinking

Sam Cogan
Flood Risk Consultant

t. +44 (0)1743 298 100
e. samcogan@geosmartinfo.co.uk
@geosmartinfo
www.geosmartinfo.co.uk

Update in
5 working days.

Mr S Cogan
Geo Smart Information Ltd
Suite 9-11, Old Bank Buildings
Bellstone
Shrewsbury
Shropshire
SY1 1HU

Our Ref number
DS6045715

Developer.services@thameswater.co.uk

0800 009 3921

Mon – Fri 9am-5pm,

20/03/2018

Pre Development Enquiry

Site Address: 50 Redington rd London NW3 7RS

Site details: as per Pre dev application dated 7th March 18' (1 Residential unit)

Dear Mr Cogan

I write in relation to the above site and your Pre Development application regarding the proposed development. We have completed the assessment and review of your application, in relation to the sewer capacity within the existing TW sewer network.

Foul Water

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

Surface Water

Surface Water :-

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

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

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

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

If they are consulted as part of any planning application, Thames Water Planning team would ask to see why it is not practicable to attenuate the flows to Greenfield run-off rates i.e. 5l/s/hectare of the total site area or if the site is less than hectare in size then the flows should be reduced by 95% of existing flows. Should the policy above be followed, we would envisage no capacity concerns with regards to surface water for this site.

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

Surface water discharges should ideally go to soakaways / infiltration basins / watercourses (if any present in area). **If it can be illustrated that none of the above are feasible then surface water discharges should be stored on site and attenuated, to the satisfaction of the local authority stipulation. To this end you have to liaise with the local authority and discuss their criteria regarding surface water discharges in that area and adhere to their stipulation**.

At no account should the foul flows be discharged to TW Surfacewater sewers

Also at no account should the surfacewater flows be discharged to TW Foul sewer network.

Please Note

All connection requests are subject to a full Section 106 (Water Industry Act 1991) application before the Company can confirm approval to the connection itself. Please also note that capacity in the public sewerage system cannot be reserved.

Note on trunk sewers: Connecting directly to Trunk sewers can be complex and dangerous, which means we often refuse permission. In this case, you will need to find an alternative sewer

or method of discharge. Please contact the Sewer Connections team through our Helpdesk on 0800 009 39 21 for further information.

If Thames Water permits a connection to the trunk sewer, we will insist on carrying out the connection ourselves under Section 107 of the Water Industry Act. We would advise for you to apply as soon as possible.

The discharge of non-domestic effluent is not permitted until a valid trade effluent consent has been issued by Thames Water. If anything other than domestic sewage is discharged into the public sewers without the above agreement an offence is committed and the applicant will be liable to the penalties contained in Section 109(1) (WIA 1991).

Applicants should contact Trade Effluent prior to seeking a connection approval, to discuss trade effluent consent and conditions of discharge. A Trade Effluent reference number should be obtained and included in the relevant box of the attached application form. The address for Trade Effluent is - Thames Water Utilities Limited, Waste Water Quality, Crossness Sewage Treatment Works, Belvedere Road, Abbeywood, London. SE2 9AQ. Alternatively you can telephone them on 020 8507 4321

Please note that the views expressed by Thames Water in this letter are in response to this pre development enquiry at this time and do not represent our final views on any future planning applications made in relation to this site.

We reserve the right to change our position in relation to any such planning applications.

If you have any further queries then please do not hesitate to contact me, on siva.sivarajan@thameswater.co.uk

Yours sincerely,

Siva Sivarajan

Developer Services- Senior Adoptions Engineer

Office:0203 577 7752

siva.sivarajan@thameswater.co.uk

Thames Water Utilities Ltd, Clearwater Court, Vastern Road, Reading, Berkshire, RG1 8DB

Thames Water

WATER INDUSTRY ACHIEVEMENT AWARDS 2017 FINALIST

DS6045715 DTS57485

Application for a pre-development enquiry

Application form

You can go to our website **thameswater.co.uk/buildover** and apply online or complete this form and return to Thames Water, Developer Services, Clearwater Court, Vastern Road, Reading RG1 8DB

Guidance notes

Pre development enquiries are designed to aid developers and their consultants in understanding the impact of their proposed development on Thames Water sewerage network.

You may also use this application form to enable early discussion/meeting on planning issues such as Flood Risk Assessments, capacity checks, drainage strategies and pre S104 application layouts.

Once we have received your appliation Thames Water will undertake a simple desktop study to determine your sites impact on our network and identify if any detailed further analysis or modelling is required.

Please note, that all relevant sections of the application must be fully completed, as insufficient information will result in your application being returned to you, which will result in your response being delayed.

Applicant Details

Please provide the full name, address and contact details of the person or company making the Pre-development enquiry.
All applications must be paid for prior to any response being answered. Please send your cheque, with the amount (including VAT), to Thames Water Limited with the accompanying fully completed application to:
Thames Water
Developer Services
Clearwater Court
Vastern Road
Reading
Berkshire RG1 8DB

Development site details

The site must hold a comprehensive address, scaled location plan and site layout (if available) which will assist in determining the location of proposed connection points.
A 12 figure grid reference highlighting the centre point of the site will also be helpful to us if an address is difficult to determine.
The type, number of units and size of the development will assist us.

We require information on the history of the site, therefore, if the site is Brownfield ie. land identified for redevelopment, then please let us know if the site has sewerage connections and what was previously occupying the site.

Proposed development and flows

Please indicate the proposed discharge rates for surface water and foul discharge in litres per second (l/s).

Checklist and declartion

Ensure that you have fully completed all relevant sections of the application. Please print your name, sign and date the application form and enclose:

- a scaled location plan
- a scaled site layout
- payment of the required fee of £398 + VAT

What happens next?

- Once we have received your fully completed application form we will provide you with the following response to your application:
- A preliminary assessment of any restrictions and potential connection points to the existing sewerage network.
- A preliminary assessment of any reinforcement works that will be required to service the development.
- Details of any protective measures for sewerage assets which may require diversion or easements.

We will endeavor to respond to you within 15 working days of receipt of your application providing it is not necessary to carry out further investigation works.

If further analysis is required, involving detailed modelling and site investigation (depth loggers, rain gauges or flow monitors) we are able to provide you with a scope, estimated cost and timeframe for undertaking a formal impact study for the price of £400 + VAT. Once completed this study would include a full report detailing the impact and recommendations/network improvements required to alleviate any increased flood risk.

Application for a pre-development enquiry

Please complete all sections of this form in BLOCK CAPITALS

About the person applying

This is the person we'll contact about the application and will recieve all correspondence. This can be the property owner or someone acting on their behalf.

Are you applying as? An individual ☐ or A company ☑

'An individual' is a homeowner and 'A company' is an agent/architect/builder etc acting on behalf of the homeowner

Company name GeoSmart Information Limited

Title Mr ☐ Mrs ☐ Ms ☐ Miss ☑ Dr. ☐ Other:

First name(s) Sam

Last name Cogan

Applicant contact details

We'll use these details to get in touch with you about your application.

Preferred contact number 01743 298 095

Alternative number 01743 298 095

Email address samcogan@geosmartinfo.co.uk

Full postal address

Address line 1: Suite 9-11

Address line 2: Old Bank Buildings, Bellstone

Town: Shrewsbury

County: Shropshire Postcode: SY1 1HU

Nominated contact

Who should we contact to process your application? Applicant ☑ Someone else ☐

(Please tick one)

If someone else:

Title Mr ☐ Mrs ☐ Ms ☐ Miss ☐ Dr. ☐ Other:

First name(s)

Continued...

Last name

Preferred contact number

Alternative number

Email address

Full postal address

Address line 1:

Address line 2:

Town:

County: Postcode:

Invoices

Who should we send invoices to? Applicant ☑ Nominated contact ☐ Someone else ☐

If someone else:

Title Mr ☐ Mrs ☐ Ms ☐ Miss ☐ Dr. ☐ Other:

First name(s)

Last name

Full postal address

Address line 1:

Address line 2:

Town:

County: Postcode:

Email address

Where the work is taking place

What is the address of the property being connected? Same as applicant ☐ Same as the nominated contact ☐ Somewhere else ☑

If somewhere else:

Site name 50 Redington Road,

Continued...

Full postal address

Address line 1: 50 Redington Road,

Address line 2:

Town: London

County: Postcode: NW3 7RS

About the site

What is your local authority? London Borough of Hillingdon

Ordance survey grid ref 525640 186083

What is the site currently used for? Greenfield/agricultural ☐ Industry ☐ Housing ☑ Landfill ☐ Other ☐

Site is currently a four bedroom residential house

VAT development classification

New build house or flat ☐ Relevant residential or charitable ☐

Commercial, existing or other ☐ Listed ☐ Conversion ☐ Mixed ☐

Location of existing connection

Does the site already have any of these sewerage connections?

Foul water Yes ☑ No ☐

If yes:

Current discharge rate 0.003 Litres per second

Size of existing site 1 unit. The Site is 0.064 hectares Number of units/hectares

Location of existing connection? Existing combined water sewer within Redington Road to the west of the Site.

Surface water Yes ☑ No ☐

If yes:

Current discharge rate 2.1 Litres per second

Size of existing site 1 unit. The Site is 0.064 hectares Number of units/hectares

Location of existing connection? Existing combined water sewer within Redington Road to the west of the Site.

Your proposed development

Type of development

Greenfield/agricultural ☐ Industry ☐ Housing ☑ Landfill ☐ Mixed ☐

Preferred foul water connection point

Existing combined water sewer within Redington Road to the west of the Site. Foul sewer flow will not increase

Preferred surface water connection point

Existing combined water sewer within Redington Road to the west of the Site

Size of proposed development

1 unit. The Site is 0.064 hectares Number of units/hectares

Proposed foul water discharge rate

0.003 Litres per second

Proposed surface water discharge rate

5 l/s (but upstream attenuation will be provided for a 1-2 l/s discharge rate. Litres per second

How will development flows reach the connection point?

Pumped ☐ Gravity ☑

Trade effluent agreement required?

Yes ☐ No ☐ Don't know ☑

If Yes, Trade effluent reference number

Planning status

Is the development identified in the local plan?

Yes ☐ No ☐ Don't know ☑ If Yes, reference number

Does the development have outlined planning permission?

Yes ☐ No ☑ Don't know ☐ If Yes, reference number

Does the development have full planning permission?

Yes ☐ No ☑ Don't know ☐ If Yes, reference number

Does the development have building regulation permission?

Yes ☐ No ☐ Don't know ☑

Enclose your documents

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

What we need from you to process your application:

Site plan	This should show the site with nearby buidlings, roads and any sewers.
Development plan	This should show propsed layout of new development buildings, roads and sewers.
Site drainage plan	This should show all propsed sewers, pipe sizes and gradients.

Checklist and Declaration

I have completed the application form and enclose the following information:

- Application fee of £398 + VAT
- A scaled location plan ie. site plans showing existing and proposed layouts.
- The development site drainage plan.

Declaration

I agree, that for the purpsoses of the Water Industry Act 2003 and the Data Protection Act 1998, the information provided in this form and in any accompanying documents, may be held on a computer and processed by Thames Water Ltd and its servants and agents for all purposes connected with the Company's statutory water and sewerage undertakings.

Print name	Sam Cogan
Position within company	Consultant
Company	GeoSmart Information Ltd
Date	07/03/2018
Signature	

Enclosed:

1. Site Location Plan
2. Development Plan
3. Asset Location Plan
4. SuDSmart Pro surface water calculations
5. Summary Foul Calculation Sheet

Getting in touch with us

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

thameswater.co.uk/developerservices

developer.services@thameswater.co.uk

0800 009 3921
Monday - Friday 8.00am-5.00pm

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

If you have any other questions for Thames Water

thameswater.co.uk

0800 980 8800

- Queries relating to your bill
- Change of address
- Meter readings

Minicom service if you are deaf or hard of hearing 0800 316 6899

0800 316 9800

- For emergencies
- Other non-billing enquiries
- Literature

Minicom service if you are deaf or hard of hearing 0800 316 9898

To contact us from abroad +44 1793 366011

Thames Water, PO Box 286, Swindon, SN38 2RA

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

12961I 04/15

Asset Location Search

Thames Water Property Searches
12 Vastern Road
READING
RG1 8DB

Search address supplied

50
Redington Road
London
NW3 7RS

Your reference P2092 50 Redington Road
Our reference ALS/ALS Standard/2011_2118696

Search date 8 November 2011

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

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
F 0118 923 6655/57
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

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

Asset Location Search

Search address supplied: 50, Redington Road, London, NW3 7RS

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.

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 0118 925 1504, or use the address below:

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

Tel: 0118 925 1504
Fax: 0118 923 6657

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

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Reading RG1 8DB

Asset Location Search

Waste Water Services

Please provide a copy extract from the public sewer map.

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

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

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

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

For your guidance:

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

Clean Water Services

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

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

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0845 920 0800. The Customer Centre can

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

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I www.thameswater-propertysearches.co.uk

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No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Asset Location Search

also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

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PO Box 3189
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Reading RG1 8DB

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, 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
Clear Water Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Fax: 0118 923 6613
Email: developer.services@thameswater.co.uk

Should you require any further information regarding budget estimates, diversions or stopping up notices then please contact:

DevCon Team
Asset Investment
Thames Water
Maple Lodge STW
Denham Way
Rickmansworth
Hertfordshire
WD3 9SQ

Tel: 01923 898 072
Fax: 01923 898 106
Email: devcon.team@thameswater.co.uk

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Clearwater Court, Vastern Road
Reading RG1 8DB

Asset Location Search

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact our Kew Service Desk by writing to:

Clean Water Design
Thames Water Utilities
1 Kew Bridge Road
Brentford
Middlesex
TW8 0EF

Tel: 0845 850 2777
Fax: 0208 213 8833
Email: developer.services@thameswater.co.uk

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
F 0118 923 6655/57
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

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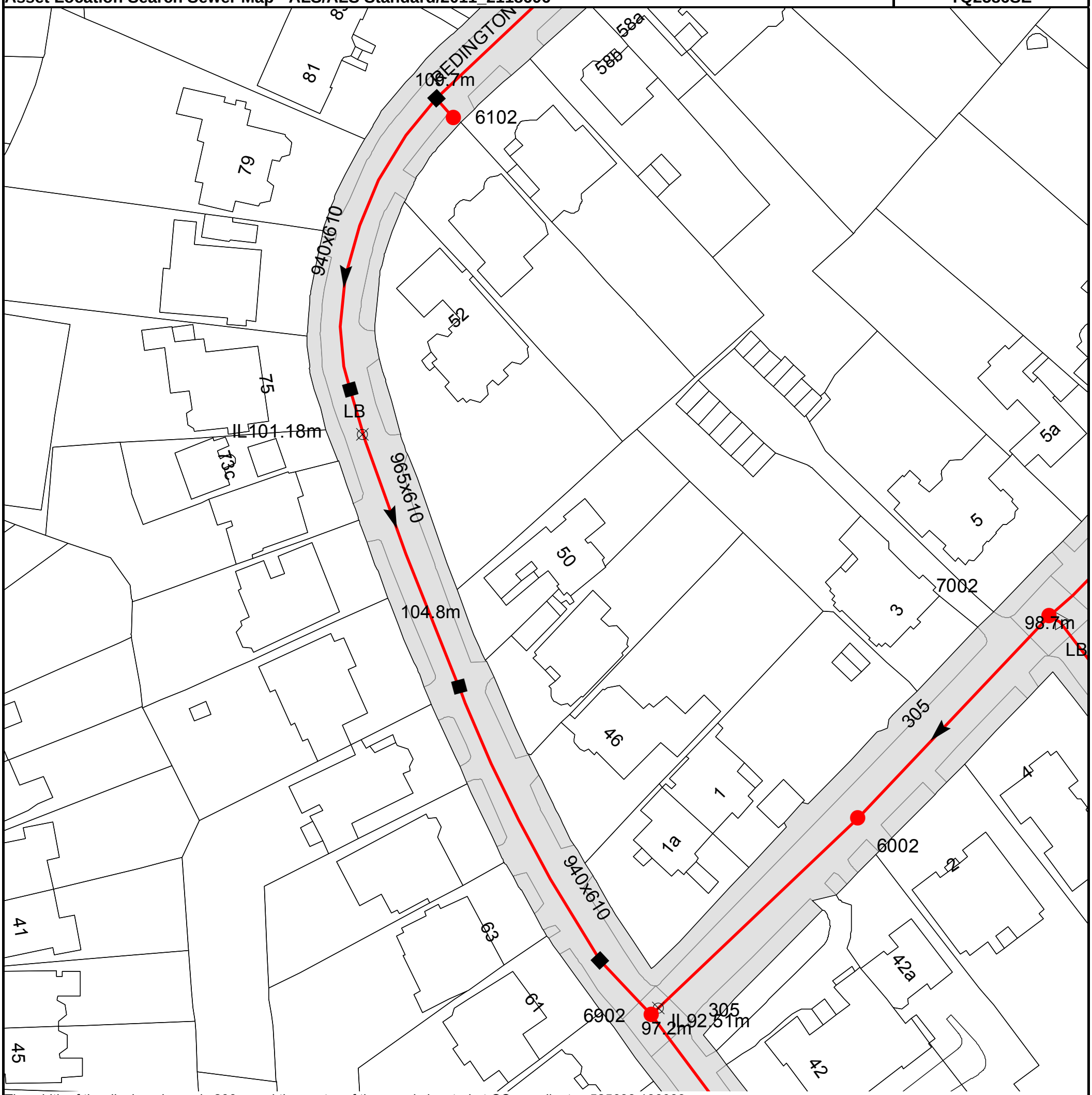
Reading RG1 8DB

Asset Location Search Sewer Map - ALS/ALS Standard/2011_2118696	TQ2586SE



The width of the displayed area is 200m and the centre of the map is located at OS coordinates 525638,186083

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
7002	99.08	94.25
6102	n/a	n/a
6902	97.3	91.98
-	-	-
6002	98.22	93.36

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

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

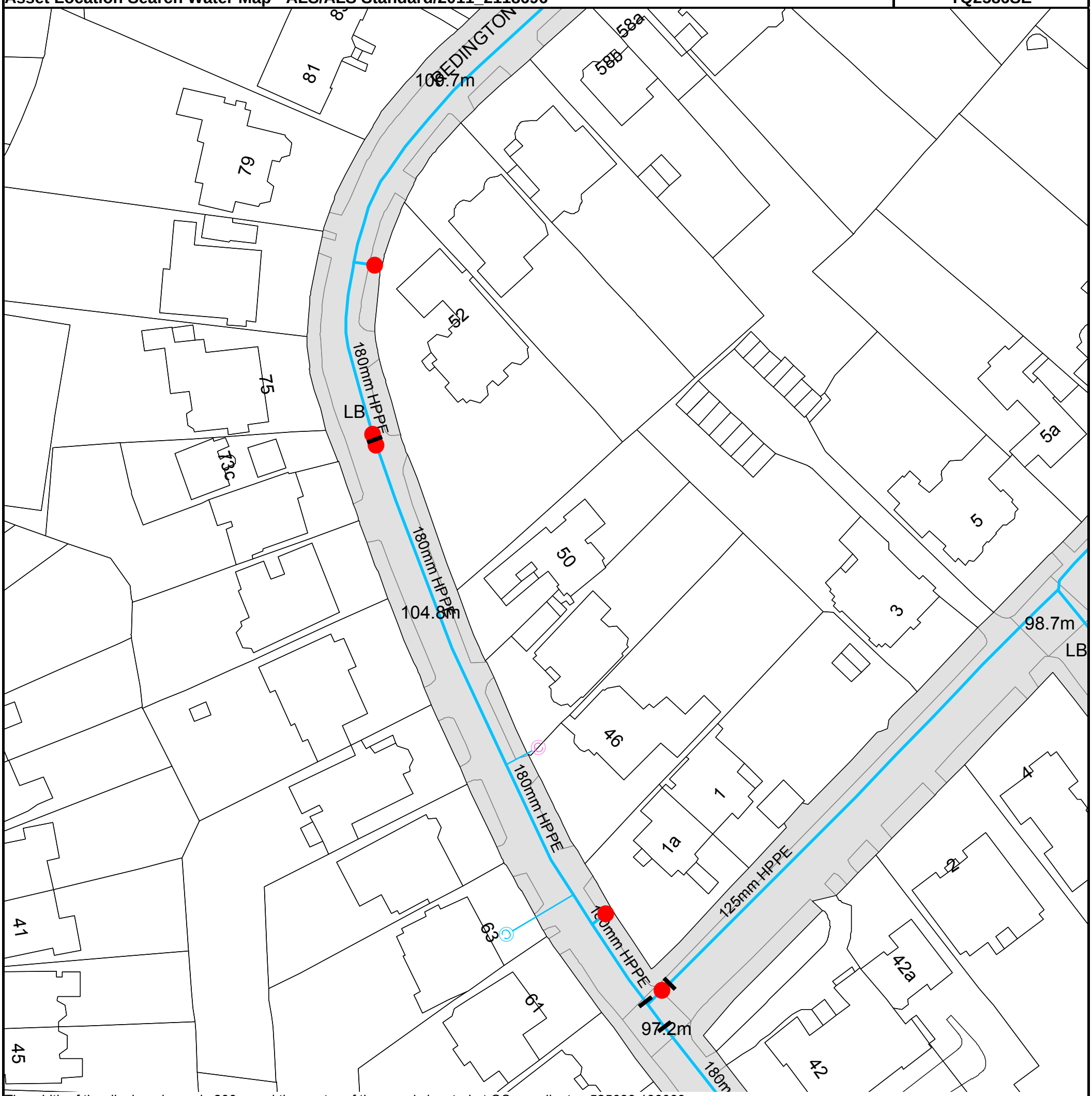
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Searches on 0118 925 1504.

Asset Location Search Water Map - ALS/ALS Standard/2011_2118696	TQ2586SE



The width of the displayed area is 200m and the centre of the map is located at OS coordinates 525638,186083

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

Property Type	No of Existing	No of Proposed
General Housing (per property - existing 2 persons, proposed 2 persons)*	1	1
Flat (per property - 2 persons)		
Primary School (per pupil)		
Senior School (per pupil)		
Boarding School (per pupil)		
Assembly Hall (per seat)		
Cinema (per seat)		
Sports Hall (per person)		
Hotel (per room)		
Guest House (per room)		
Motel (per room)		
Holiday Apartment (per person)		
Leisure Park (per person)		
Caravan Park standard (per space)		
Caravan Site serviced (per space)		
Camping site standard (per space)		
Camping site serviced (per space)		
Public House (per seat)		
Restaurant/Day Care Centre (per person)		
Drive in restaurant (per seat)		
Hospital (per bed)		
Nursing/Care Home (per bed)		
Offices (per m sq)		
Shopping Centre (per m sq)		
Warehouse (per m sq)		
Commercial premises (per m sq)		
Manufacturing unit (per m sq)		
Other (Please state units and description)		

One four bedroom house to one eight bedroom house*

Existing	Flow rate (l/p/d)	Flow (l/d/pd)	Flow (l/s)
General Housing (per property - 2 persons)	150	300	0.003
Existing TOTAL	150	300	0.003
Proposed	**Flow rate (l/p/d)**	**Flow (l/d/pd)**	**Flow (l/s)**
General Housing (per property - 2 persons)	150	300	0.003
Proposed TOTAL	150	300	0.003

*British Water sizing criteria (5 people per 3 bed unit and 1
additional person for each room.

**CIRIA PR72 and British Water Code of Practice (Flows and Loads – 4) Sizing Criteria, Treatment Capacity for Sewage Treatment Systems has been used as a guide to quantify foul flow per person per day and the flow in litres per second.

Greenfield Site Run-Off Calculations usng the IoH124 method

Greenfield peak run-off rate (QBAR):

Parameters	Input	Units	Comments
Area	50	ha	mimimum 50ha
SAAR	664	mm	FEH CD ROM (NERC, 2009)
SPR	0.47	N/A	Soil run-off coefficient
Region	6	N/A	Region on Hydrological area map

QBAR

$$Q_{BAR(rural)} = 1.08AREA^{0.89}SAAR^{1.17}SPR^{2.17}$$

Where:

$Q_{BAR(rural)}$	is the mean annual flood (a return period of 2.3 years) in l/s
AREA	is the area of the catchment in km² (minimum of 0.5km²)
SAAR	is the standard average rainfall for the period 1941 to 1970 in mm
SPR	is the soil run-off coefficient

$Q_{BAR(rural)}$ can be factored by the UK Flood Studies Report regional growth curves to produce peak flood flows for any return period.

$Q_{BAR(rural)}$	=	226.93	l/s for 50ha site
Divided by 50 to scale down	=	4.54	l/s/ha
Actual Area of the entire Site	=	0.06	ha

Return Periods (Growth curves obtained from DEFRA report)

Return Period		Growth Factor	l/s/ha	Peak site run-off rate (l/s)
1	**$Q_{BAR(rural)}$ x**	**0.85**	**3.86**	**0.241**
2	$Q_{BAR(rural)}$ x	0.88	3.99	0.25
5	$Q_{BAR(rural)}$ x	1.28	5.81	0.36
10	$Q_{BAR(rural)}$ x	1.62	7.35	0.46
25	$Q_{BAR(rural)}$ x	2.14	9.71	0.61
30	**$Q_{BAR(rural)}$ x**	**2.24**	**10.17**	**0.634**
50	$Q_{BAR(rural)}$ x	2.62	11.89	0.74
100	**$Q_{BAR(rural)}$ x**	**3.19**	**14.48**	**0.90**
200	$Q_{BAR(rural)}$ x	3.86	17.52	1.09

Greenfield total run-off volume:

= actual area of the entire site x SPR x 6 hour rainfall depth

Return Period	6 hour rainfall (mm) from FEH CD-ROM	Area (ha)	SPR	Total run-off (m^3)
2.3 (QBAR)	28.94	0.06	0.47	8.5
1	26.86	0.06	0.47	7.9
10	48.12	0.06	0.47	14.1
30	64.58	0.06	0.47	18.9
100	90.43	0.06	0.47	26.5

Summary

Entire site area:	0.062	ha		
Climate Change Factor	30%			
	Current		*Proposed*	
Permeable Surface (ha)	0.022		0.020	
Impermeable Surface (ha)	0.041		0.042	

1 in 1 year

Greenfield run-off volume total:	7.88	m^3		
RUN-OFF During a 1 in 1 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	7.88	2.76	2.55	3.32
From impermeable surfaces (m^3)		10.88	11.33	14.74
TOTAL run-off produced from Site (m^3)	7.88	13.64	13.89	18.05

Difference between greenfield site and proposed +cc development (m^3):	**10.17**
	129%
Difference between current and proposed +cc development (m^3):	**4.41**
	32%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.24**

1 in 10 year

Greenfield run-off volume total:	14.11	m^3		
RUN-OFF During a 1 in 1 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	14.11	4.95	4.57	5.94
From impermeable surfaces (m^3)		18.95	19.74	25.66
TOTAL run-off produced from Site (m^3)	14.11	23.90	24.31	31.60

Difference between greenfield site and proposed +cc development (m^3):	**17.49**
	124%
Difference between current and proposed +cc development (m^3):	**7.70**
	32%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.46**

1 in 30 year

Greenfield run-off volume total:	18.94	m^3		
RUN-OFF During a 1 in 30 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	18.94	6.65	6.13	7.97
From impermeable surfaces (m^3)		26.15	27.25	35.43
TOTAL run-off produced from Site (m^3)	18.94	32.80	33.38	43.40

Difference between greenfield site and proposed +cc development (m^3):	**24.46**
	129%
Difference between current and proposed +cc development (m^3):	**10.60**
	32%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.63**

1 in 100 year

Greenfield run-off volume total:	26.52	m^3		
RUN-OFF During a 1 in 100 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	26.52	9.31	8.59	11.16
From impermeable surfaces (m^3)		36.62	38.16	49.61
TOTAL run-off produced from Site (m^3)	26.52	45.93	46.75	60.77

Difference between greenfield site and proposed +cc development (m^3):	**34.25**
	129%
Difference between current and proposed +cc development (m^3):	**14.84**
	32%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.90**

Critical Storm Duration and volume requirements

The table below presents storage volumes for the 1 in 100 year plus climate change (40%) used to assess the impact of the proposed development and calculate the required storage volumes for the critical storm duration for attenuation features, limited to a maximum discharge rate of 5 l/s (requested run-off rate with Thames Water).

Table 5: Critical Storm Durations and storage requirements associated with the development

Rainfall event duration (Hours)	Outflow to 5 l/s (m^3)	Inflow from impermeable surfaces (m^3)	Storage Required for Critical Storm Duration (m^3)
0.25	4.50	17.90	13.40
0.5	9.00	22.98	13.98
0.75	13.50	25.95	12.45
1	18.00	28.06	10.06
2	36.00	36.11	0.11
3	54.00	41.22	0

Critical Storm Duration and volume requirements

The table below presents storage volumes for the 1 in 100 year plus climate change (40%) used to assess the impact of the proposed development and calculate the required storage volumes for the critical storm duration for attenuation features, limited to a maximum discharge rate of 1 l/s.

Table 5: Critical Storm Durations and storage requirements associated with the development

Rainfall event duration (Hours)	Outflow to 1 l/s (m^3)	Inflow from impermeable surfaces (m^3)	Storage Required for Critical Storm Duration (m^3)
0.25	0.90	17.90	17.00
0.5	1.80	22.98	21.18
0.75	2.70	25.95	23.25
1	3.60	28.06	24.46
2	7.20	36.11	28.91
3	10.80	41.22	30.42
4	14.40	44.84	30.44
5	18.00	47.54	29.54
6	21.60	49.61	28.01
8	28.80	52.46	23.66
10	36.00	54.43	18.43
12	43.20	55.91	12.71
16	57.60	58.05	0.45
20	72.00	59.48	0