Chalton Street & Churchway, London

Drainage Strategy

Summer 2018 Update

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DOCUMENT VERIFICATION RECORD

CLIENT:	Rangepay Ltd
SCHEME:	Proposed hotel and residential development at Chalton Street & Churchway, London – Drainage Strategy
INSTRUCTION:	The instruction to carry out this Drainage Strategy was received from David Cunningham of Divine Ideas (UK) Ltd on behalf of Rangepay Ltd.

DOCUMENT REVIEW & APPROVAL

AUTHOR:	Adam Parkinson BSc (Hons)
CHECKER:	Andrew Russell BEng (Hons)
APPROVER:	Aled Williams BSc (Hons) MCIWEM

ISSUE HISTORY

ISSUE DATE	COMMENTS
23/03/2017	First issue
13/08/2018	Second issue – Updated to account for revised development plans

Contents

Appendices

Tables

Introduction

Waterco Consultants have been commissioned to undertake a Drainage Strategy in relation to a proposed hotel and residential development at 53-55 Chalton Street, 60 Churchway and 70 Churchway, London NW1 1HY / NW1 1LT.

From April 2015, the London Borough of Camden as a Lead Local Flood Authority (LLFA), is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all planning applications are accompanied by a Sustainable Drainage Strategy. The aim of the Sustainable Drainage Strategy is to identify water management measures, including sustainable drainage systems (SuDS), to provide surface water runoff reduction and treatment.

Planning Policy

The London Plan

The site is located within the London Borough of Camden, which is covered by The London Plan (Adopted 2011, updated March 2015). The London Plan contains the following policy pertaining to drainage:

Policy 5.13 – Sustainable Drainage

A. *Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:*
    1. *store rainwater for later use*
    2. *use infiltration techniques, such as porous surfaces in non-clay areas*
    3. *attenuate rainwater in ponds or open water features for gradual release*
    4. *attenuate rainwater by storing in tanks or sealed water features for gradual release*
    5. *discharge rainwater direct to a watercourse*
    6. *discharge rainwater to a surface water sewer/drain*
    7. *discharge rainwater to the combined sewer.*

Drainage should be designed and implemented in ways that deliver other policy objectives of the Plan, including water use efficiency and quality, biodiversity, amenity and recreation".

The London Plan is supported by the Supplementary Planning Guidance: Sustainable Design and Construction, April 2014. In relation to Surface Water Flooding and Sustainable Drainage, the guidance states that *'developers should design SuDS that incorporate attenuation for surface water runoff. The minimum expectation is to achieve 50% attenuation of the undeveloped site's surface water runoff at peak times. The Mayor's priority is to achieve greenfield runoff rates. Development on greenfield sites must maintain a greenfield runoff rate. Development on previously developed sites should have a runoff rate no greater than three times the calculated greenfield runoff rate'*.

Local Policy

The London Borough of Camden's 'Camden Local Plan' (July 2017) has replaced the Camden Core Strategy and the Camden Development Policies (2010) and contains the following policies relating to drainage:

Policy D1 Design

The Council will seek to secure high quality design in development. The Council will require that development:

c. *is sustainable in design and construction, incorporating best practice in resource management and climate change mitigation and adaptation;*

Policy CC2 Adapting to Climate Change

The Council will require development to be resilient to climate change. All development should adopt appropriate climate change adaptation measures such as:

a. *the protection of existing green spaces and promoting new appropriate green infrastructure;*
b. *not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems;*
c. *incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and*
d. *measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.*

Any development involving 5 or more residential units or 500 sqm or more of any additional floorspace is required to demonstrate the above in a Sustainability Statement.

Sustainable Design and Construction Measures

The Council will promote and measure sustainable design and construction by:

e. *ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;*
f. *encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;*
g. *encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve "excellent" in BREEAM domestic refurbishment; and*
h. *expecting non-domestic developments of 500 sqm of floorspace or above to achieve "excellent" in BREEAM assessments and encouraging zero carbon in new development from 2019.*

Policy CC3 Water and Flooding

The Council will seek to ensure that development does not increase flood risk and reduces the risk of flooding where possible. We will require development to:

a. *incorporate water efficiency measures;*
b. *avoid harm to the water environment and improve water quality;*
c. *consider the impact of development in areas at risk of flooding (including drainage);*
d. *incorporate flood resilient measures in areas prone to flooding;*
e. *utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible; and*
f. *not locate vulnerable development in flood-prone areas.*

Where an assessment of flood risk is required, developments should consider surface water flooding in detail and groundwater flooding where applicable.

The Council will protect the borough's existing drinking water and foul water infrastructure, including the reservoirs at Barrow Hill, Hampstead Heath, Highgate and Kidderpore.

The London Borough of Camden have produced the Camden Planning Guidance 3 – Sustainability which indicates the council expects the following with regards to surface water flooding:

All developments are expected to manage drainage and surface water on-site or as close to the site as possible, using Sustainable Drainage Systems (SuDS).

The Council will expect plans and application documents to describe how water will be managed within the development, including an explanation of the proposed SuDS, the reason why certain SuDS have been ruled out and detailed information on materials and landscaping.

The Council will expect developments to achieve a greenfield surface water run-off rate once SuDS have been installed. As a minimum, surface water run-off rates should be reduced by 50% across the development.

Existing Conditions

The 553m^2 development site is located at Chalton Street and Churchway, London (National Grid Reference: 529786, 182835). A location plan and an aerial image are included in Appendix A.

The existing land use for 53-55 Chalton and 60 Churchway currently comprises of ground floor retail and two storeys of residential use. A basement floor is currently used for storage and office accommodation. The land at 70 Churchway currently comprises a two-storey building with a basement level. The existing use of 70 Churchway is unknown.

The site is within a predominantly residential and commercial land use area. Access to the site is provided from Churchway to the west and north and Chalton Street to the east.

The site is currently occupied by approximately 553m² (100% of the total site area) of hard standing in the form of building cover.

Local Topography

A topographical survey of 53-55 Chalton and 60 Churchway has been undertaken by Hook Survey Partnership in July 2014 and is included as Appendix B. The topographical survey shows that the basement level of the site is situated at 16.77metres Above Ordnance Datum (m AOD) and the ground floor unit has a split level of 19.49m AOD and 18.72 AOD. No topographical levels have been provided for 70 Churchway.

Ground Conditions

Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is underlain by bedrock deposits consisting of the London Clay Formation which is generally described as comprising Clay, Silt and Sand.

BGS borehole scans identify a borehole located approximately 40m north-west of the site (BGS ref. TQ28SE348). The borehole indicates Made Ground down to 0.6m below ground level (m. bgl). The Made Ground is underlain by soft to firm brown clay down to 2.1m bgl. This is underlain by stiff to very stiff fissured grey silty clay associated with the London Clay Formation down to 19.8m bgl, which is underlain by very stiff to hard fissured mottled blue, brown and red silty or sandy clay associated with the Woolwich and Reading Beds down to 32.9m bgl. This is underlain by dense grey clayey fine to medium sand down to the borehole base of 36.5 m bgl.

According to the Environment Agency's online Groundwater Vulnerability Mapping, the London Clay Formation is classified as Unproductive Strata. Unproductive Strata is described as rock layers with low permeability that have negligible significance for water supply or river base flow.

The Environment Agency's online groundwater Source Protection Zone map indicates that the site is not located within a groundwater Source Protection Zone.

The soil is described as 'slowly permeable seasonally wet loamy and clayey soils' by the National Soil Resources Institute.

Local Drainage

Public sewer records have been requested from Thames Water and are included as Appendix C. The Thames Water Sewer records show that a 305mm diameter combined sewer trends in a north westerly direction within Churchway. The 305mm combined sewer drains into a 1245mm x 813mm public combined sewer originating from Doric Way, ultimately draining into a 1168m x 686mm combined sewer trending in a south easterly direction in Chalton Street. The 305mm public combined sewer immediately south-west of the site has an identified invert level of 16.32m AOD.

Foul and surface water from the site currently discharge to the public combined sewer network. An existing public combined sewer is shown beneath 70 Churchway and serves the existing building.

Development Proposals

The proposed development is for a hotel and residential units. The hotel development covers 430m^2 and comprises a four-storey hotel with a basement level and an associated bar, restaurant and hotel reception on the first floor.

The residential development covers 122m^2 and comprises a four-storey block comprising a 2-bed apartment and 2No. 1-bed apartments. The 2-bed apartment will occupy the basement and ground floor (with sleeping accommodation at ground floor level) and includes an enclosed garden area. Development plans are included in Appendix B.

The proposed development will not increase hardstanding areas across the site. The hotel development site will remain entirely occupied by building cover. The residential site will introduce approximately 21m^2 of permeable area in the form of an enclosed garden (4% of the total area).

Surface Water Management

The site is currently 100% hardstanding comprising residential and retail buildings. Surface water runoff currently drains at an unrestricted rate to the public combined sewer.

The proposed development plans indicate that building cover will occupy 96% of the site. Therefore, there is limited space available for the inclusion of surface water attenuation features within the proposed development. The development will reduce the amount of impermeable area through the introduction of a 21m² garden. Therefore, surface water runoff rates and volumes will reduce as a result of the development.

Discharge Method

Paragraph 080 of the NPPG: Flood Risk and Coastal Change sets out the following hierarchy of drainage options: into the ground (infiltration); to a surface water body; to a surface water sewer, highway drain or another drainage system; to a combined sewer.

Infiltration

The first consideration for the disposal of surface water is infiltration. As described above the site is underlain by the London Clay Formation. Therefore, ground conditions do not appear suitable for the use of soakaways.

In accordance with Building regulation, soakaways should be a minimum of 5m away from buildings. The proposed buildings will occupy 96% of the site with the proposed garden (21m^2) being within 5m of buildings. As such there is insufficient space to accommodate soakaways. Permeable surfaces will be used within the garden area.

Watercourse

Where soakaways are not suitable, connection to a watercourse is the next consideration.

There are no watercourses located in the immediate vicinity of the site. The nearest watercourse is the River Thames which is located approximately 2km south-east of the site. The site is separated from the River Thames by third party, urbanised land. A direct connection to this watercourse is therefore not a feasible option.

Sewer

As disposal of surface water to watercourse is not possible, a connection to the public sewer system is the final consideration. There is a 305mm public combined sewer located in Churchway south-west of the site, and a 1245mm x 813mm combined sewer located in Churchway, north of the site (with an existing connection from 70 Churchway). There is also a 1168mm x 686mm combined sewer in Chalton Street east of the site. Surface water should discharge to the public sewer network as per the existing situation, subject to agreement with Thames Water. A gravity connection appears feasible. Existing connections could be re-used subject to survey of their condition.

Sustainable Drainage Systems

Sustainable Drainage Systems (SuDS) should be included where practical to provide surface water runoff reduction and treatment. The following SuDS options have been considered:

Swales, detention basins and ponds

Due to the nature of the proposed development with building cover occupying 96% of the site area, the use of swales, detention basins and ponds for surface water storage would not be feasible due to the lack of available open space.

Rainwater Harvesting

The attenuation benefits provided through the use of rainwater harvesting are considered to be limited, and would only be realised when the tanks were not full. Rainwater harvesting techniques

could be considered within the final design, however there is limited space on-site to incorporate a rainwater harvesting tank.

Green Roofs

A partial green roof is proposed for the hotel development (53-55 Chalton and 60 Churchway). Green roofs will provide an element of surface water runoff and volume reduction, especially during storm events occurring in dry summer months.

Porous / Permeable Paving

Due to the nature of the proposed development with building cover occupying the majority of the site area, there is limited potential to incorporate porous / permeable paving. Any paving incorporated within the garden area will be porous.

Underground Attenuation Tanks

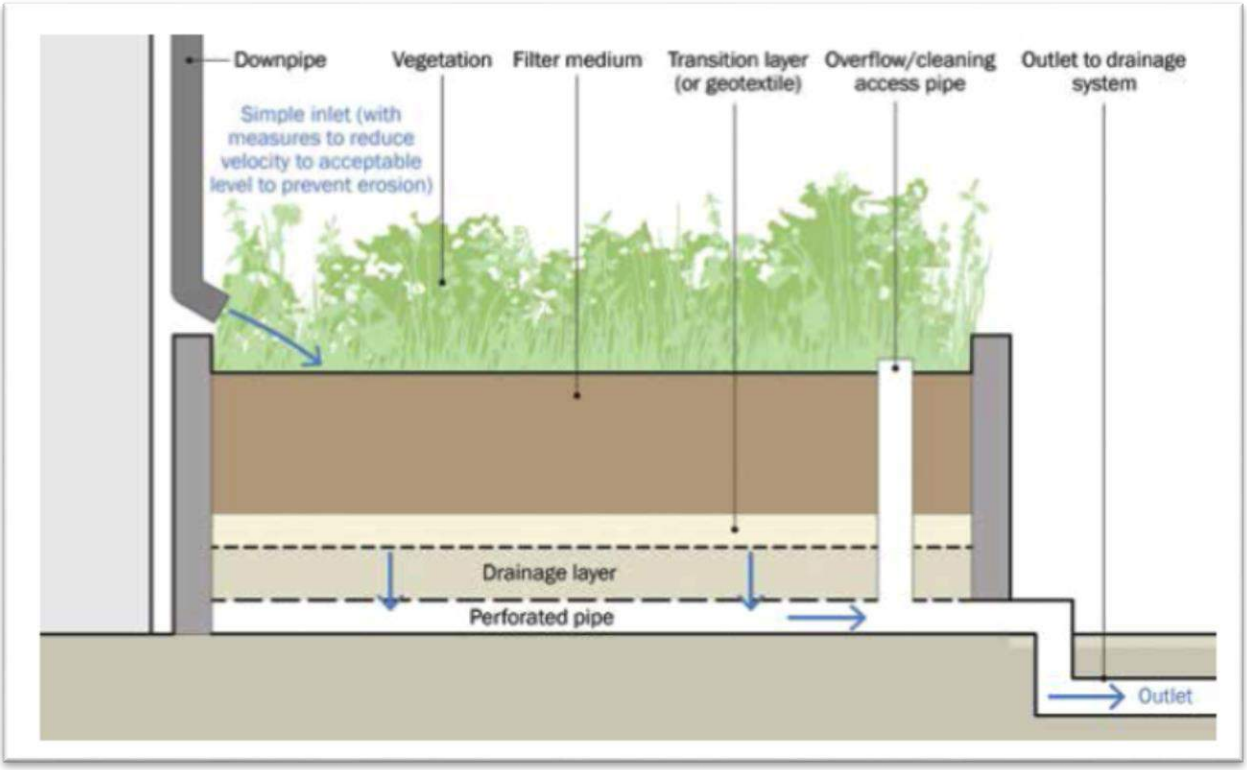
Development proposals indicate that the majority of the site will be occupied by building cover, including a basement level. As such there is insufficient space to accommodate a below ground attenuation tank or oversized pipes.

Other SuDS Options

The developer should consider the use of raised (box) planters on rainwater downpipes. Raised planters may not be possible on building frontages as they would extend onto adjacent pavements, however planters could be incorporated within the proposed garden if downpipes are to be located in this area.

Raised (box) planters are constructed above the surrounding ground surface, with a planted soil mix and an underdrain to collect filtrated water. Runoff rates are reduced through the filtration process and runoff volume reduced through uptake by plants. It should be noted that due to the size of the garden area, run-off rate and volume reduction will be limited and the box planter cannot accommodate for surface water runoff from the entire development.

A typical cross section through a raised (box) planter, extracted from the SuDS Manual (2015), is provided below for reference:



SuDS Manual (2015) – 'Figure 18.5 Section through a raised planter'

The outlet from the planter(s) should be discharged to the public sewer.

Concept Surface Water Drainage Scheme

Surface water runoff will be discharged to the public combined sewer system as per the existing situation. Due to the space constraints identified within the development plans there is no potential for surface water attenuation on site.

A number of SuDS options have been reviewed and due to the majority of the site area being occupied by buildings, SuDS, which provide significant attenuation storage i.e. pond, basins and below ground tanks, are not considered to be feasible. However, raised (box) planters could be incorporated in the proposed garden area and partial green roofs are proposed.

As there is a reduction in hard-standing when compared to the existing scenario, the proposed development will not increase surface water runoff rates and will not increase flood risk elsewhere.

Surface Water Treatment

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), other roofs (applicable to hotel roofs) are be categorised as having a 'low' pollution hazard level. Table 1 shows the pollution hazard indices for the land use.

Table 1 – Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other roofs (typical commercial/industrial roofs)	Low	0.3	0.2	0.05

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2
** Indices values range from 0-1.*

Given the low pollution hazard level associated with hotel roofs and that discharge will be made to the public combined sewer, surface water treatment devices are not considered necessary.

Maintenance

Maintenance of private drainage features such as raised planters will be the responsibility of individual property owners. Maintenance of a raised (box) planter will entail vegetation management and reducing soil compaction i.e. through regular turning of the soil.

Foul Drainage

Foul flows from the hotel development should be discharged to the public combined sewer network as per the existing situation. Based on the basement floor level of 16.77m AOD, a gravity connection to the public sewer network appears feasible. A non-return valve should be fitted prior to the sewer connection point to prevent backflow. Foul flows from the residential development should connect to the public combined sewer located within 70 Churchway as per the existing situation.

Conclusions

The aim of the Sustainable Drainage Strategy is to identify water management measures to reduce surface water runoff, including sustainable drainage systems (SuDS). This report has been produced in accordance with the guidance detailed in the CIRIA SuDS manual (C753) and the London Plan.

The proposed development will lead to a reduction in impermeable area. Therefore, the development will not result in an increase in surface water runoff. As the building cover will occupy the majority of the site, surface water attenuation features are not considered feasible due to insufficient space. Raised box planters could be accommodated within the garden if downpipes are located in this area. A partial green roof is also proposed.

All methods of surface water discharge have been assessed. Discharge of surface water to the public sewer network, as per the existing situation, appears to be the only suitable option.

Foul flows should be discharged to the public sewer network as per the existing situation. Based on the floor level of the basement within the hotel development, a gravity connection appears to be feasible.

Recommendations

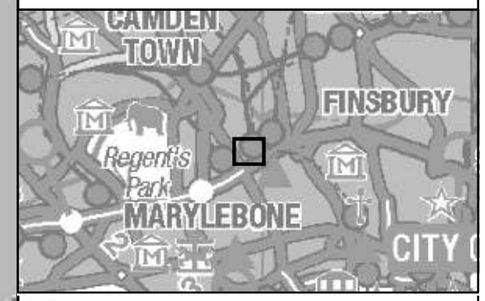
1. Submit this Drainage Strategy to the Planning Authority in support of the Planning Application;
2. Consult Thames Water over re-using connections to the sewer.

Appendix A – Location Plan & Aerial Image

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary



CLIENT:
RANGEPAY LTD

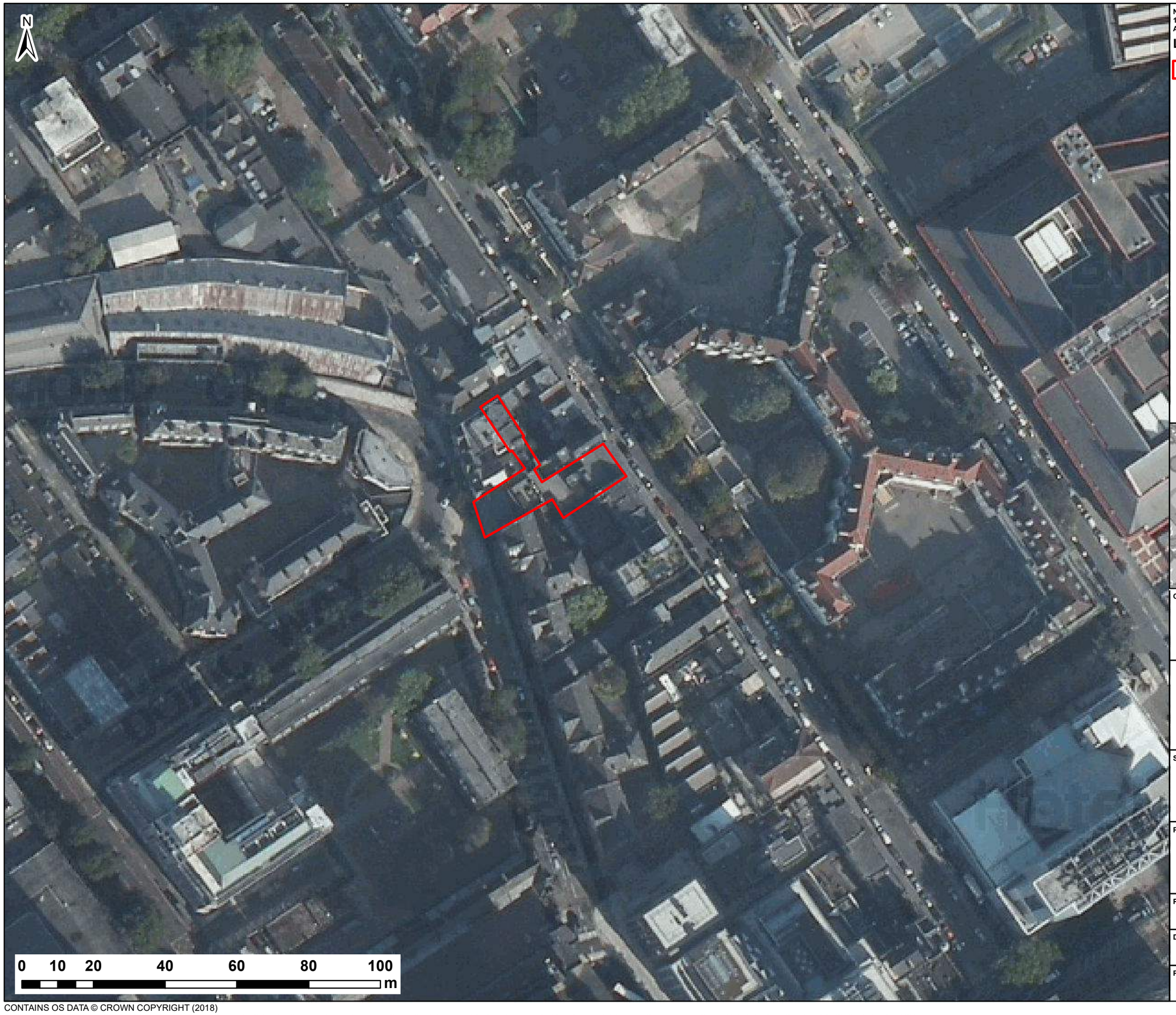
waterco consultants
www.waterco.co.uk

SCHEME:
CHALTON ST & CHURCHWAY, LONDON

PLOT TITLE:
LOCATION PLAN

PLOT STATUS:			DATE:
FINAL			02/08/2018
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
HW	AW	VG	1:1,500 (UNLESS STATED OTHERWISE)

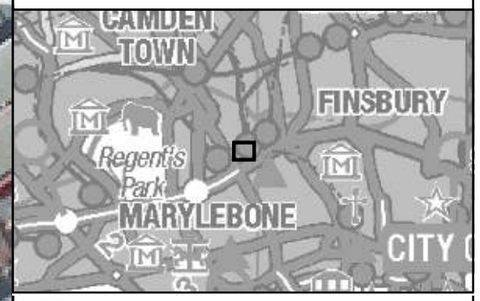
PLOT NAME:	REV:
w10253-Location_Plan	-



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary



CLIENT:

RANGEPAY LTD

waterco consultants

www.waterco.co.uk

SCHEME:

CHALTON ST & CHURCHWAY, LONDON

PLOT TITLE:

AERIAL PLAN

PLOT STATUS:	DATE:
FINAL	02/08/2018

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
HW	AW	VG	1:1,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w10253-Aerial_Plan	-

Appendix B – Development Plans & Topographical Survey

Appendix C – Thames Water Sewer Plan

Asset Location Search

Waterco Ltd

RUTHIN
LL15 1NJ

Search address supplied

Chalton Street & Churchway
60
Churchway
London
London
NW1 1LT

Your reference w10253

Our reference ALS/ALS Standard/2017_3517388

Search date 1 March 2017

Notification of Price Changes…

From **1 September 2016** Thames Water Property Searches will be increasing the prices of its Asset Location Searches. This will be the first price rise in three years and is in line with the RPI at 1.84%. The increase follows significant capital investment in improving our systems and infrastructure.

Enquiries received with a higher payment prior to 1 September 2016 will be non-refundable. For further details on the price increase please visit our website at

www.thameswater-propertysearches.co.uk

Asset Location Search

Search address supplied: Chalton Street & Churchway, 60, Churchway, London, London, NW1 1LT

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

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

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

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

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

Asset Location Search

Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

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

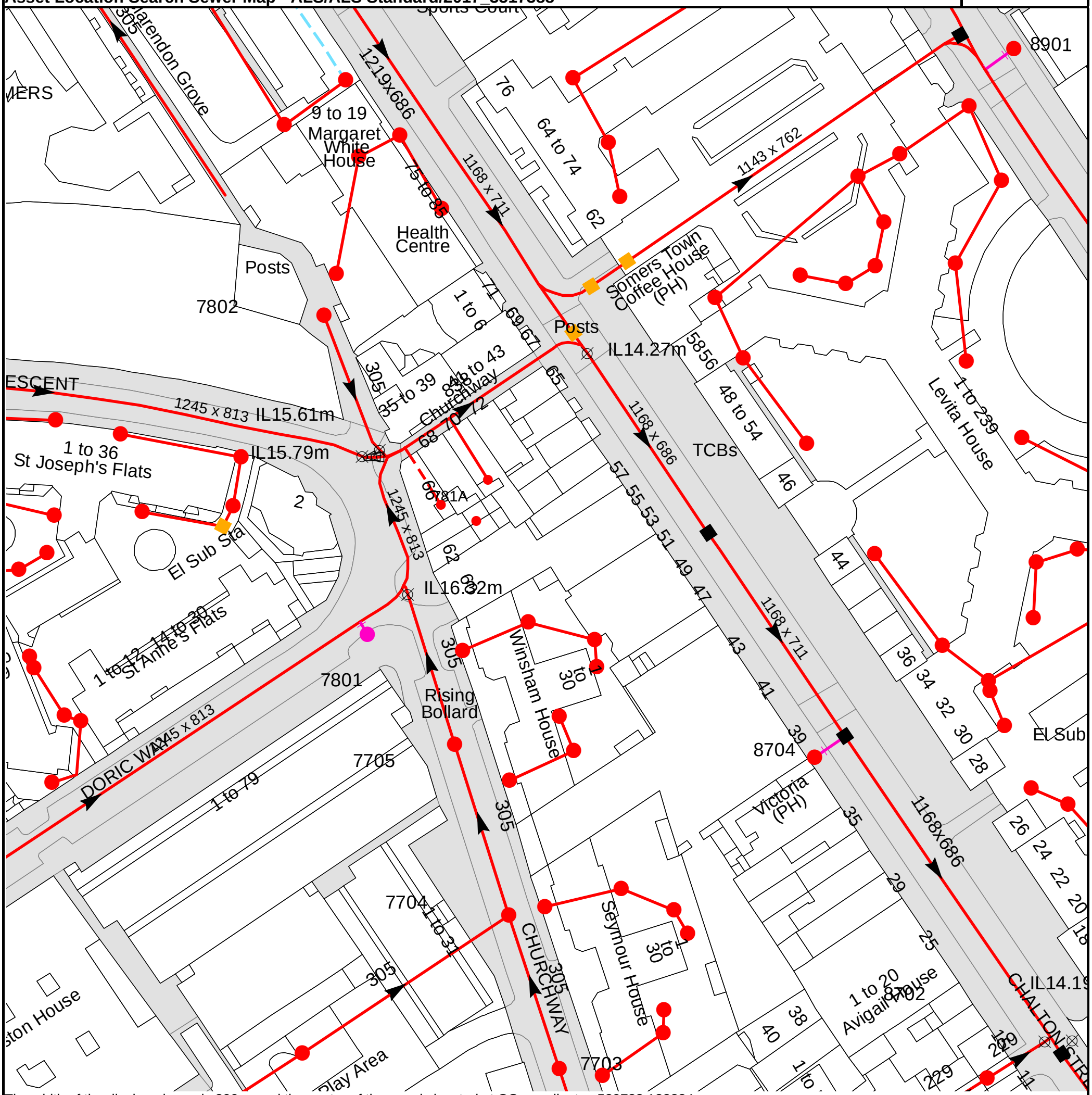
Clean Water queries

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

Asset Location Search Sewer Map - ALS/ALS Standard/2017_3517388



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 529783,182834

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8702	20.21	17.28
77BC	n/a	n/a
7703	21.08	17.39
87DA	n/a	n/a
87CJ	n/a	n/a
87CH	n/a	n/a
7704	20.29	16.86
87CI	n/a	n/a
77BB	n/a	n/a
77BA	n/a	n/a
87BI	n/a	n/a
87BH	n/a	n/a
77AH	n/a	n/a
8704	n/a	n/a
77AG	n/a	n/a
7705	19.28	16.61
88BE	n/a	n/a
78EF	n/a	n/a
88BF	n/a	n/a
88BD	n/a	n/a
78EA	n/a	n/a
78ED	n/a	n/a
88AD	n/a	n/a
78EB	n/a	n/a
78EC	n/a	n/a
88CG	n/a	n/a
88CH	n/a	n/a
88AC	n/a	n/a
88CI	n/a	n/a
78CJ	n/a	n/a
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89BE	n/a	n/a
89BB	n/a	n/a
79BF	n/a	n/a
89BC	n/a	n/a
79BG	n/a	n/a
8901	n/a	n/a
68FA	n/a	n/a
78EJ	n/a	n/a
78FB	n/a	n/a
78EI	n/a	n/a
78EH	n/a	n/a
68FE	n/a	n/a
7802	18.62	16.39
78CH	n/a	n/a
79BI	n/a	n/a
79BH	n/a	n/a
79AF	n/a	n/a
79BA	n/a	n/a
7702	20.59	17.47
67BC	n/a	n/a
68EA	n/a	n/a
68DJ	n/a	n/a
68DI	n/a	n/a
68DH	n/a	n/a
7801	19.03	n/a
68DE	n/a	n/a
68DD	n/a	n/a

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

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

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

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

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

2) All measurements on the plans are metric.

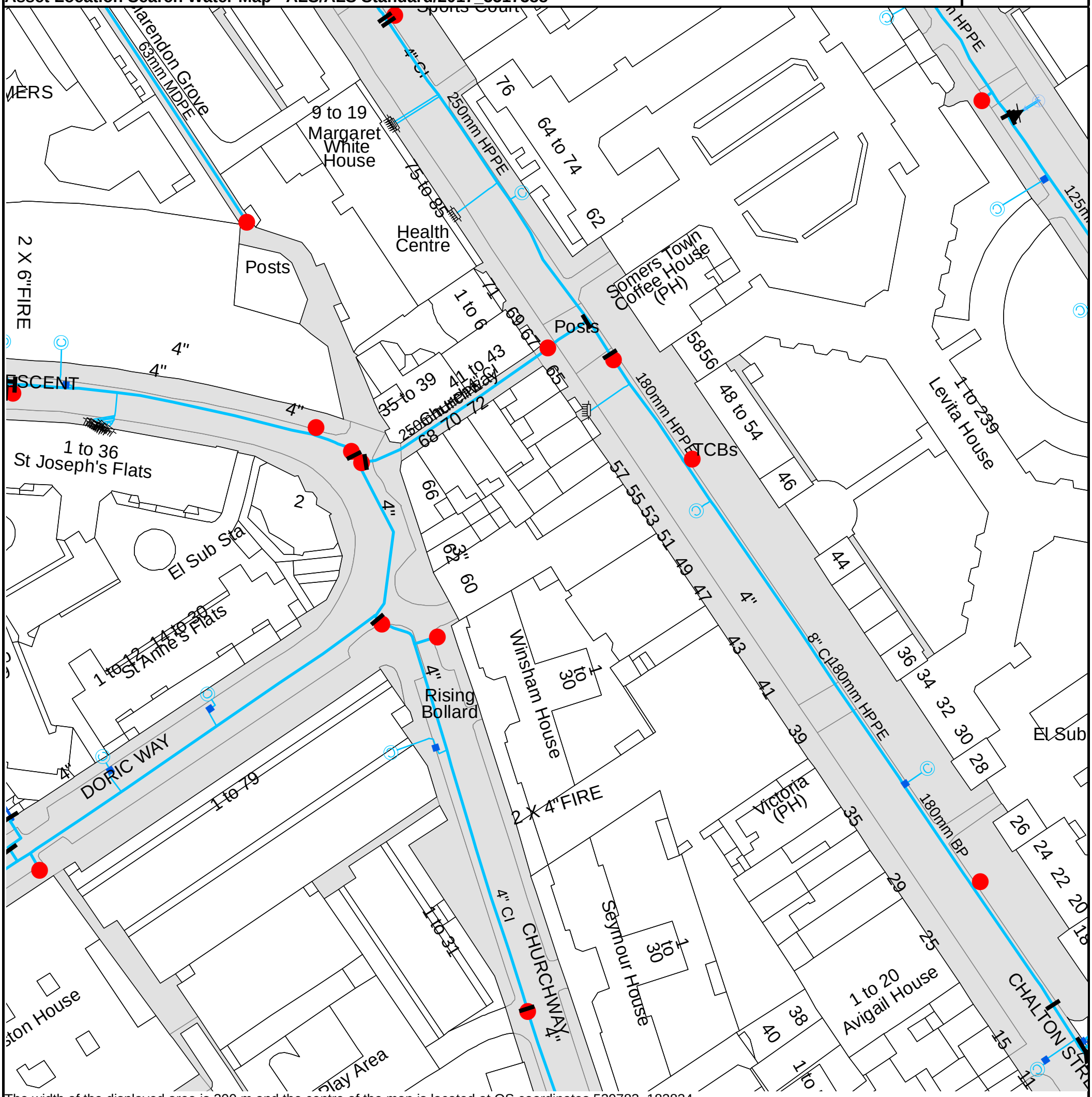
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

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

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

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2017_3517388



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 529783, 182834.

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 Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

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

Hydrants

- Single Hydrant

Meters

- Meter

End Items

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

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

Operational Sites

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

Other Symbols

- Data Logger

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

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

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

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

Terms and Conditions

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

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

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

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

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to 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**

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:

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- 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.

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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