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Appendix A.1 – Drawings

REV.	DATE	REVISIONS:	BY	REV.	DATE	REVISIONS:	BY	REV.	DATE	REVISIONS:	BY	STATUS:

CLIENT:	Mr. D Wells	PROJECT:	South Worple Way East Sheen
SCALE:	1:200 (A1 ORIGINAL)	DRAWING:	Site Survey
DRAWN: AL DATE: 19.09.2018	18150	S202	-

OSP
architecture planning masterplanning

Broadmede House, Farnham Business Park,
Weydon Lane, Farnham, Surrey GU9 8QT.
info@osparchitecture.com www.osparchitecture.com
Tel: 01252 267878

This drawing may be scaled or cross referenced to the scale bar for planning application purposes only. Do not scale for any other purpose, use figured dimensions only. Subject to site survey and all necessary consents. All dimensions to be checked by user and any discrepancies, errors or omissions to be reported to the Architect before work commences. This drawing is to be read in conjunction with all other relevant materials.

N
W E
S

0 1m 4m 8m

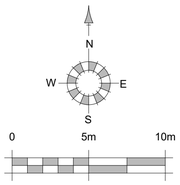
Coloured Site Layout

South Worple Way, East Sheen

18150 / C201A

Scale 1:200 @ A1 September 2019

OSP Architecture, Broadmede House, Farnham Business Park, Weydon Lane, Farnham, Surrey, GU9 8QT Tel: 01252 267878
www.osparchitecture.com



Site Plan Legend

- Application Site Boundary Line
- Plot 00 — Plot Number
- 1-1 — Parking Allocation
- Timber Fence
- Brick Wall
- Existing Building to be demolished

LANDSCAPING DETAILS

- Proposed Trees
- Proposed Shrubs

REV.	DATE	REVISIONS:	BY	REV.	DATE	REVISIONS:	BY	REV.	DATE	REVISIONS:	BY	STATUS:

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CLIENT:	Mr. D Wells	PROJECT:	South Worple Way, East Sheen
SCALE:	1:200 (A1 ORIGINAL)	DRAWING:	Proposed Site Plan Ground Level
DRAWN: AL DATE: 02.10.2019	18150	P201	-

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info@osparchitecture.com www.osparchitecture.com
Tel: 01252 267878
OSP Architecture Limited. Company Registration No. 2878861

Appendix A.2 – Environment Agency Flood Report

Product 4 (Detailed Flood Risk) for: Lock Up Garage Site, South Worple Way, East Sheen, SW14 8ND
Requested by: Bradley Whittaker
Reference: KSL 107551 LB
Date: 23/11/2018

Contents

The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements to the data for this location have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

Please refer to the Open Government Licence which explains the permitted use of this information.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Flood Map for Planning (Rivers and Sea)

The Flood Map:

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. In addition, the map also shows the location of some flood defences and the areas that benefit from them.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time and also take into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at https://www.gov.uk/check-flood-risk

At this Site:

The Flood Map shows that this site lies within the outline of Flood Zone 2. This zone comprises land assessed as having between a 0.5% (1 in 200) and 0.1% (1 in 1000) annual probability of tidal flooding.

Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using detailed modelling of the tidal River Thames through the Thames Tidal Defences Study completed in 2006 by Halcrow Ltd.

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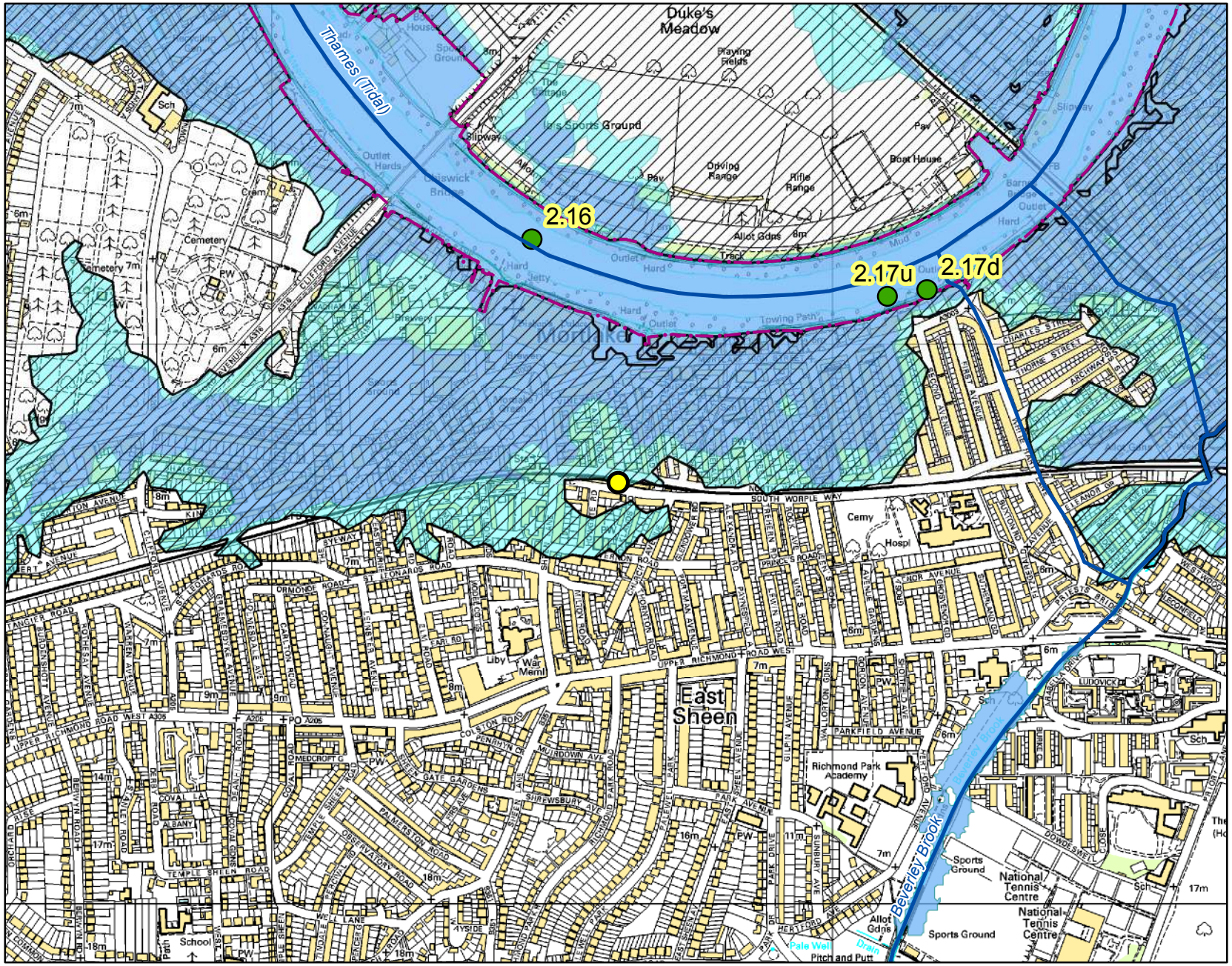
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Detailed FRA Map centred on SW14 8ND created 23/11/2018 [Ref: KSL 107551 LB]



Environment Agency

Scale 1: 10,000

N W E S

Legend

- Main Rivers
- Site
- TE2100 Model Nodes
- Flood Map - Defences
- Flood Map - Flood Storage Areas
- Areas Benefitting from Flood Defences
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2

Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of occurring each year
- or from a river with a 1% or greater chance of occurring each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Thames Estuary 2100 (TE2100)

You have requested in-channel flood levels for the tidal river Thames. These have been taken from the Thames Estuary 2100 study completed by HR Wallingford in 2008. The modelled node closest to your site is **2.16**; the locations of nearby nodes are also shown on the enclosed map.

Details about the TE2100 plan

The TE2100 plan is now live and within it are a set of levels on which the flood risk management strategy is based. The plan is the overarching flood management strategy for the Thames Estuary and therefore any development planning should be based on the same underlying data.

Details about the TE2100 in-channel levels

The TE2100 in-channel levels take into account operation of the Thames Barrier when considering future levels. The Thames Barrier requires regular maintenance and with additional closures the opportunity for maintenance will be reduced. When this happens, river levels – for which the Barrier would normally shut for the 2008 epoch – will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upriver of the barrier will increase and the tidal walls will need to be heightened to match.

Why is there no return period for levels upriver of the barrier?

The levels upriver of the barrier are the highest levels permitted by the operation of the Thames Barrier. If levels and flows are forecast to be any higher, the Thames Barrier would shut, ensuring that the tide is blocked and the river maintained to a low level. For this reason the probability of any given water level upriver of the Barrier is controlled and therefore any associated return period becomes irrelevant. The Thames Barrier and associated defence system has a 1 in 1000 year standard which means it ensures that flood risk is managed up to an event that has a 0.1% annual probability. The probability of water levels upriver is ultimately controlled by the staff at the Thames Barrier.

For further information about the Thames Barrier please visit our website at:

https://www.gov.uk/the-thames-barrier

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

TE2100 2008 levels:

Levels downriver of the Thames Barrier are 0.1% AEP (1 in 1000) and levels upriver are the highest levels permitted by the Thames Barrier, described as the Maximum Likely Water Levels (MLWLs). The defence levels (left defence, right defence) are the minimum levels to which the defences should be built.

Location	Node	Easting	Northing	Extreme water level (m)	Left defence (m)	Right defence (m)	Allow for future defence raising to a level of...	
							Left Bank (m)	Right Bank (m)
Brentford	2.16	520464	176185	5.23	5.94	5.94	6.70	6.70
	2.17u	521099	176083	5.17	5.94	5.94	6.70	6.70
	2.17d	521169	176095	5.17	5.94	5.94	6.70	6.70

TE2100 climate change levels:

				2065 to 2100		2100	
Location	Node	Easting	Northing	Design water level	Defence level (both banks)	Design water level	Defence level (both banks)
Brentford	2.16	520464	176185	5.59	6.25	6.03	6.70
	2.17u	521099	176083	5.55	6.25	6.00	6.70
	2.17d	521169	176095	5.55	6.25	6.00	6.70

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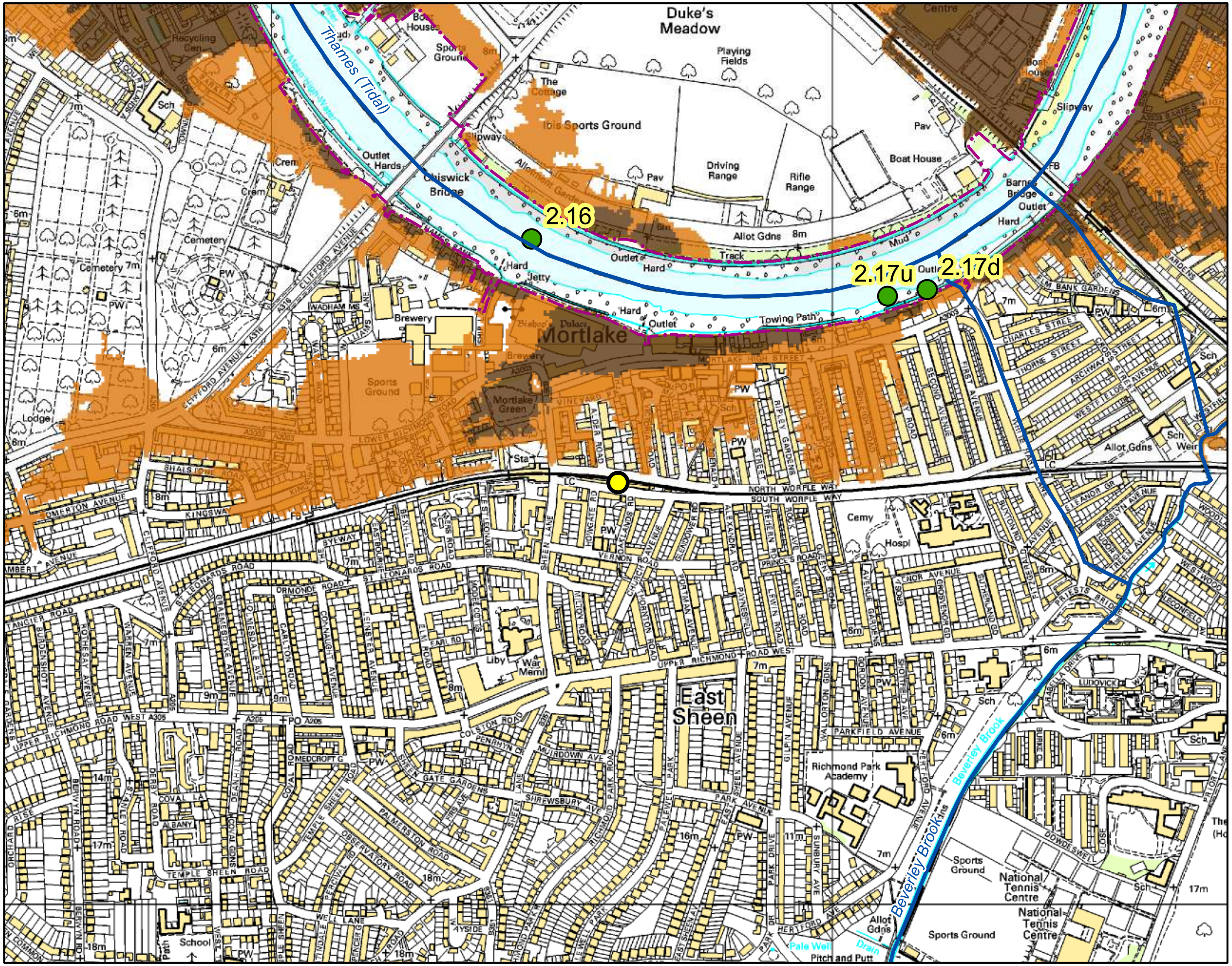
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Thames Tidal Upriver Breach Inundation Modelling - 2017

We have undertaken breach modelling through the Thames Tidal Upriver Breach Inundation Modelling Study 2017 completed by Atkins Ltd. in May 2017. However, this site is not located within the outlines of the model. Therefore no data from the breach model is available for this site.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Breach Inundation Modelling Map centred on SW14 8ND created 23/11/2018 [Ref: KSL 107551 LB]



Environment Agency

Scale 1: 10,000

Legend

- Main Rivers
- Site
- TE2100 Model Nodes
- Flood Map - Defences

Upriver MLWL Breach Inundation Epoch

- 2014
- 2100

Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width.
The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Defence Details

The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year **tidal** flood event. The defences are all raised, man-made and privately owned. It is the riparian owners' responsibility to ensure that they are maintained to a crest level of 5.94 m AODN (the Statutory Flood Defence Level in this reach of the Thames). We inspect them twice a year to ensure that they remain fit for purpose. The current condition grade for defences in the area is 2 (good), on a scale of 1 (very good) to 5 (very poor). For more information on your rights and responsibilities as a riparian owner, please see our document 'Living on the edge' found on our website at:

https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

There are no planned improvements in this area. Please see the 'Thames Estuary 2100' document on our website for the short, medium and long term Flood Risk Management strategy for London:

https://www.gov.uk/government/publications/thames-estuary-2100-te2100

Areas Benefiting from Flood Defences

This site is within an area benefiting from flood defences, as shown on the enclosed extract of our Flood Map. Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year, or flooding from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped, if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Recorded Flood Events Data

We hold records of historic flood events from rivers and the sea. Information on the floods that may have affected the area local to your site is provided below and in the enclosed map (if relevant).

Flood Event Data

We do not hold records of historic flood events from rivers and/or the sea affecting the area local to this site. However, please be aware that this does not necessarily mean that flooding has not occurred here in the past, as our records are not comprehensive.

Due to the fact that our records are not comprehensive, we would advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding and drainage systems that have been overwhelmed.

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Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Additional Information

Information Warning - OS background mapping

The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.

Planning advice and guidance

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:
https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Complete the form in the link and email back to kslplanning@environment-agency.gov.uk

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.
We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Flood Risk Assessments guidance

Flood risk standing advice for applicants

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

https://www.gov.uk/flood-risk-assessment-standing-advice

http://planningguidance.planningportal.gov.uk/

https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

https://www.gov.uk/guidance/flood-risk-and-coastal-change

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

Your Lead Local Flood Authority have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Customer services line: 020 8474 6848
Email: kslenquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

Appendix A.3 – Thames Water Asset Location Data

Asset location search

Property Searches

Herrington Consulting Limited
Barham Business Park
Unit 6Elham Valley Road
CANTERBURY
CT4 6DQ

Search address supplied

The Association Of Dental Implantology Uk
98
South Worple Way
London
SW14 8ND

Your reference BW/2232

Our reference ALS/ALS Standard/2018_3912137

Search date 20 November 2018

Keeping you up-to-date

Notification of Price Changes

From 1 September 2018 Thames Water Property Searches will be increasing the price of its Asset Location Search in line with RPI at 3.23%.

For further details on the price increase please visit our website: www.thameswater-propertysearches.co.uk
Please note that any orders received with a higher payment prior to the 1 September 2018 will be non-refundable.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

searchcode

Asset location search

Property Searches

Search address supplied: The Association Of Dental Implantology Uk, 98, South Worple Way, London, SW14 8ND

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

Thames Water Property Searches

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 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.

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: 0800 009 3921
Email: developer.services@thameswater.co.uk

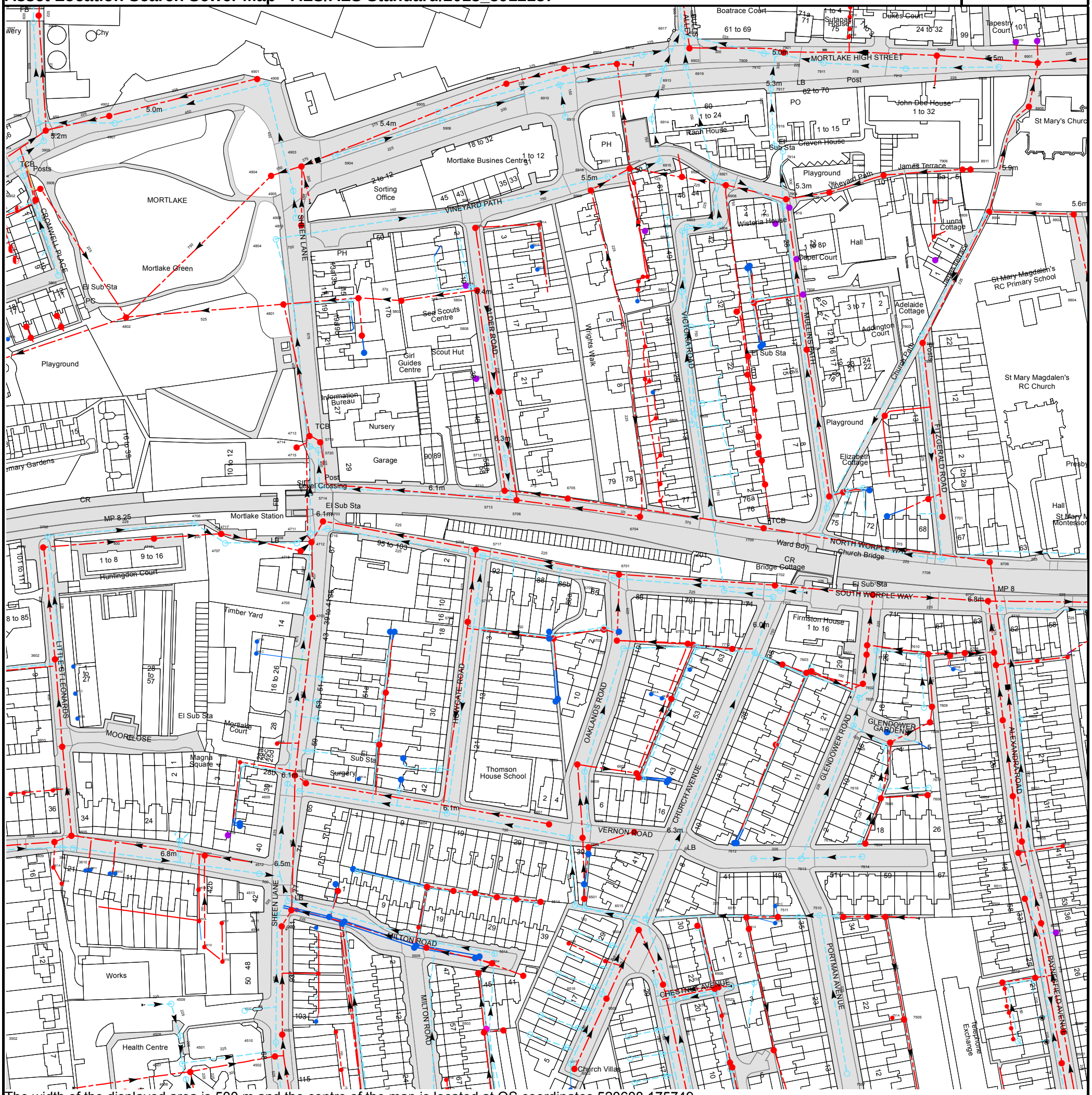
Clean Water queries

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: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2018_3912137



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 520608,175749

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
8706	6.16	1.91
7708	6.18	3.64
7701	6.1	3.73
77KN	n/a	n/a
7709	6.39	3.48
77MC	n/a	n/a
7706	6.29	3.83
77NC	n/a	n/a
77MK	n/a	n/a
77MN	n/a	n/a
77NF	n/a	n/a
77NH	n/a	n/a
78KN	n/a	n/a
7804	n/a	n/a
7802	5.84	3.2
7801	5.67	3.09
7803	5.69	3.92
8804	5.61	4.52
7619	6.37	4.27
7608	n/a	n/a
8603	6.25	4.44
8609	6.27	4.84
7622	n/a	n/a
7609	n/a	n/a
7620	6.3	4.27
7602	6.24	4.7
76NL	n/a	n/a
7603	6.02	4.9
761B	n/a	n/a
76NM	n/a	n/a
8602	6.35	4.39
861B	n/a	n/a
861A	n/a	n/a
7621	n/a	n/a
761A	n/a	n/a
7601	6.39	4.58
7610	n/a	n/a
771A	n/a	n/a
8708	6.38	4.35
7713	6.37	4.63
7704	6.45	4.56
8710	6.83	4.66
8707	6.77	4.33
7703	6.89	4.35
7904	5.06	2.39
7919	n/a	n/a
7805	n/a	n/a
7911	5.13	3.41
7918	5.14	2.67
791B	n/a	n/a
791D	n/a	n/a
791E	n/a	n/a
791A	n/a	n/a
7905	5.32	2.96
7912	5.21	3.71
781A	n/a	n/a
791C	n/a	n/a
781B	n/a	n/a
7902	5.37	1.76
7906	5.76	3.88
8911	n/a	n/a
8909	5.67	4.34
8904	5.68	2.08
8908	5.52	3.96
891D	n/a	n/a
8905	5.55	1.97
891C	n/a	n/a
8901	5.61	1.86
8802	5.62	2.12
7504	6.12	5.06
7508	6.1	5.05
7510	6.39	4.86
751C	n/a	n/a
8504	6.36	4.72
8511	6.41	5.02
7612	6.38	4.92
7613	6.53	4.74
7614	6.39	5.01
8606	6.3	4.55
861E	n/a	n/a
7615	n/a	n/a
7604	n/a	n/a
66NL	n/a	n/a
66NH	n/a	n/a
8605	6.32	2.1
7605	n/a	n/a
8604	6.3	4.52
7606	n/a	n/a
7616	n/a	n/a
8610	6.29	4.09
7617	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
7618	6.11	5.01
76HC	n/a	n/a
76JF	n/a	n/a
7607	6.16	5.12
76MJ	n/a	n/a
67MK	n/a	n/a
67MH	n/a	n/a
68KH	n/a	n/a
68JF	n/a	n/a
68NM	n/a	n/a
68JD	n/a	n/a
78LM	n/a	n/a
78NF	n/a	n/a
68JC	n/a	n/a
78ME	n/a	n/a
7712	6.05	3.64
78LH	n/a	n/a
77LH	n/a	n/a
77LF	n/a	n/a
78NM	n/a	n/a
77LK	n/a	n/a
78ML	n/a	n/a
7705	6.46	1.76
77LE	n/a	n/a
7710	6.73	3.44
7702	6.75	4.27
7711	6.78	4.67
76HK	n/a	n/a
76FF	n/a	n/a
7806	n/a	n/a
7611	5.99	4.16
76FH	n/a	n/a
681B	n/a	n/a
6914	5.5	1.63
6915	5.27	1.67
6913	4.82	1.52
6917	4.57	1.51
69NC	n/a	n/a
6806	5.34	2.58
6918	4.6	1.82
6919	4.82	2.06
6805	5.36	3.72
6903	4.71	1.07
6803	5.3	3.44
6920	4.9	2.26
6921	4.91	3.31
6804	5.26	2.5
6908	4.96	2.33
7909	4.94	2.63
7917	5.32	2.72
7916	5.32	2.75
7915	5.31	2.8
7910	n/a	2.98
781C	n/a	n/a
7913	5.07	3.02
7914	5.41	2.87
7901	4.94	1.5
67NK	n/a	n/a
67ND	n/a	n/a
66ND	n/a	n/a
66MM	n/a	n/a
6603	6.08	4.75
6609	6.09	4.68
67NJ	n/a	n/a
67MN	n/a	n/a
6709	6.72	4.49
6702	6.11	4.31
67NH	n/a	n/a
6701	6.66	4.03
6707	6.05	4.43
6602	n/a	n/a
66LJ	n/a	n/a
66LM	n/a	n/a
661A	n/a	n/a
661B	n/a	n/a
66LH	n/a	n/a
66LL	n/a	n/a
6703	5.93	4.58
661C	n/a	n/a
67MJ	n/a	n/a
67ML	n/a	n/a
6708	5.92	4.26
6607	6.03	3.82
6706	6.73	3.34
5808	6.27	5.43
5806	6.21	4.15
5710	6.2	1.5
5712	6.26	5.22
5713	6.04	4.5
5706	6.04	3.81
681C	n/a	n/a
6705	6.28	1.58
68ND	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
681D	n/a	n/a
68MN	n/a	n/a
6704	6.04	4.24
68MM	n/a	n/a
68MD	n/a	n/a
68MF	n/a	n/a
68ML	n/a	n/a
68LL	n/a	n/a
681F	n/a	n/a
68LJ	n/a	n/a
67KL	n/a	n/a
67LD	n/a	n/a
67LF	n/a	n/a
6807	5.66	4.37
68LC	n/a	n/a
6808	5.94	4.75
6809	5.95	3.03
68JM	n/a	n/a
46NH	n/a	n/a
46MN	n/a	n/a
461C	n/a	n/a
471A	n/a	n/a
461A	n/a	n/a
4602	5.92	2.18
4718	n/a	n/a
4705	5.87	2.69
46LN	n/a	n/a
4703	5.84	1.98
56HL	n/a	n/a
56JC	n/a	n/a
56HM	n/a	n/a
56NC	n/a	n/a
56ME	n/a	n/a
56NH	n/a	n/a
56MK	n/a	n/a
57NL	n/a	n/a
57NH	n/a	n/a
56LC	n/a	n/a
56KJ	n/a	n/a
5705	n/a	n/a
5718	6.57	5.16
5717	6.88	4.38
57ML	n/a	n/a
67NM	n/a	n/a
67LM	n/a	n/a
4802	5.35	.8
4716	n/a	n/a
4706	6.33	4.22
4717	n/a	n/a
4707	n/a	n/a
4801	5.22	1.38
4708	n/a	n/a
4714	5.95	3.74
4713	5.79	1.65
4715	5.75	2.45
4711	6.05	2.52
4712	n/a	n/a
5720	5.69	3.64
5714	6.03	3.92
5719	5.67	n/a
5703	6.02	3.46
5716	6	4.03
58MK	n/a	n/a
5802	5.72	1.31
58KL	n/a	n/a
58MJ	n/a	n/a
5803	n/a	1.33
581B	n/a	n/a
58LK	n/a	n/a
5704	6.83	3.79
581A	n/a	n/a
5804	6.28	1.37
4907	4.94	2.32
4901	4.93	2.36
4906	4.96	n/a
4904	5.02	.89
4804	5.05	2.06
4905	5.03	2.59
4908	4.97	n/a
4803	4.95	n/a
4903	5.08	.89
5904	5.33	3.55
5905	5.22	3.4
5906	5.39	2.77
5805	6.02	4.45
5907	5.9	4.45
5902	5.15	1.11
681E	n/a	n/a
681A	n/a	n/a
6910	5.11	2.32
6901	5.06	1.13
6911	5.27	3.76
6906	5.67	3.23

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6916	5.48	1.67
6902	4.82	1.21
6907	5.38	2.03
69NK	n/a	n/a
68NH	n/a	n/a
6912	4.72	2.17
38LK	n/a	n/a
38MK	n/a	n/a
38LL	n/a	n/a
38ML	n/a	n/a
38LM	n/a	n/a
38MM	n/a	n/a
39NK	n/a	n/a
39ND	n/a	n/a
3904	5.14	2.68
3907	5.99	1.99
39NC	n/a	n/a
39NJ	n/a	n/a
3902	4.98	3.64
3903	6	1.53
3906	5.17	2.03
3908	n/a	n/a
3905	5.19	2.25
3901	5.2	1.62
4902	4.86	1.96
3701	6.15	3.48
3702	6.16	4.58
3602	5.82	3.69
3603	n/a	n/a
361D	n/a	n/a
361C	n/a	n/a
361B	n/a	n/a
381A	n/a	n/a
38NL	n/a	n/a
38NM	n/a	n/a
38NH	n/a	n/a
38NJ	n/a	n/a
3803	4.87	3.65
451D	n/a	n/a
451E	n/a	n/a
361H	n/a	n/a
361I	n/a	n/a
361A	n/a	n/a
3610	6.8	4.74
3609	6.77	4.77
3604	6.76	4.09
3605	6.78	3.94
361E	n/a	n/a
361H	n/a	n/a
361F	n/a	n/a
451E	n/a	n/a
451D	n/a	n/a
55KL	n/a	n/a
4504	6.33	2.52
55NF	n/a	n/a
451F	n/a	n/a
55MH	n/a	n/a
451A	n/a	n/a
55LH	n/a	n/a
4511	6.34	3.37
4505	n/a	2.86
4513	6.36	3.22
55LM	n/a	n/a
451B	n/a	n/a
55LK	n/a	n/a
4512	6.54	4.41
56NL	n/a	n/a
56NM	n/a	n/a
4601	6.78	4.11
46ME	n/a	n/a
46MK	n/a	n/a
461B	n/a	n/a
46NE	n/a	n/a
46NL	n/a	n/a
4605	6.03	4.3
4604	5.92	2.97
4603	6.02	4.11
561A	n/a	n/a
56KC	n/a	n/a
56KE	n/a	n/a
55NH	n/a	n/a
55MJ	n/a	n/a
551C	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
- Storm Relief
- Vent Pipe
- Proposed Thames Surface Water Sewer
- Gallery
- Surface Water Rising Main
- Sludge Rising Main
- Vacuum
- Trunk Foul
- Trunk Combined
- Bio-solids (Sludge)
- Proposed Thames Water Foul Sewer
- Foul Rising Main
- Combined Rising Main
- Proposed Thames Water Rising Main

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

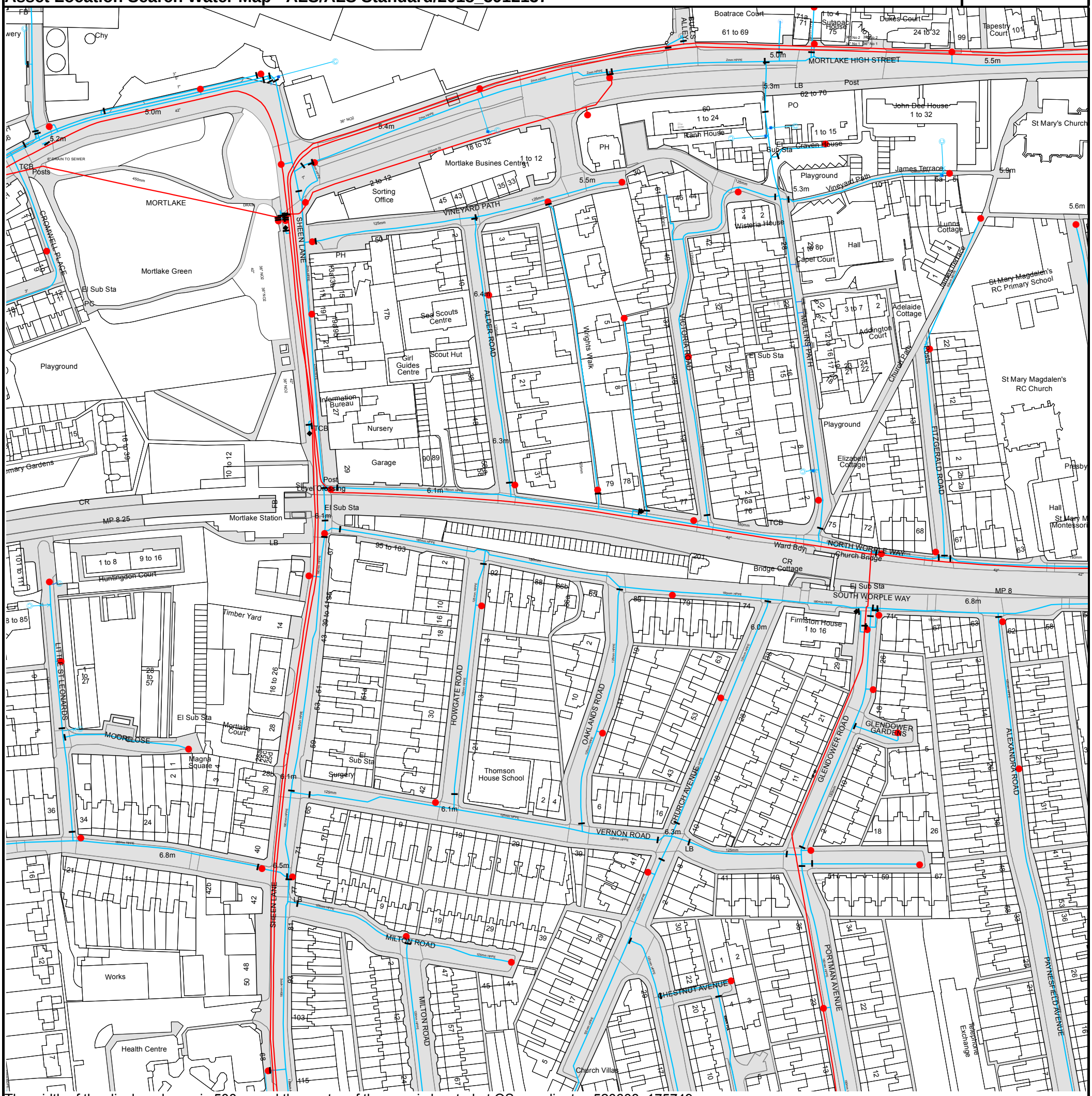
Other Sewer Types (Not Operated or Maintained by Thames Water)

- Foul Sewer
- Combined Sewer
- Culverted Watercourse
- Surface Water Sewer
- Gulley
- 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/2018_3912137



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 520608, 175749.

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 her 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 / OSS	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 A.4 – Surface Water Management Calculations

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
E.Paved	0.170	4.00	9.500	1800	120.000	100.000	1.950
E.Paved Outlet			9.000	1800	150.000	100.000	1.950
P.Paved	0.103	4.00	9.500	1800	120.000	80.000	1.950
P.Paved Outlet			9.000	1800	150.000	80.000	1.950

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
E.Pipline	10.000	20.0	750	Circular	9.500	7.550	1.200	9.000	7.050	1.200
P.Pipeline	10.000	20.0	750	Circular	9.500	7.550	1.200	9.000	7.050	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
E.Pipline	E.Paved	1800	Manhole	Adoptable	E.Paved Outlet	1800	Manhole	Adoptable
P.Pipeline	P.Paved	1800	Manhole	Adoptable	P.Paved Outlet	1800	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
E.Paved	120.000	100.000	9.500	1.950	1800	 0	E.Pipline	7.550	750
E.Paved Outlet	150.000	100.000	9.000	1.950	1800	1 	E.Pipline	7.050	750
P.Paved	120.000	80.000	9.500	1.950	1800	 0	P.Pipeline	7.550	750
P.Paved Outlet	150.000	80.000	9.000	1.950	1800	1 	P.Pipeline	7.050	750

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320
30	120	240	480	720	1440	2880	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
2	20	0	0
30	0	0	0
30	20	0	0
100	0	0	0
100	20	0	0

Node 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Safety Factor	2.0	Invert Level (m)	0.000
Side Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1.0	0.0	0.500	1.0	0.0	1.000	10.0	0.0

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Safety Factor	2.0	Invert Level (m)	0.000
Side Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1.0	0.0	0.500	1.0	0.0	1.000	10.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	E.Paved	10	7.603	0.053	33.0	0.2268	0.0000	OK
15 minute summer	E.Paved Outlet	10	7.098	0.048	33.0	0.0000	0.0000	OK
15 minute summer	P.Paved	10	7.591	0.041	20.0	0.1465	0.0000	OK
15 minute summer	P.Paved Outlet	10	7.088	0.038	20.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	E.Paved	E.Pipline	E.Paved Outlet	33.0	2.648	0.009	0.1252	12.8
15 minute summer	P.Paved	P.Pipeline	P.Paved Outlet	20.0	2.312	0.006	0.0865	7.8

Results for 2 year +20% Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	E.Paved	10	7.608	0.058	39.5	0.2489	0.0000	OK
15 minute summer	E.Paved Outlet	10	7.102	0.052	39.6	0.0000	0.0000	OK
15 minute summer	P.Paved	10	7.595	0.045	24.0	0.1611	0.0000	OK
15 minute summer	P.Paved Outlet	10	7.091	0.041	24.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	E.Paved	E.Pipline	E.Paved Outlet	39.6	2.765	0.011	0.1432	15.4
15 minute summer	P.Paved	P.Pipeline	P.Paved Outlet	24.0	2.425	0.007	0.0989	9.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	E.Paved	9	7.644	0.094	95.0	0.4047	0.0000	OK
15 minute summer	E.Paved Outlet	10	7.128	0.078	95.1	0.0000	0.0000	OK
15 minute summer	P.Paved	9	7.621	0.071	57.5	0.2565	0.0000	OK
15 minute summer	P.Paved Outlet	10	7.111	0.061	57.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	E.Paved	E.Pipline	E.Paved Outlet	95.1	3.418	0.027	0.2792	37.0
15 minute summer	P.Paved	P.Pipeline	P.Paved Outlet	57.6	3.052	0.017	0.1898	22.4

Results for 30 year +20% Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	E.Paved	9	7.655	0.105	114.0	0.4498	0.0000	OK
15 minute summer	E.Paved Outlet	10	7.135	0.085	114.1	0.0000	0.0000	OK
15 minute summer	P.Paved	9	7.629	0.079	69.0	0.2838	0.0000	OK
15 minute summer	P.Paved Outlet	10	7.117	0.067	69.1	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	E.Paved	E.Pipline	E.Paved Outlet	114.1	3.554	0.033	0.3219	44.4
15 minute summer	P.Paved	P.Pipeline	P.Paved Outlet	69.1	3.172	0.020	0.2178	26.9

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	E.Paved	9	7.660	0.110	123.6	0.4720	0.0000	OK
15 minute summer	E.Paved Outlet	10	7.138	0.088	123.8	0.0000	0.0000	OK
15 minute summer	P.Paved	9	7.633	0.083	74.9	0.2975	0.0000	OK
15 minute summer	P.Paved Outlet	10	7.119	0.069	75.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	E.Paved	E.Pipline	E.Paved Outlet	123.8	3.623	0.036	0.3434	48.1
15 minute summer	P.Paved	P.Pipeline	P.Paved Outlet	75.0	3.232	0.022	0.2320	29.2

Results for 100 year +20% Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	E.Paved	9	7.673	0.123	148.4	0.5264	0.0000	OK
15 minute summer	E.Paved Outlet	10	7.146	0.096	148.5	0.0000	0.0000	OK
15 minute summer	P.Paved	9	7.642	0.092	89.9	0.3296	0.0000	OK
15 minute summer	P.Paved Outlet	10	7.126	0.076	90.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	E.Paved	E.Pipline	E.Paved Outlet	148.5	3.758	0.043	0.3969	57.8
15 minute summer	P.Paved	P.Pipeline	P.Paved Outlet	90.0	3.382	0.026	0.2675	35.0

Drainage Design Report

Flow+

v6.0

Network	Storm Network
Filename	S:\LIVE Project Files\2232 - South Worple Way, London\Analysis\Causeway_Oct '19\Proposed\Permeable Paving.pfd
Username	Flood Team (flood@herringtonconsulting.co.uk)
Last analysed	16/10/2019 11:29:57
Report produced on	16/10/2019 11:41:49

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Rainfall Methodology	FSR
Return Period (years)	100
Additional Flow (%)	0
FSR Region	England and Wales
M5-60 (mm)	20.000
Ratio-R	0.400
CV	0.750
Time of Entry (mins)	4.00
Maximum Time of Concentration (mins)	30.00
Maximum Rainfall (mm/hr)	50.0
Minimum Velocity (m/s)	1.00
Connection Type	Level Soffits
Minimum Backdrop Height (m)	0.200
Preferred Cover Depth (m)	1.200
Enforce best practice design rules	

	Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)	Notes
	SWMH1	0.059	4.00		49.700	Manhole	Adoptable	1200				1.350	
	Flow Control				49.700	Manhole	Adoptable	1200				1.519	
	SWMH2	0.044	4.00		49.700	Manhole	Adoptable	1200				1.300	
	Existing Sewer				50.000	Manhole	Adoptable	1200				1.869	

	Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)	Min DS IL (m)
	1.000	SWMH1	Flow Control	10.000	0.600	Colebrook-White	48.350	48.181	0.169	59.2	150	Circular	4.13	50.0	
	2.000	SWMH2	Flow Control	10.000	0.600	Colebrook-White	48.400	48.231	0.169	59.2	100	Circular	4.17	50.0	
	1.001	Flow Control	Existing Sewer	5.000	0.600	Colebrook-White	48.181	48.131	0.050	100.0	150	Circular	4.25	50.0	

	Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Minimum Depth (m)	Maximum Depth (m)	Σ Area (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)	Notes
	1.000	SWMH1	Flow Control	1.310	23.1	8.0	1.200	1.369	1.200	1.369	0.059	0.0	61	1.190	
	2.000	SWMH2	Flow Control	1.003	7.9	6.0	1.200	1.369	1.200	1.369	0.044	0.0	65	1.103	
	1.001	Flow Control	Existing Sewer	1.005	17.8	14.0	1.369	1.719	1.369	1.719	0.103	0.0	100	1.111	

Link ID	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)	US Node ID	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node ID	Dia (mm)	Width (mm)	Node Type	MH Type
1.000	10.000	59.2	150	Circular	49.700	48.350	1.200	49.700	48.181	1.369	SWMH1	1200		Manhole	Adoptable	Flow Control	1200		Manhole	Adoptable
2.000	10.000	59.2	100	Circular	49.700	48.400	1.200	49.700	48.231	1.369	SWMH2	1200		Manhole	Adoptable	Flow Control	1200		Manhole	Adoptable
1.001	5.000	100.0	150	Circular	49.700	48.181	1.369	50.000	48.131	1.719	Flow Control	1200		Manhole	Adoptable	Existing Sewer	1200		Manhole	Adoptable

Node ID	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	MH Type		Link ID	IL (m)	Dia (mm)	Link Type
SWMH1			49.700	1.350	1200		Manhole	Adoptable					
									0	1.000	48.350	150	Circular
Flow Control			49.700	1.519	1200		Manhole	Adoptable	1	2.000	48.231	100	Circular
									2	1.000	48.181	150	Circular
									0	1.001	48.181	150	Circular
SWMH2			49.700	1.300	1200		Manhole	Adoptable					
									0	2.000	48.400	100	Circular
Existing Sewer			50.000	1.869	1200		Manhole	Adoptable	1	1.001	48.131	150	Circular

Rainfall Methodology	FSR		Return Period (years)	Climate Change (%)
FSR Region	England and Wales		1	0
M5-60 (mm)	20.000		30	0
Ratio-R	0.400		100	0
Summer CV	0.750		100	20
Winter CV	0.840		100	40
Analysis Speed	Normal			
Drain Down Time (mins)	240			
Additional Storage (m³/ha)	20.0			
Storm Durations (mins)	15			
	30			
	60			
	120			
	180			
	240			
	360			
	480			
	600			
	720			
	960			
	1440			
Check Discharge Rate(s)	x			
1 year (l/s)				
30 year (l/s)				
100 year (l/s)				
Check Discharge Volume	x			
100 year 360 minute (m³)				

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.49%

Event	US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	SWMH1	172	48.485	0.135	2.4	6.6525	0.0000	OK	1.000	Flow Control	0.7	0.225	0.031	0.1716	
180 minute winter	Flow Control	172	48.485	0.304	1.1	0.3439	0.0000	SURCHARGED	Orifice	Existing Sewer	0.5				10.2
180 minute winter	SWMH2	176	48.485	0.085	1.8	4.4481	0.0000	OK	2.000	Flow Control	1.1	0.392	0.137	0.0746	
15 minute summer	Existing Sewer	1	48.131	0.000	0.4	0.0000	0.0000	OK							

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.49%

Event	US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SWMH1	352	48.649	0.299	2.8	15.3528	0.0000	SURCHARGED	1.000	Flow Control	0.9	0.137	0.040	0.1760	
360 minute winter	Flow Control	352	48.649	0.468	0.9	0.5295	0.0000	SURCHARGED	Orifice	Existing Sewer	0.6				17.5
360 minute winter	SWMH2	352	48.649	0.249	2.5	16.0999	0.0000	SURCHARGED	2.000	Flow Control	0.6	0.382	0.077	0.0782	
15 minute summer	Existing Sewer	1	48.131	0.000	0.5	0.0000	0.0000	OK							

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.49%

Event	US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	SWMH1	464	48.741	0.391	2.9	20.2199	0.0000	SURCHARGED	1.000	Flow Control	1.0	0.117	0.043	0.1760	
480 minute winter	Flow Control	464	48.741	0.560	1.0	0.6334	0.0000	SURCHARGED	Orifice	Existing Sewer	0.6				22.5
480 minute winter	SWMH2	464	48.741	0.341	2.5	22.6397	0.0000	SURCHARGED	2.000	Flow Control	0.5	0.416	0.061	0.0782	
15 minute summer	Existing Sewer	1	48.131	0.000	0.5	0.0000	0.0000	OK							

Results for 100 year +20% Critical Storm Duration. Lowest mass balance: 99.49%

Event	US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SWMH1	344	49.619	1.269	4.3	22.4601	0.0000	FLOOD RISK	1.000	Flow Control	2.1	0.135	0.092	0.1760	
360 minute winter	Flow Control	344	49.618	1.437	2.1	1.6258	0.0000	FLOOD RISK	Orifice	Existing Sewer	1.0				22.5
360 minute winter	SWMH2	344	49.619	1.219	3.9	28.3305	0.0000	FLOOD RISK	2.000	Flow Control	-1.4	0.360	-0.184	0.0782	
15 minute summer	Existing Sewer	1	48.131	0.000	0.5	0.0000	0.0000	OK							

Results for 100 year +40% Critical Storm Duration. Lowest mass balance: 99.49%

Event	US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	SWMH1	304	49.700	1.350	4.0	22.6233	3.9190	FLOOD	1.000	Flow Control	3.2	0.180	0.137	0.1760	
240 minute winter	Flow Control	164	49.700	1.519	4.8	1.7180	0.1121	FLOOD	Orifice	Existing Sewer	1.0				19.4
480 minute winter	SWMH2	304	49.700	1.300	5.0	28.4766	5.1678	FLOOD	2.000	Flow Control	-2.5	0.328	-0.312	0.0782	
15 minute summer	Existing Sewer	1	48.131	0.000	0.5	0.0000	0.0000	OK							

Appendix A.5 – Indicative Drainage Layout

Scale 1 : 200 @ A1

200 0 200 400 600 m

This drawing provides an indicative layout only and does not constitute detailed drainage design. It is recommended that further site investigations are undertaken to confirm the exact layout and dimensions of any existing surface and foul waterdrainage.

Indicative Drainage Layout

South Worple Way

Key:

- Site Boundary
- Proposed Drain
- Existing Drain
- Permeable Paving
- Proposed Manhole
- Proposed Inlet / Outlet

REV	DESCRIPTION	MADE	CHECKED	DATE
P2	First Issue	AW	LA	10-10-2019
P1	First Issue	BW	LA	11-12-2018

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Drawn: AW	Date: 10-10-2019	Scale: 1:200	
Checked: LA	Date: 10-10-2019		
Approved:	Date:	Original @ A1	
Drawing Number: HC-2232-501-P1	Revision No. P2	Sheet Number: 1 of 1	Status: Preliminary

Appendix A.6 – Maintenance Schedules

Operation and Maintenance Schedule – Pervious Pavement		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface).	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying.	As required – once per year on less frequently used pavements.
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required.
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

General Operation and Maintenance Table for Pervious Pavements in accordance with CIRIA C753 The SuDS Manual.