Appendices

Appendix A

National Planning Policy Guidance

Environmental Permitting Regulations (2016)

The Environmental Permitting Regulations 2016 consolidate and replace the 2010 Regulations and subsequent amendments. The permitting regime covers a range of activities that release emissions to land, air and water, or that involve waste.

Schedule 21 relates to water discharge activities and Schedule 25 relates to flood risk activities. Schedule 22 relates to groundwater activities and the regulations place a duty on regulating authorities to implement the Water Framework Directive.

The Water Resources Act (1991) and Water Acts (2003, 2014)

The Water Resources Act 1991 provides legislation for the control of the pollution of water resources. Under this Act, offences of polluting controlled waters occur if a person knowingly permits any poisonous, noxious or polluting matter or any solid waste matter to enter any controlled waters. The Water Resources Act 1991 also provides an all-embracing system for the licensing of the abstraction of water for use, which is administered by the EA. The Water Acts (2003, 2014) modernise water legislation and amend the Water Resources Act 1991 to improve long-term water resource management.

Flood Risk Regulations (2009)

The Flood Risk Regulations 2009 transpose the Floods Directive (2007/60/EC) into law in England and Wales.

The regulations required the Lead Local Flood Authority (LLFA), to produce:

- A Preliminary Flood Risk Assessment (PFRA) by December 2011;
- Flood hazard and flood risk maps by December 2013; and
- A Local Flood Risk Management Strategy by December 2015.

The Flood and Water Management Act (2010)

The Flood and Water Management Act 2010 (FWMA), which received Royal Assent on 8 April 2010, takes forward some of the proposals in three previous documents published by the UK Government:

- Future Water;

- Making Space for Water; and
- The Government's Response to the Sir Michael Pitt's Review of the summer 2007 Floods.

The FWMA gives the EA a strategic overview of the management of flood and coastal erosion risk in England. In accordance with the Government's Response to the Pitt Review, it also gives upper tier local authorities in England responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas.

Land Drainage Acts (1991, 1994)

The water quality and flood risk management of controlled waters including rivers and aquifers is protected by legislation under the Land Drainage Acts (1991, 1994).

National Planning Policy Framework (2021)

The NPPF includes policies on flood risk and minimising the impact of flooding under Section 14, Meeting the challenge of climate change, flooding and coastal change (Paragraphs 155 – 165). The NPPF supersedes the Planning Policy Statement 25 (PPS25).

The NPPF states that:

Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and develop policies to manage flood risk from all sources, taking account of advice from the EA and other relevant flood risk management bodies, such as LLFAs and internal drainage boards.

Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change.

When determining planning applications, Local Planning Authorities (LPAs) should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, it can be demonstrated that:

- within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and
- development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of Sustainable Urban Drainage Systems (SuDS).

National Planning Practice Guidance (2018)

The NPPG, comprising a web-based resource, has been issued to ensure the effective implementation of the NPPF and contains a section covering Flood Risk and Coastal Change. It identifies how new developments are to take flood risk and climate change into account to ensure that developments not only remain safe from flooding but also do not increase flood risk elsewhere. NPPF promotes the implementation of SuDS to manage surface water in a manner that mimics existing (pre-development) conditions.

Adherence to the requirements of the NPPF can be achieved through following the Technical Guidance to the National Planning Policy Framework.

Planning Practice Guidance Para. 080 *Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:*

into the ground (infiltration);

to a surface water body;

to a surface water sewer, highway drain, or another drainage system;

to a combined sewer.

Particular types of sustainable drainage systems may not be practicable in all locations

Planning Practice Guidance Para. 085 *When planning a sustainable drainage system, developers need to ensure their design takes account of the construction, operation and maintenance requirements of both surface and subsurface components, allowing for any personnel, vehicle or machinery access required to undertake this work. Any sustainable drainage system should be designed so that the capacity takes account of the likely impacts of climate change and likely changes in impermeable area within the development over its lifetime and continues to provide effective drainage for properties.*

Sewerage Section Guidance Appendix C – Design and Construction Guidance (2020)

[Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code")]

Adopted drainage networks needs to meet the criteria outlined in the Design and Construction Guidance (2020). A piped drainage system is required to not surcharge for a 1 in 1-, 1 in 2-, or 1 in 5-year event depending on site conditions or flood the ground in a 1 in 30-year event using a design storm with the critical duration relevant to the site (i.e. the worst-case for a given return period). Private drainage systems also tend to use these criteria as a basis for design. Adoption of new sewers or abandonment of old sewers should take place in accordance with the Water Industry Act 1991, Sections 104 and 116 respectively.

DEFRA Non-Statutory Technical Standards for Sustainable Drainage Systems (2015)

The DEFRA Non-Statutory Technical Standards for Sustainable Drainage Systems provides guidance on:

- Flood risk outside the development;
- Peak Flow Control;
- Volume Control;
- Flood Risk within the development;
- Structual Integrity;
- Designing for Maintenance Considerations
- Construction

Key extracts from this document are provided below:

Peak flow control

S2 For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.

Volume control

S4 Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event.

S6 Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk.

Flood risk within the development

S7 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event.

S8 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.

S9 The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100 year rainfall event are managed in exceedance routes that minimise the risks to people and property.

The standards are supported by Practice Guidance prepared by the Local Authority SuDS Officer Organisation (LASOO).

Appendix B

Consultation with Thames Water

From:	Raluca Olariu
To:	"DEVELOPER.SERVICES@THAMESWATER.CO.U"
Subject:	RE: RE: [External] Pre Planning Application-British Library, 96 Euston Road, London. DS6075817.
Date:	19 March 2021 15:29:15

Hello Alan,

Apologies for my delayed response. I was trying to collect the information. I was wondering if it would be possible to arrange a meeting to discuss a few points regarding the drainage strategy and some of the site restrictions?

Please let me know if it's possible to organize a call? And if so when would be a good day and time for you.

Thanks I advance.

Best regards,

Raluca Olariu
Civil Engineer | Infrastructure London Group

Arup
13 Fitzroy Street London W1T 4BQ United Kingdom
d: +44 20 7755 2314
www.arup.com

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Follow @ArupGroup

From: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 03 August 2020 15:50
To: Raluca Olariu <Raluca.Olariu@arup.com>
Subject: RE: RE: [External] Pre Planning Application-British Library, 96 Euston Road, London. DS6075817.

Hi Raluca,

I have consulted with our asset planner and he has responded as follows:

'With regards to surface water we would expect the rate to be reduced further, greenfield runoff rates should always be aimed for. With regards to foul water there is not enough information to give an assessment of capacity. What will the split between the two locations be? Is this going to be foul or pumped ? What is the existing development here ?

Is this is purely a gravity connection for 6300m2 of office use ?

If it is a research facility please confirm there is no trade effluent component. '

Kind regards

Alan Dovey

Original Text

From:	Raluca Olariu <Raluca.Olariu@arup.com>
To:	DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
CC:	
Sent:	21.07.20 18:03:22
Subject:	RE: [External] Pre Planning Application-British Library, 96 Euston Road, London. DS6075817.

Hello Alan,

Thank you for your email. Please see my responses below in red.

Please note that the project is still at early stages and the numbers provided are based on assumptions.

Best regards,
Raluca

From: DEVELOPER.SERVICES@THAMESWATER.CO.U
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 21 July 2020 11:26
To: Raluca Olariu <Raluca.Olariu@arup.com>
Subject: [External] Pre Planning Application-British Library, 96 Euston Road, London. DS6075817.

Dear Miss Olariu,

Thank you for the pre planning application for the above site.

In order for me to proceed further with the wastewater capacity assessment, please provide the following information:

1. Please provide details of the existing site as per the property types in item (iii) of the application form. The existing site is part of the British Library and consists of The British Library Centre for Conservation, car park, Story Gardens, open hardstanding.

2. Please provide the diameter of the proposed foul and surface water connections. Foul: At this stage the foul drainage design is conceptual. I do not have yet the exact numbers for the foul flows and number I would give is a guess at this stage and the diameter would depend on that. Assume 100mm up to 225mm. Is there a foul flow discharge restriction at

the proposed locations? Storm: The diameter of the proposed rising main is 225mm.

3. Please confirm the pumping rate of 40l/s for the surface water is correct as this figure seems high. The assumption for the discharge rate of the storm is reducing the brownfield runoff rate by 50%. And it is 40l/s.

Kind regards

Alan Dovey

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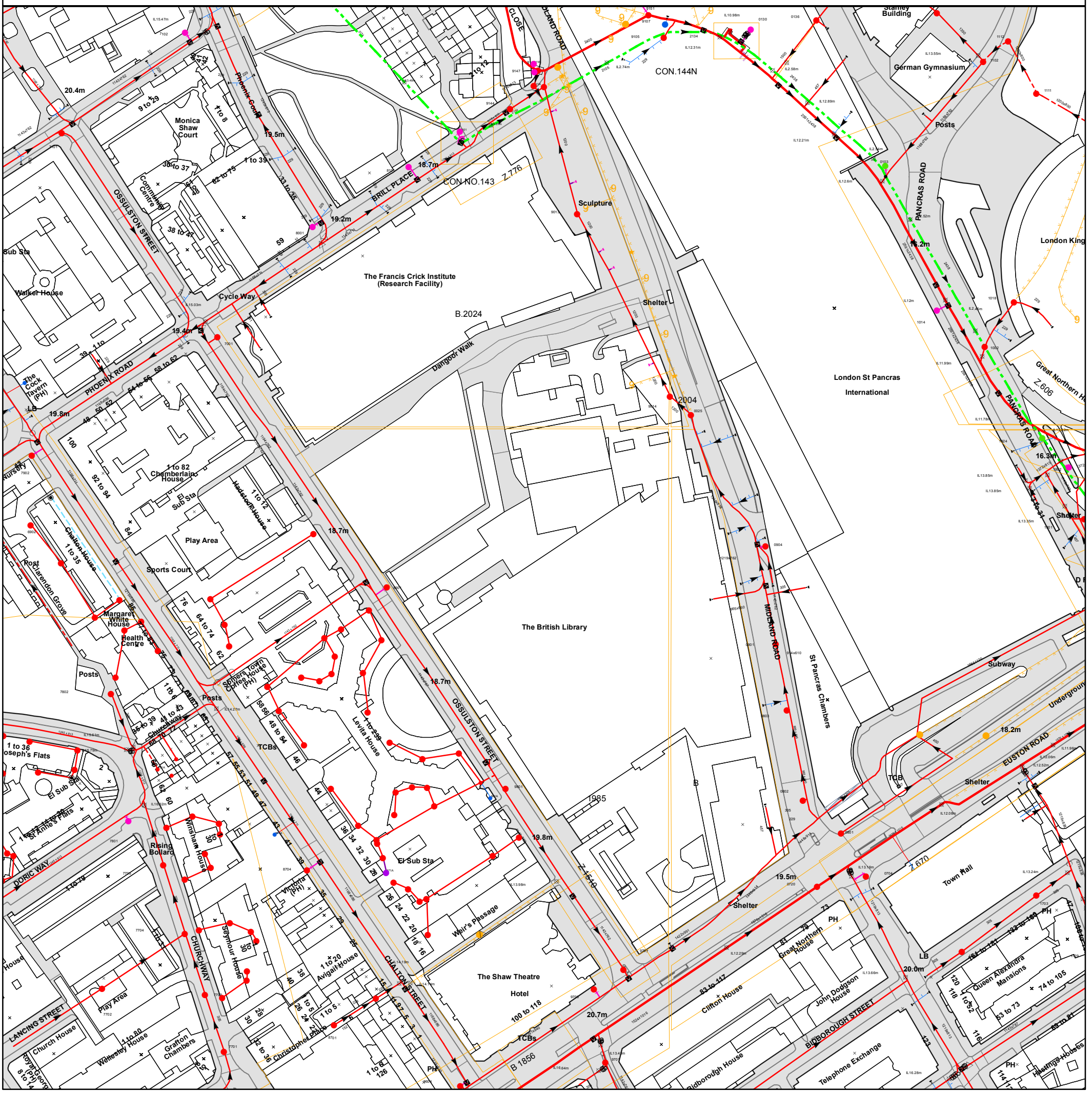
Appendix C

Thames Water Asset Map

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2020_4202217



0 10 20 40 60 80 Meters

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Printed By:	G1KANAGA
Print Date:	24/06/2020
Map Centre:	529942,182945
Grid Reference:	TQ2982NE

Comments:

ALS/ALS Standard/2020_4202217

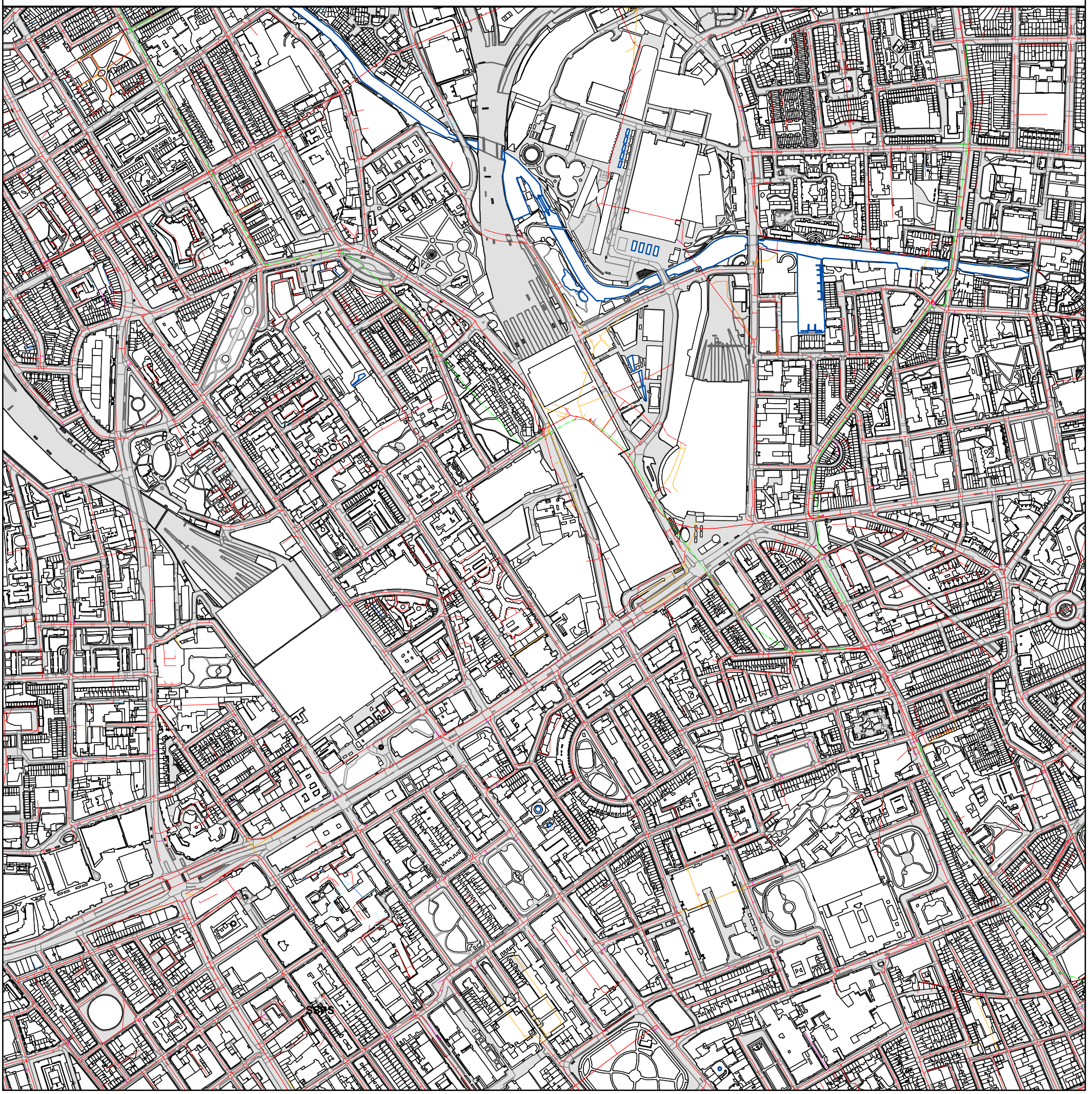
NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL
9146		12.9
911A	17.5	
9144		
9801	19.47	
8702	20.21	17.28
7705	19.28	16.61
9703		
7703	21.08	17.39
9013	18.03	13.18
9707		
8701	19.53	18.27
7001		
9151	17.02	12.36
7701	21.92	18.07
1703	19.21	15.2
0720		12.23
0704	19.28	
0025	17.5	13.66
0904		
1102	17.23	13.17
9014	17.7	13.59
0801	19.23	17.68
1014		
9107	16.67	
9101	18.3	15.73
98AG		
78FB		
88AF		
88AE		
79AB		
77AG		
87CH		
88CD		
1112	11.7	11.33
78EC		
89BF		
87DA		
68DJ		
77AH		
89BC		
88BF		
78CH		
88BG		
88CG		
68FA		
78EF		
88AC		
89AC		
78EB		
98BA		
79BD		
78BI		
88BH		
88CJ		
79BA		
78ED		
88BI		
78CG		
87BI		
87BJ		
781A		
78DE		
701A		
0803	18.17	14.72
881A		
871A		

REFERENCE	COVER LEVEL	INVERT LEVEL
911C		
8901		
9604		
7102		
9147	17.34	12.95
7702	20.59	17.47
8001		
8704		
7801	19.03	
7802	18.62	16.39
9701		
7902		
7101	20.41	15.97
0103		
0136	17.18	12.76
1924		2.37
1113	17.42	13.11
0130	16.64	
1702		
1002	16.21	12.15
8101		
1902		
9105		
1901	16.51	13.99
89BB		
79AF		
78EI		
88CE		
88CA		
79BG		
78EJ		
79BH		
1111	11.69	11.35
98AH		
77BB		
78EH		
87CJ		
68EA		
88CF		
88BD		
88DA		
88BE		
87BH		
88CH		
68FE		
89BE		
88CC		
88CB		
78EA		
87CI		
79BF		
77BA		
87CB		
87CA		
79BI		
88AD		
98AJ		
77BC		
88CI		
911B		
78CJ		
1018	11.67	11.26
0802	18.94	
0901		
7704	20.29	16.86
981A		

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2020_4202217



0 45 90 180 270 360
Meters

Scale:	1:7158
Width:	2000m
Printed By:	G1KANAGA
Print Date:	24/06/2020
Map Centre:	529942,182945
Grid Reference:	TQ2982NE

Comments:

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)

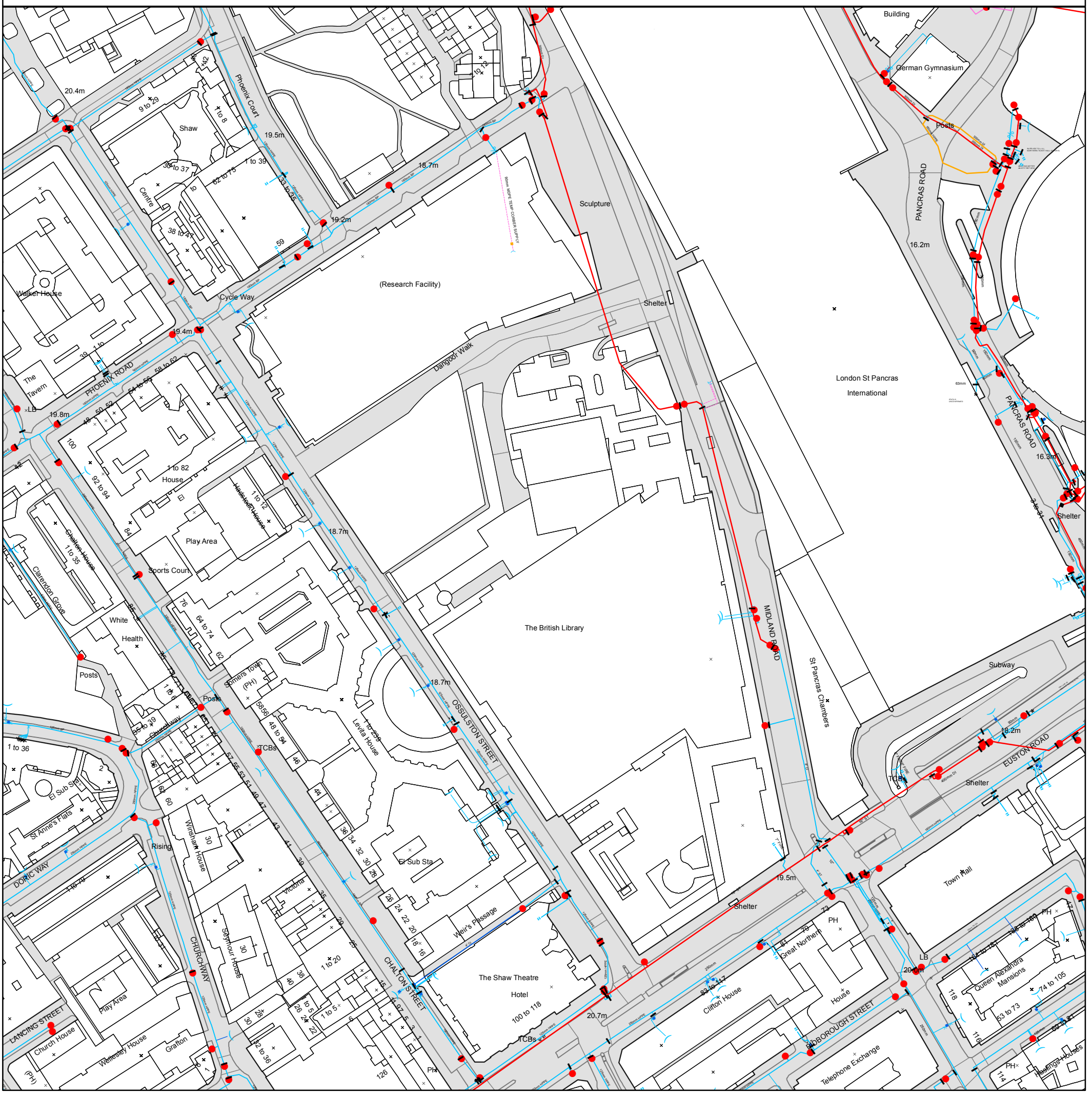
- Foul Sewer
- Surface Water Sewer
- Combined Sewer
- Gulley
- Culverted Watercourse
- Proposed
- Abandoned Sewer

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.

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2020_4202217



0 10 20 40 60 80 Meters

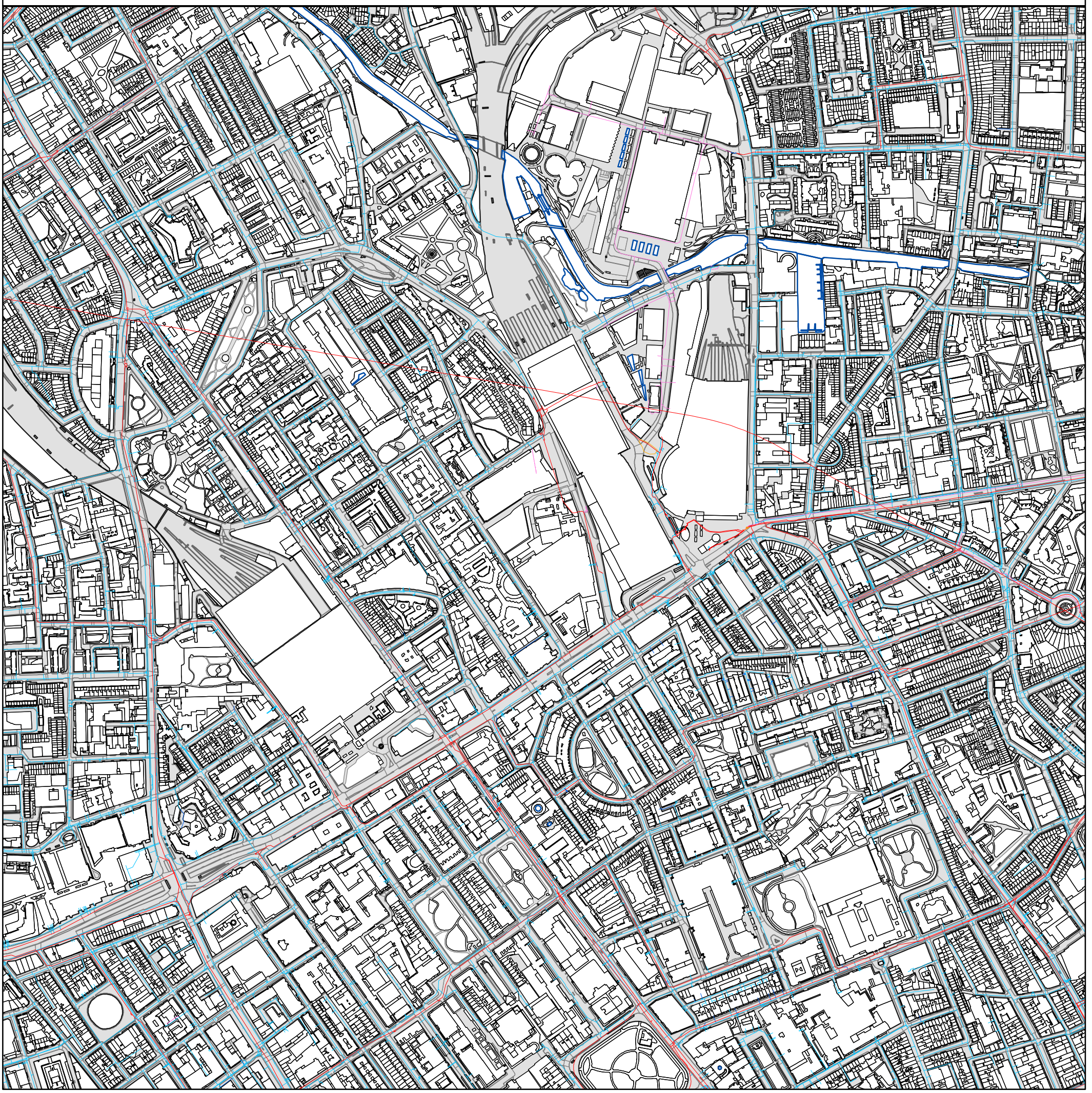
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual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

Scale:	1:1792
Width:	500m
Printed By:	G1KANAGA
Print Date:	24/06/2020
Map Centre:	529942,182945
Grid Reference:	TQ2982NE

Comments:

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2020_4202217



0 45 90 180 270 360
Meters

Scale:	1:7158
Width:	2000m
Printed By:	G1KANAGA
Print Date:	24/06/2020
Map Centre:	529942,182945
Grid Reference:	TQ2982NE

Comments:

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')

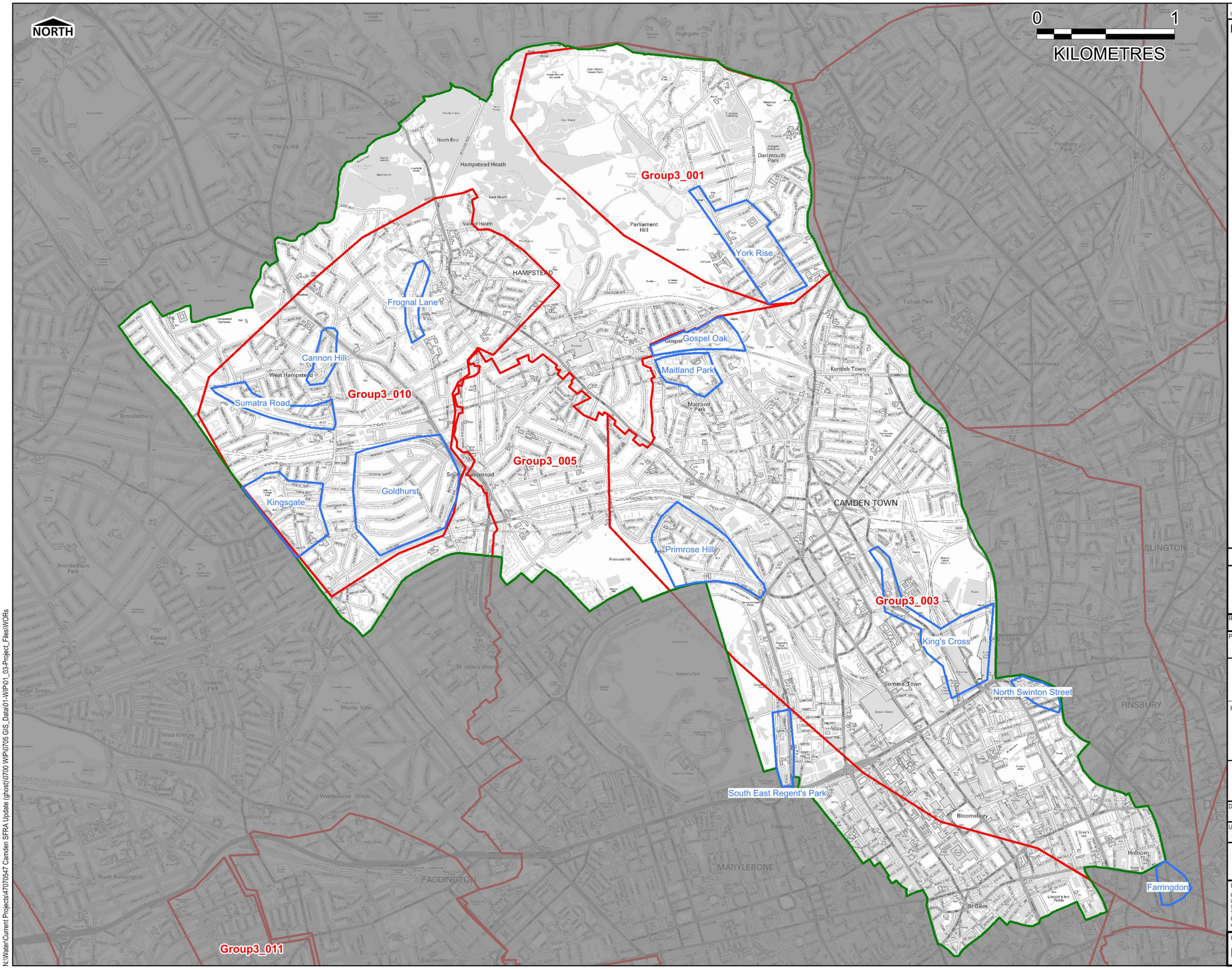
Other Water Pipes (Not Operated or Maintained by Thames Water)

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.

Appendix D

LBC Critical Drainage Area Local Flood Risk Zones



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- London Borough Camden Boundary
- Critical Drainage Area
- Local Flood Risk Zone

Revision Details	By / Check	Check Date	Suffix

Purpose of Issue: FINAL

Client: Camden

Project Title: LONDON BOROUGH OF CAMDEN STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title: Critical Drainage Areas / Local Flood Risk Zones

Drawn	Checked	Approved	Date
CB/EB	EY	MT	04/06/2014

URS Internal Project No.	Scale at A3
47070547	1:25,000

URS Infrastructure & Environment UK Limited
6 - 8 Greencoat Place
London
SW1P 1PL
Telephone +44 (0)207 7985000
Fax +44 (0)207 7985001
www.ursglobal.com

Drawing Number: FIGURE 6

Rev: Rev 2

N:\Water\Current Projects\47070547 Camden SFRA Update (ghost)\0700 WIP\0705 GIS_Data\01-WIP\01_03-Project_Files\WORs

Appendix E

Greenfield Runoff Rate Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Raluca Olariu
Site name:	British Library
Site location:	King's X

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.53072° N
Longitude:	0.12787° W
Reference:	865436903
Date:	Jul 16 2021 18:29

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 1.4437

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	616	616
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	2.27	2.27
1 in 1 year (l/s):	1.93	1.93
1 in 30 years (l/s):	5.21	5.21
1 in 100 year (l/s):	7.23	7.23
1 in 200 years (l/s):	8.47	8.47