Report

# Drainage Strategy

TSX002-SWE-XX-XX-XX-RP-C-000001

## Telehouse South Main Works

Drainage strategy for the redevelopment of the Docklands Technical Centre to redevelop an 8 storey data centre and a security gatehouse with associated facilities located at 1 Blackwall Way, Paul Julius Close, London, E14 2EH.

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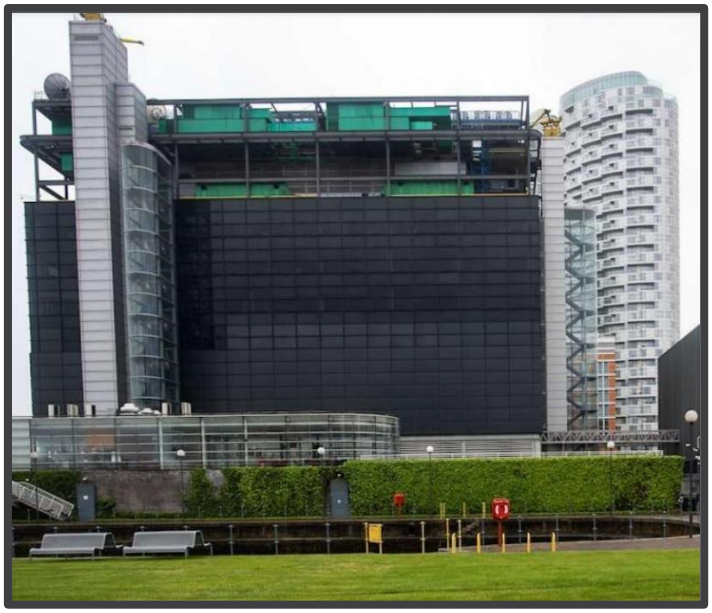

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# Table of contents

# Appendices

# 1 Introduction

Sweco UK Ltd (Sweco) have been appointed by Telehouse to produce a Drainage Strategy for the redevelopment of the Docklands Technical Centre at 1 Blackwall Way, Paul Julius Close, London, E14 2EH. This document is to be used in support of the planning submission to the London Borough of Tower Hamlets for the proposed data centre Telehouse South.

This document sets out the basic principles behind our drainage strategy and the proposals to manage the foul and surface water produced by the development. The document will also demonstrate how Sustainable Urban Drainage Systems (SuDS) will be incorporated into the development and outline the pollution prevention measures that will be used on onsite.

# 2 Site Context

The Docklands Technical Centre is located at 1 Blackwall Way, Paul Julius Close, London, E14 2EH. The site is located directly on the north bank of the River Thames, adjacent to the Blackwall Tunnel and nearby to East India DLR station, and is centred on approximate Ordnance Survey (OS) grid reference 538650, 180562. The location of the site is shown in Figure 1.

The topographical survey shows the site is relatively flat with a slight slope towards the southern edge where the River Thames is located. The existing levels are circa 5.5 metres above ordnance datum (mAOD) across most of the site.

The site formally consists of 2 multi-storey buildings for office and commercial uses which will be redeveloped to accommodate the data centre. There is also a basement at 0.75m AOD, which is currently used for fuel storage. This will be retained and will continue to be used for fuel storage. Paul Julius Close road located to the west of the site will be redeveloped to accommodate sufficient turning space for larger vehicles.

*Figure.1 Site Location Plan*

# 3 Flood Risk

A Flood Risk Assessment (FRA) was previously prepared by Sweco UK Ltd (Sweco) on behalf of Telehouse in relation to the design of the Docklands Technical Centre refit following the purchase of the building. The Flood Risk Assessment (FRA), reference 65202635-SWE-ZZ-XX-RP-0002, issued in June 2021, is attached in Appendix A and should be read in conjunction with this report.

# 4 Pre-Development Site Drainage

The utility survey (attached in Appendix B) indicates that the existing site is served by private separate foul and surface water drainage networks with the site having a total impermeable area of 1.07 ha.

Thames Water Asset Search Records (provided in Appendix C) show that there is a public combined water sewer which runs along Paul Julius Close and connects to the public combined sewer running along Blackwall Way.

## 4.1 Existing Foul Water

The utility survey indicates that the site is served by private foul water drainage which discharges to the public combined water sewer along Paul Julius Close. The site outfalls to Thames Water MH5610 leaving the site via a 225-diameter outfall.

## 4.2 Existing Surface Water

As shown in the utility survey the site is currently served by private surface water drainage which discharges to the south into the river Thames. The original surface water outfall that ran east through the adjacent property was diverted (refer to figure 2) to provide the site with a private outfall. A CCTV survey concluded the newly constructed 750mm diameter private site outfall pipe

was in good condition and connects to a 900mm diameter pipe which outfalls directly into the Thames river.

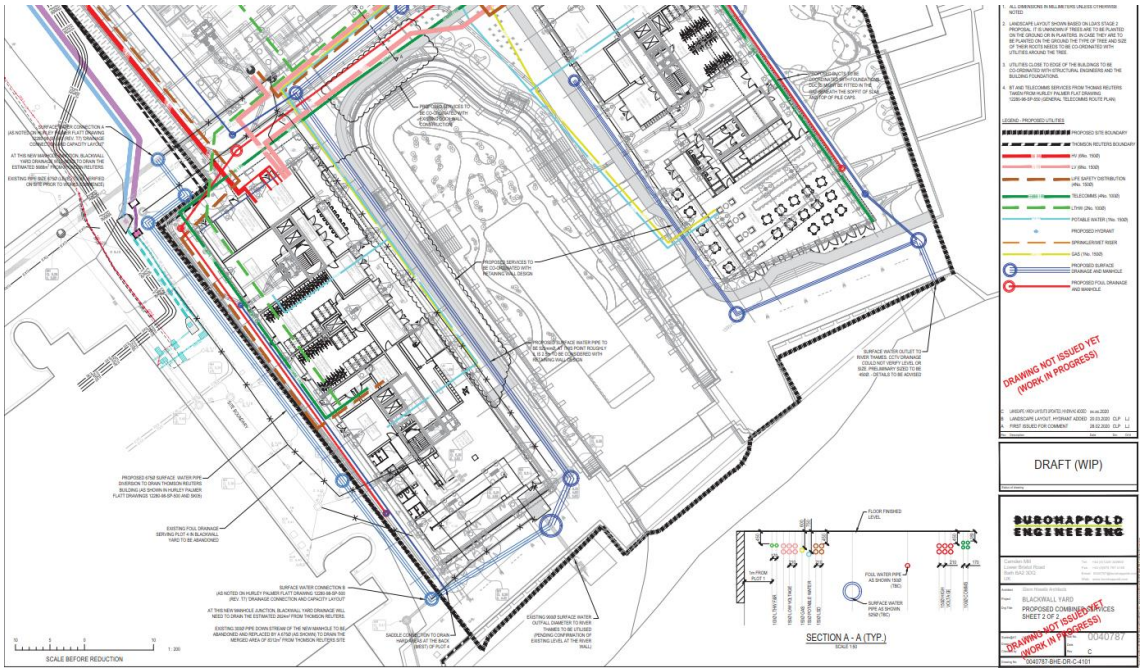


*Figure 2. Surface water outfall diversion.*

### 4.3 Existing Runoff Rates

The existing site is approximately 1.07ha (10700m$^2$) in area. As the site is considered brownfield it is assumed that all storm water falling on the hardstanding areas discharge to The River Thames. The existing runoff rates for the positively drained areas have been calculated using the modified rational method using FSR rainfall data extracted from MicroDrainage software. The existing runoff rates are shown below.

$$Q = 2.78\ Cv.i.A$$

Where:

- Cv = Volumetric Run-off co-efficient, assumed as 0.95;
- i = Average Rainfall intensity (taken from MicroDrainage Rainfall Generator using FSR data);
- A = Contributing Area, 1.07 ha.

The combined existing runoff rates for each of the three return periods has been calculated as follows;

| AEP Event | Intensity | Brownfield Runoff Rate |
|---|---|---|
| 1 in 1 year | 32.6mm/hr | 92.1l/s |
| 1 in 30 year | 80mm/hr | 226.1l/s |
| 1 in 100 year | 104mm/hr | 294l/s |
| 1 in 100 year + 40% | 145.6mm/hr | 411.5l/s |

*Table 4 – Existing Runoff Rates*

# 5 Policy Requirements

This drainage strategy sets out the principles for the proposed drainage and provides outline proposals for the development, including demonstrating how SuDS techniques are proposed to be used on site. The design of the drainage within the development will be in accordance with the current revisions of the relevant British Standards, Codes of Practice and Building Regulations. These include, but are not limited to the following:

- National Planning Policy Framework (NPPF)
- BS EN 752 - Drain and sewer systems outside buildings.
- BS EN 12056 - Drain and sewer systems inside buildings.
- Building Regulations – Part H: Drainage and waste disposal.
- UKWIR Ltd - Civil engineering specification for the water industry.
- CIRIA C753 - The SuDS Manual.
- Water UK - Sewerage Sector Guidance v1
- Pollution Prevention Guidelines (PPG 3) – For information only

## 5.1 National Planning Policy Framework & Planning Practice Guidance

Consideration has been given to the National Policy contained within the National Planning Policy Framework (NPPF) dated February 2019, issued by the Department for Communities and Local Government, with reference to Section 14 'Meeting the challenge of climate change, flooding and coastal change'. This has been read in conjunction with The NPPF Planning Practice Guidance (PPG) published in March 2012 and updated in April 2015 'Flood Risk and Coastal Change'.

## 5.2 Defra National Standard for Sustainable Drainage Systems

As stated in section B7 of the Defra National Standard for Sustainable Drainage Systems, the approach for sites on previously developed land is as follows:

- Achieving as close to greenfield runoff rates as is reasonably practicable
- The flow rate discharged from the site must not exceed that prior to the proposed development for; the 1 in 1 year and 1 in 100 year events.

The drainage systems must be designed so that, unless an area is designated for flood management in the Local Flood Risk Management Strategy, flooding from the drainage system does not occur:

- On any part of the site for a 1 in 30 year rainfall event; and
- During a 1 in 100 year rainfall event in any part of: a building or utility plant susceptible to water (e.g. pumping station or electricity substation); or
- On neighbouring sites during a 1 in 100 year rainfall event.

# 6 Drainage Principles

The design of the drainage for the proposed development will adopt, where possible, the principles embodied in Sustainable Urban Drainage Systems and will be in accordance with the CIRCA C753 – The SUDS manual.

## 6.1 Climate Change

Following a revision of the National Planning Policy Framework in February 2016, it is recommended that a proposed drainage network is designed with a climate change factor of 20% or 40%. These factors reflect the central and upper estimates of predicted increase in rainfall intensity due to climate change.

| Applies across all of England | Total potential change anticipated for the '2020s' (2015 to 2039) | Total potential change anticipated for the '2050s' (2040 to 2069) | Total potential change anticipated for the '2080s' (2070 to 2115) |
|---|---|---|---|
| Upper end | 10% | 20% | 40% |
| Central | 5% | 10% | 20% |

*Figure 1 - Abstract from GOV.UK website for Climate Change Factors*

To ensure that the development will be resilient to future increases in rainfall intensity [see figure 5] a climate change factor of 20% will be applied to all calculations and models to ensure the proposed drainage strategy minimises the risk of flooding.

Sensitivity testing for a 40% increase in rainfall intensities will be applied to the surface water network. This will determine the effects of the upper end of predicted increase in rainfall intensities over the design life of the development.

## 6.2 MicroDrainage Modelling

In accordance with best practice the surface water drainage has been designed and modelled using Windes MicroDrainage software. This will ensure that the network is designed to accommodate flows from a range of storm events. FSR rainfall data will be used for short term rainfall events (15, 30 and 60 minute storm events) and FEH2013 will be used for long term rainfall events (120min +). MicroDrainage modelling will not be used on the foul water networks.

## 6.3 Proposed Foul Drainage

6.3.1 Existing Technical Centre and External Utilities Building (EUB) Foul Flows

The foul flows from the existing two buildings will be unchanged at a peak flow of 5.5l/s discharging via existing drop points into the private foul water network before discharging into the Thames Water network offsite.

6.3.2 Gatehouse Foul Flows

There will be additional foul flows from the two toilets and tea point in the gatehouse. These have been calculated using the discharge unit (DUs) method in accordance with BS 12056:

$$Q\ (l/s) = k\sqrt{\sum DU_s}$$

Where:

k= frequency factor, k for offices=0.5

DU: discharge unit (l/s)

| Appliance | No. | System II DU | n*DU | k (frequency factor) |
|---|---|---|---|---|
| | | l/s | | |
| basin | 2 | 0.3 | 0.6 | 0.5 |
| WC | 2 | 1.8 | 3.6 | 0.5 |
| sink | 2 | 0.6 | 1.2 | 0.5 |
| dishwasher | 1 | 0.6 | 0.6 | 0.5 |
| total | | | 6 | |
| **Q (l/s)** | **1.2** | | | |

*Table 5 – Discharge unit calculation*

The estimated additional peak foul flow is 1.2 l/s and will be discharged to the existing private foul water network serving the existing site.

A pre-development enquiry has been submitted to Thames Water developer services to ensure sufficient capacity is available to accommodate the additional foul water flows from the gatehouse. Thames Water have confirmed there is capacity within the network for the connection of the gatehouse refer to Appendix F for the response.

### 6.4 Surface Water Drainage Strategy

The proposed development shall adopt where possible the principles embodied in Sustainable Urban Drainage Systems (SuDS) and follow the drainage hierarchy and principles as set out in the Building Regulations and CIRIA C753: “The SuDS Manual”. Appropriate SuDS systems of the following benefits:

- Reduce the impact of a new development on the surrounding infrastructure
- Reduce and remove pollutants from urban run-off at source and improve water quality
- Promote green spaces and provide amenity benefits within the development

The design will incorporate SuDS measures in accordance with the Environment Agency guidance and prevailing site conditions. The design shall conform to the drainage hierarchy as set out in Building Regulations Part H and expanded upon in the London Plan. A review of the drainage hierarchy is set out below.

## 6.5 Hierarchy of Discharge

The proposed drainage strategy will follow the drainage principles outlined in Section H3 of the Building Regulations Part H and the hierarchy of discharge detailed in the new London plan 2021.

## 6.6 Discharge to Watercourse

The run-off from the existing development is discharged unrestricted into the river Thames running along the southern boundary. The proposed redevelopment will not increase the run-off from the site, and where feasible the existing drainage system and outfall will be utilised.

## 6.7 Site Wide Surface Water Drainage

The existing site is almost entirely impermeable except for small, landscaped areas in the North and West of the site. As only minor works are being undertaken and the impermeable areas are not being increased, runoff from the site will not be increased. The hydraulic model does not predict any flooding up to and including a 1 in 100 +40% design storm return period within the site.

The proposal includes a new connection from the proposed gatehouse for rainwater discharge and additional gullies and drainage channels to ensure water shed from the roads and hardstanding areas is collected onsite. A new vortex separator will be installed to aid with improving water quality runoff from the site.

The increase in impermeable area for the gatehouse of 35m$^2$ is seen as a limited impact based on these results.

The proposal is to reuse the existing surface water drainage to collect the run-off from the impermeable areas. A CCTV of the existing drainage assets was completed which showed the pipes to be in good condition with minimal blockage and sediment build-up. The existing surface water drainage currently discharges unrestricted into the river Thames. It is proposed to reuse the existing outfalls. Proposed drainage layouts have been included within Appendix E. Thames Water correspondence has been included within Appendix F.

## 6.8 Evaluation of SuDS Features:

All proposed drainage schemes are required to implement Sustainable Urban Drainage (SuDS) systems in order to reduce the impact of a development on downstream water course quality. SUDS offer improvements in water quality through removal of silt and pollutants.

The table below outlines the drainage and SuDS hierarchy and how each method is being incorporated in this project.

| Drainage Hierarchy Method | Notes | Implemented |
|---|---|---|
| **Rainwater use as a resource** | Rainwater harvesting systems are not considered feasible for the redevelopment | N |
| **Rainwater infiltration to ground** | A site investigation carried out for the site has highlighted the presence of various contaminants. Therefore, infiltration is not considered suitable for the site. | N |
| **Rainwater attenuation in green infrastructure** | A green roof not proposed for the site due to the size of the site security gatehouse, due to the limited space available on site large attenuation basins and swales cannot be incorporated. | N |
| **Discharge rainwater direct to a watercourse** | The proposal is to reuse the existing outfall into the river Thames via the existing outfall | Y |
| **Controlled discharge rainwater direct to a surface water sewer/drain** | It is proposed to reuse the existing outfall into the river Thames | N |
| **Controlled discharge rainwater to a combined sewer** | It is proposed to reuse the existing outfall into the river Thames | N |

*Table 6 - Drainage Hierarchy for the site*

## 6.9 Pollution Control

A well designed and implemented drainage strategy should not only reduce runoff rates but it can improve surface water quality. There are a range of methods for managing surface water pollution risks. Table 26.3 of C753: The SuDS Manual (see Figure 7) outlines how surface water pollution can be managed at source by a range of soft and hard SuDS components. This pollution index table has been used to assess the methods of pollution where possible for the site.

The site is split into 2 different areas can be categorized with the risk levels as per the tables below:

| Area | Risk | Total Suspended Solids TSS | Metals | Hydrocarbons |
|---|---|---|---|---|
| **Roof Industrial** | Low | 0.3 | 0.2 | 0.05 |
| **Individual property driveway, low traffic road, non-residential car parking with infrequent change** | Low | 0.5 | 0.4 | 0.4 |

*Table 7 - Site Indices based on SUDs Table 26.2*

The industrial roofs on site are seen to be treated at source as all runoff must pass through several permeable layers before travelling down a gravel drain towards vertical outlets. Hence the discharge into the site surface water network from the existing roofs will have adequate pollution treatment.

Prior to discharge from the site the surface water network will be treated by a vortex separator (Hydro International Downstream Defender).

The existing fuel storage area drainage passes through an oil interceptor before entering the site surface water network effectively treating the area for any pollution accumulated in the runoff.

| Treatment | Total Suspended Solids TSS | Metals | Hydrocarbons |
|---|---|---|---|
| Hydro International Downstream Defender | 0.5 | 0.4 | 0.8 |

*Table 8 - SUDs Indices based on SUDs Table 26.3*

| Area | Suspended Solids TSS | Treatment Provided | Total Treatment of Metals | Treatment Provided | Hydrocarbons | Treatment Provided | Comment |
|---|---|---|---|---|---|---|---|
| Individual property driveway, low traffic road, non-residential car parking with infrequent change | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.8 | Enough treatment is provided |

*Table 9 - SUDs Indices Against Treatment Performance*

# 7 Operation and Maintenance

In order to ensure that the drainage networks continue to perform efficiently, and flow conditions are maintained, it is essential that the networks are appropriately maintained and inspected regularly. The operation and maintenance of the below ground drainage will be the responsibility of the building operator or someone acting on their behalf.

## 7.1 Channel drains, gullies and catchpit chambers

Channel drains and trapped gullies should be checked for silt build-up and cleared of any blockages, especially after heavy rainfall events.

## 7.2 Vortex Separator

The frequency of cleanout is determined during operation after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatable accumulation. A simple probe can be used to determine the level of accumulated solids stored in the sump from ground level. This information should be recorded in the maintenance log to establish a routine maintenance schedule.

A typical vactor unit, including both sediment and oil/floatable removal, for a 1.2m unit typically takes less than 10 minutes and removes a combined water/oil volume of about 283 litres.

- Scheduling
    - It is important to inspect your Downstream Defender® every six months during the first year of operation to determine your site-specific rate of pollutant accumulation
    - Typically, inspection may be conducted during any season of the year
    - Sediment removal is not required unless sediment depths exceed 75% of maximum clean-out depths
- Recommended Equipment
    - Safety Equipment and Personal Protective Equipment (traffic cones, work gloves, etc.)
    - Cover lifting equipment
    - Pole with skimmer or net
    - Sediment probe Trash bag for removed floatable

## 7.3 Oil Separator

The existing oil separator is to be maintained in line with Telehouse existing safety management system. Which includes bi-monthly inspections and cleaning of silt when required.

# 8 Summary

This drainage statement has been prepared to support the planning submission to the London Borough of Tower Hamlets for the redevelopment of the Docklands Technical Centre located at 1 Blackwall Way, Paul Julius Close, London.

A Flood Risk Assessment (FRA) was previously undertaken for the site on behalf of Telehouse (65202635-SWE-ZZ-XX-RP-0002, issued in June 2021) included in Appendix A. The previous FRA highlighted that the site is within Flood Zone 3 (High Risk) but in the flood context the proposals are safe and appropriate and do not increase the risk of flooding to the development itself nor does it increase the risk of flooding to surrounding property and/or assets. The FRA suggested that the majority of the site is at very low risk of pluvial flooding with localised areas at low and medium risk, very low risk of groundwater flooding and is not at risk from reservoir flooding.

The existing site is almost entirely impermeable except for small, landscaped areas in the North and West of the site. As minor modifications are being undertaken and the impermeable areas are not being increased, runoff from the site will not be increased.

The run-off from the impermeable areas will be collected using the existing private surface water drainage and passed through a vortex separator prior to discharge from site. The existing surface water drainage network has been modelled to assess its capacity for all storm events up to the 1 in 100 year return period plus 40% climate change. It is proposed to reuse the existing outfall into the river Thames.

The additional foul water flow from the gate house has been calculated using BS EN 12056 and is equal to a peak flow of 1.2 l/s. The foul water will be discharged to the existing private foul water system serving the site. The existing private foul water drainage currently discharges to the public combined sewer along Paul Julius Close.

## Appendix A – Flood Risk Assessment

Report

# Flood Risk Assessment

## Telehouse South

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07 June 2021
Project Reference: 65202635
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# Table of contents



# Table of figures

# Appendices

# 1 Introduction

Sweco UK Ltd (Sweco) were appointed by Black and White on behalf of Telehouse to undertake a Flood Risk Assessment (FRA) in relation to the design of the Docklands Technical Centre refit following the purchase of the building.

This report has been prepared for the sole use of Telehouse and the contents should not be relied upon by others without the express written authority of Sweco. If any unauthorised third party makes use of this report they do so at their own risk and Sweco owes them no duty of care or skill.

The Docklands Technical Centre was originally intended to be the first phase of a speculative office scheme set around a 18th Century restored Listed Graving Dock. Phase 1 was pre-let as a shell and core building to Thomson Reuters news agency and the internal space was re-configured to accommodate a mixed data centre and office use.

The building was purchased by Telehouse in 2021 with the aim of this project to develop designs for the complete re-development and capacity enhancement of Telehouse South (Docklands Technical Centre). As part of the Telehouse purchase agreement a large area of carpark was sold off to a developer for the creation of housing to the east of the existing building.

The scheme will involve the re-development of the existing building creating 8 No. data centre floors, 1 No. two story gatehouse and the associated infrastructure requirements.

This report has been completed in accordance with the National Planning Policy Framework (NPPF) and its accompanying Planning Practice Guidance (PPG) as well as London Borough of Tower Hamlets Level 1 Strategic Flood Risk Assessment (2017). The report is an assessment of flood risk to the development, from on and off-site sources, and to off-site receptors caused by the proposed development.

The review of the Environment Agency (EA) Flood map for planning (see Figure 1) shows that the site lies in Flood Zone 3 (high risk). Flood Zone 3 is the area described as having a 1% or greater annual probability of fluvial flooding. In addition, the site is shown to be in an area benefiting from tidal flood defences.

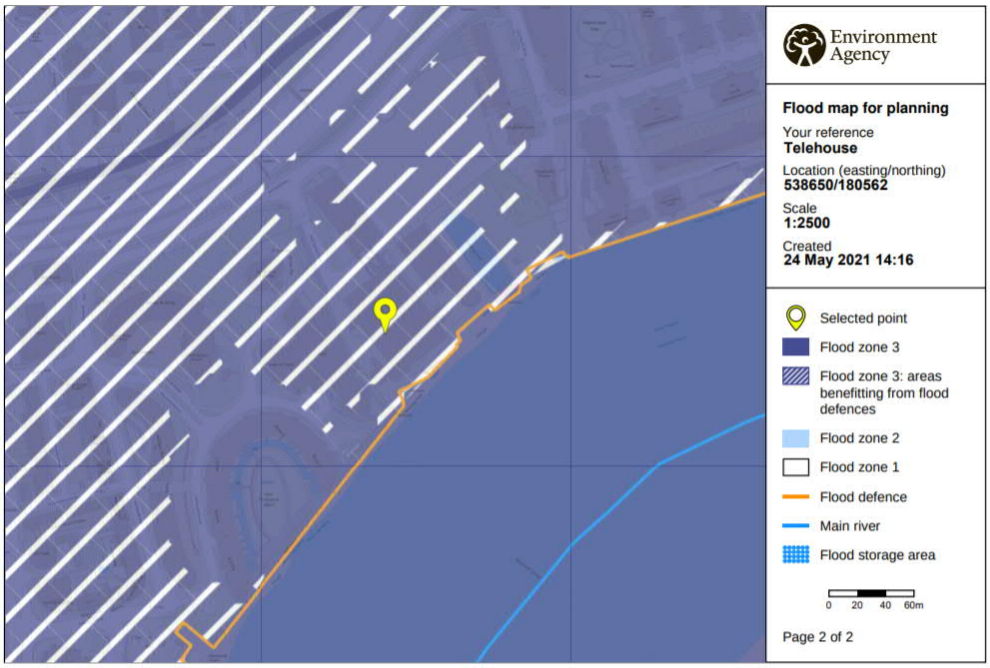



*Figure 1 - EA Flood map for planning*

The Sequential Test, the aim of which is to steer new developments to the areas with the lowest possibility of flooding, is required to be passed for developments proposed in Flood Zone 3. However, the Sequential Test does not need to be applied for change of use applications. The PPG also states that the Exception Test does not need to be applied to change of use applications

The report concludes that in flood risk context, the proposals are safe and appropriate and do not cause increased flood risk.

# 2 Policy Context

## 2.1 National Planning Policy Framework (February 2019)

The NPPF was enacted in March 2012 and updated in February 2019. Chapter 14 establishes the Planning Policy relating to flood risk management. The PPG (March 2014) provides details on policies relating to flood risk.

## 2.2 Flood and Water Management Act (2010)

The Flood and Water Management Act 2010 defines clearer roles and responsibilities for the implementation of Sustainable Drainage Systems (SuDS) in developments, by requiring drainage systems to be approved against a set of draft National standards.

In December 2014 the government set out changes to planning that apply to major development from April 2015. This change confirmed that in considering planning applications, the Local Planning Authority (LPA) should consult the relevant Lead Local Flood Authority (LLFA) on the management of surface water to satisfy themselves that the proposed minimum standards of operation are appropriate and ensure, through the use of planning conditions or planning obligations, that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

In April 2015, the LLFA became a statutory consultee on surface water and SuDS proposals.

## 2.3 London Borough of Tower Hamlets Level 1 Strategic Flood Risk Assessment (2017)

The London Borough of Tower Hamlets (LBTH) Strategic Flood Risk Assessment (SFRA) aims to inform the LBTH Sustainability Appraisal, land allocations, and policies regarding catchment wide flooding issues. The assessment considers the flood risk for the entire administrative area. Furthermore, it should allow the application of the Sequential Test to locations of development and to identify whether areas outside high and medium flood risk areas are suitable for development, based on all sources of flooding, without the application of the Exception Test. Thus, it provides a platform for consistent consideration of flood risk and accommodation of current practice and best available data.

For the purposes of applying the NPPF, flood risk is a combination of the probability and the potential consequences from the following sources:

- Flooding from rivers;
- Tidal flooding;
- Flooding from land, surface water, sewers and SuDS;
- Groundwater flooding; and
- Flooding from artificial sources.

The purpose of the LBTH SFRA is therefore to collate information across the borough to determine the variation in risk from all sources of flooding. It should be noted that the assessment of flood risk associated with mains failure is not a requirement for the planning process and is therefore excluded from the assessment. The recommended policy guidance contained within the LBTH SFRA with regard to floor levels is the following: “Finished floor levels of all residential accommodation should be raised above the 1 in 100 year (1% AEP) plus Climate Change defended level, with an allowance for freeboard (300 mm). For properties within the tidal flood zone associated with the River Thames, floor levels should be above the anticipated 2100 breach levels.”

### 2.4 London Borough of Tower Hamlets Surface Water Management Plan (2011)

The LBTH’s Surface Water Management Plan (SWMP) was published in July 2011 and outlines the preferred surface water management strategy for the borough. Surface water flooding has been defined as flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall. The objectives of the SWMP are summarised as follows:

- Develop a robust understanding of surface water flood risk in and around the borough, taking into account the challenges of climate change, population and demographic change and increasing urbanisation in London;
- Identify, define and prioritise Critical Drainage Areas, including further definition of existing local flood risk zones and mapping new areas of potential flood risk;
- Make holistic and multifunctional recommendations for surface water management, which improve emergency and land use planning, and enable better flood risk and drainage infrastructure investments; and
- Establish partnerships between key drainage stakeholders to facilitate a collaborative culture of data, skills, resource and learning sharing and exchange, and closer coordination to utilise cross boundary working of opportunities.

# 3 Site Description

## 3.1 Site context

The Docklands Technical Centre, hereafter referred to as 'the site', is located at 1 Blackwall Way, Paul Julius Close, London, E14 2EH.

The site is located directly on the north bank of the River Thames, adjacent to the Blackwall Tunnel and nearby to East India DLR station, and is centred on approximate Ordnance Survey (OS) grid reference 538650, 180562. The location of the site is shown in Figure 2.

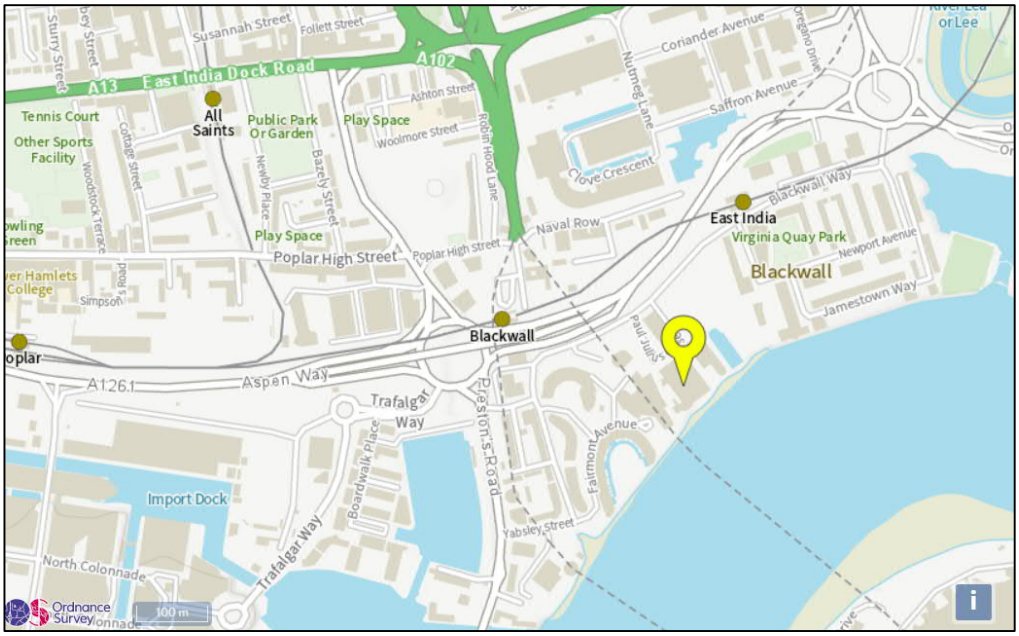



*Figure 2- Site Location Plan*

The existing site is a multi-storey building and is currently used for office and commercial uses. There is also a basement at 0.73 mAOD, which is currently used for fuel storage.

The existing site use is classified as 'Less Vulnerable' in accordance with *Table 2: Flood Risk Vulnerability Classification* of the PPG.

## 3.2 Topography

The topographical survey shows the site is relatively flat with a slight slope towards the southern edge of the site where the River Thames is located.

The existing levels are circa 5.5 metres Above Ordnance Datum (mAOD) across the majority of the site.

The existing river wall is in ‘fair’ condition in accordance with the EA standard for condition grading. The crest elevation of the existing river wall is at 5.23 mAOD along the site boundary.

### 3.3 Geology

British Geological Survey (BGS) mapping shows that the site to have a bedrock geology of London Clay Formation (Clay, Silt and Sand). The superficial geology is identified as Alluvium (Clay, Silt, Sand and Peat).

### 3.4 Hydrology

The site is located directly adjacent to the River Thames, which runs along the site’s southern boundary.

### 3.5 Historical flooding

The site does not have any record of historical flooding from any sources of flooding as indicated in the Tower Hamlets SFRA.

The site is outside of the maximum extent of historic flooding, according to the Department for Environment, Food and Rural Affairs (DEFRA) Historic Flood Map. This shows the maximum extent of all individual recorded flood outlines from river, the sea and groundwater springs and shows areas of land that have previously been subject to flooding in England. Additionally, the site is also outside of the maximum extent of the DEFRA Recorded Flood Outlines dataset. This dataset uses the same information as the Historic Flood Map dataset, but also includes data that doesn’t meet the above criteria for ‘considered and accepted’ data

### 3.6 Proposed site

The scheme will involve the re-development of the existing building creating 8 No. data centre floors, 1 No. two story gatehouse and the associated infrastructure requirements. The ground floor level will include a reception unit and a café. The basement will also be retained and will continue to be used for fuel storage. There will be no external changes to the existing buildings. Paul Julius Close road located to the west of the site will be redeveloped to accommodate sufficient turning space for larger vehicles.

# 4 Flood Risk

The NPPF requires flood risk from the following sources to be assessed:

- Tidal and fluvial sources (sea and river flooding);
- Pluvial sources (flooding resulting from overland flows);
- Groundwater sources;
- Artificial sources, canals, reservoirs etc., and;
- Increased surface water discharge.

Each of the sources are addressed separately below.

## 4.1 Tidal and fluvial flooding

The site is shown on the EA Flood Map for Planning (see Figure 1 above) to lie in the high probability flood zone (Flood Zone 3). The site also benefits from the Thames tidal flood defences.

Detailed modelled flood data was received from the Environment Agency (EA) on 5th March 2021, and the data was used to inform this FRA (see Appendix B). The flood map shows that the site lies in the high probability flood zone with 1 in 200 year (0.5% AEP) chance of tidal flooding in any year if no defences were present.

The principal flood risk to the site is from the tidal River Thames which lies immediately to the south of the site. The site is protected from flooding by the River Thames flood defences which are designed to defend London up to 1 in 1000 year tidal flood event.

### 4.1.1 Overtopping

The EA data provides in-channel flood levels for the tidal River Thames which are taken from the Thames Estuary 2100 study completed by HR Wallingford in 2008. The modelled node closest to the site is 2.46 and Table 1 below provides a summary of the information provided.

*Table 1 – Tidal Flood Levels from T2100 Flood Data*

| Node | Present Day Water Level (m AOD) | Future 2065-2100 Water Level (m AOD) | Future 2100 Water Level (m AOD) |
|---|---|---|---|
| 2.46 | 4.67 | 5.16 | 5.65 |

The defences in this area are all raised and man-made. The EA inspects the defences twice a year and has confirmed that these are of ‘fair’ condition and maintained to the statutory defence level of 5.23 mAODN (refer to Appendix B for the EA Product 4 data). There is a minimum of 560 mm clearance above the present-day extreme water level (4.67 mAOD) to the crest of the River Thames defences.

As shown in Table 2, it is proposed to raise flood defence levels to 6.20 mAOD for the year 2100 in line with the predicted tidal flood levels to maintain the standard of protection. This would provide a minimum of 550 mm clearance above the future design water levels (5.65 mAOD), ensuring the site (both existing and in future) would remain protected.

*Table 2 – Defence Levels from T2100 Flood Data*

| Node | Present Day Statuary Defence Level (m AOD) | Future 2065-2100 Defence Level (m AOD) | Future 2100 Defence (m AOD) |
|---|---|---|---|
| 2.46 | 5.23 | 5.70 | 6.20 |

### 4.1.2 Breach

Figure 3 below shows the site is located outside of the Thames Tidal Upriver Breach inundation flood extent for the present day (2005) scenario. The site, however, falls within the future scenario (2100) modelled flood extent. The site-specific modelled flood extents are produced as part of the Thames Tidal Upriver Breach Inundation Modelling study completed by Atkins in May 2017. The site-specific modelled flood levels have been provided as part of the Product 4 EA flood data (Refer to Appendix B).

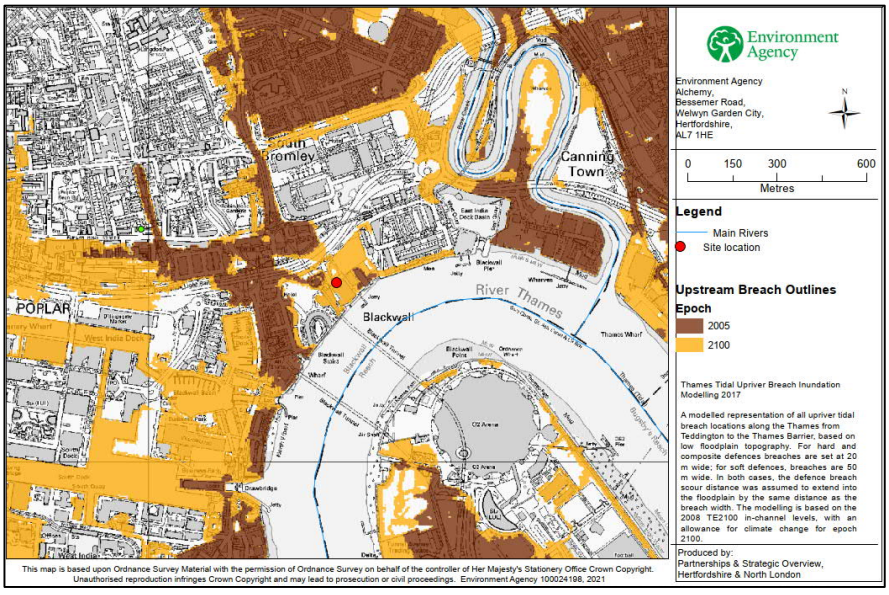



*Figure 3 - Environment Agency Breach Flood Map for Present and Future Events*

The modelled flood levels on site in the future 2100 scenario is predicted to be 5.761 mAOD. The internal ground floor level of the existing buildings is 5.425 mAOD which is proposed to be raised to 6.2 mAOD using artificial flooring. This ensures that there is a minimum of 439 mm clearance above the flood levels for the future 2100 event. It is important to note that the breach scenario is extremely unlikely to occur.

The existing basement within the building is set at 0.73 mAOD. In the event of flooding, the basement is likely to be flooded. However, there is currently a sump pump in the basement which is used to pump out any water in the event of extreme flooding.

#### 4.1.3 Management and Mitigation of Residual Flood Risk

To mitigate the risk of flooding a Flood Management Plan (FMP) should be maintained within the building. The plan should set out what measures should be taken in the event of a breach of the defences and/or flooding on site. The Thames Tidal Breach Hazard Mapping for the site shows Paul Julius Close and Blackwall Way are predicted to be at low hazard rating with flood depths smaller than 0.25 m during the future 2100 breach event (refer to Appendix B). As such, safe access and egress can be provided through the frontage of the development site.

The Flood Management Plan should include details of how and to where people should evacuate. As there will be no changes to the existing buildings, it is recommended to apply appropriate flood resilience measures to provide additional protection to the development.

### 4.2 Pluvial flooding

There is always a potential risk of surface water flooding from very high intensity rainfall events exceeding the capacity of drainage systems and causing flooding, especially in urban areas. Surface water run-off can be channelled either by natural features such as valley lines or by artificial features such as highways, to low points in the topography. If surface water is not able to flow away from the low points then pluvial flooding can occur.

The Critical Drainage Areas map within the LBTH indicates that the site is not within a critical drainage area.

The GOV.UK Extent of flooding from surface water mapping (see Figure 4) indicates that the majority of the site is classified as having a very low probability of surface water flooding. There are small areas along Paul Julius Close, which extends between the two buildings across the site, with medium to low risks from surface water flooding. This mainly corresponds to localised depression in topography within the site. Additionally, the mapping does not take account of any local drainage features which are present on site.

The GOV.UK maps show further detail in relation to the likelihood of surface water flooding across and surrounding the site; the categories are labelled high (3.3%), medium (1%) and low (0.1%) annual exceedance probabilities. These maps have been reviewed and the risk is summarised in Table 3.

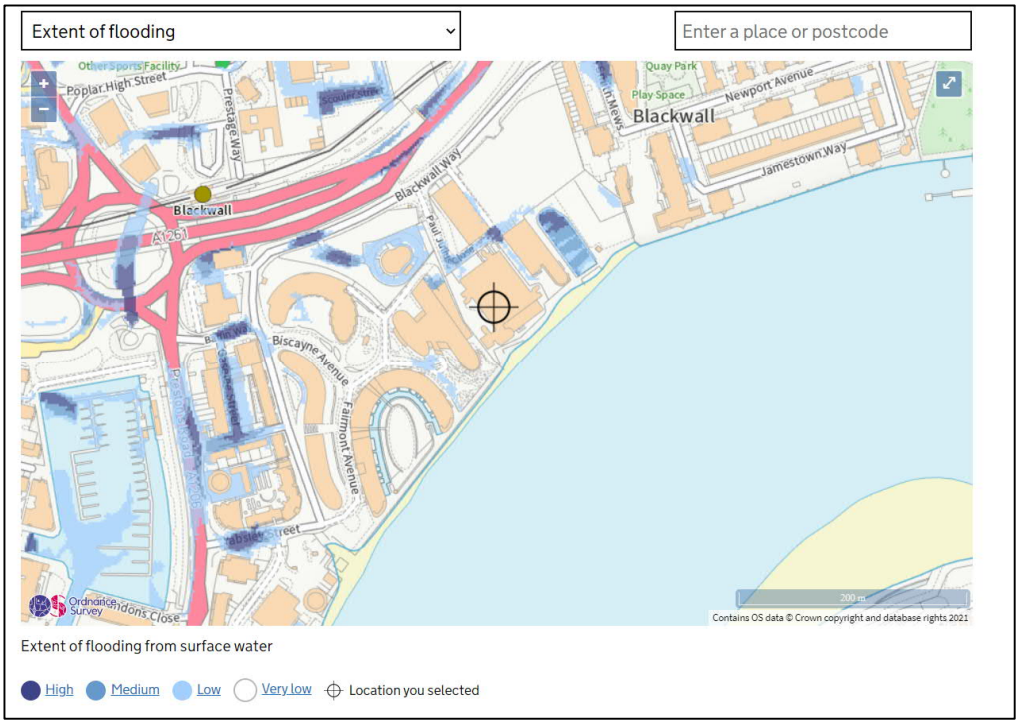



*Figure 4 - GOV.UK Flood risk – Extent of flooding map from surface water*

*Table 3 – Risk of surface water flooding on-site*

| Risk | Depth (mm) |
|---|---|
| Low | 300 to 900 |
| Medium | Below 300 |
| High | No flooding |

The existing road levels on site vary between 5.25 mAOD and 5.5 mAOD. The localised surface water flooding across Paul Julius Close road can be resolved by raising the depression areas and re-levelling the road level between the two buildings.

Additionally, the proposed internal ground floor level will be raised to 6.2 mAOD using artificial flooring, which is 950 mm to 700 mm above the existing road level along Paul Julius Close.

The flood risk to the building could also be mitigated by including flood resilient construction in the design. Specifically, consideration should be given to the use of solid concrete floors (pre-cast insitu) with closed cell insulation and no timber or voids that will not effectively drain.

Assuming the mitigation advice given above is followed, the site is considered to be at low risk of flooding from this source.

## 4.3 Groundwater

BGS mapping shows the site has a bedrock geology of London Clay Formation, comprising of Clay, Silt and Sand.

The Level 2 SFRA indicates that the site is having a low risk to groundwater flooding, with low potential of groundwater emerging due to the geology of the site and groundwater elevation (Figure 5 below).

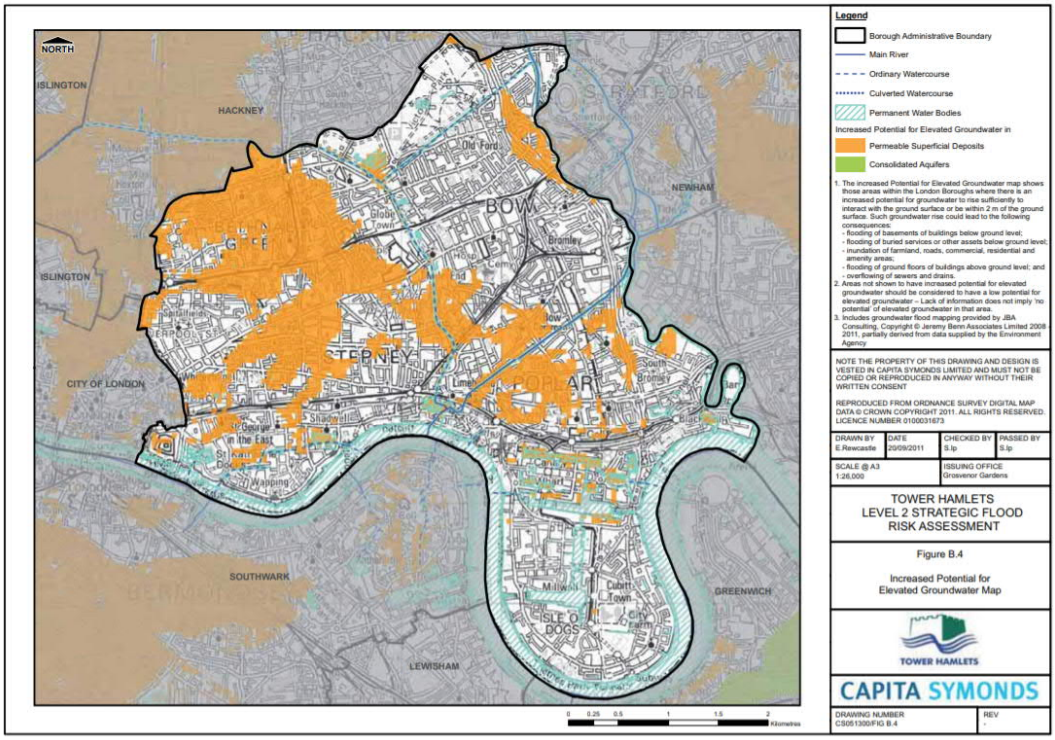



*Figure 5 - LBTH Level 2 SFRA Map B.4 – Increased Potential for Elevated Groundwater Map*

There have been no historical groundwater flood events in the vicinity of the site. However, as permeable river terrace deposits are located beneath the site, the risk of groundwater flooding may increase should the development excavation activities come into contact with these deposits.

The groundwater at the site is likely to be controlled by the water level within the River Thames, which is restricted by the operation of the Thames Barrier.

Therefore, it will rise and fall with the tides but with a delay as water seeps through the low permeability London Clays. Where there are more permeable terrace deposits the groundwater level will be more responsive to the Thames Water level. As tidal levels rise with climate change, it is likely that the groundwater levels also rise to reflect this.

The site is considered to be at low risk of flooding from groundwater.

## 4.4 Water bodies

There are no lakes, large ponds, or reservoirs etc shown within the immediate vicinity of the site which are at an elevation equal to or higher than the site or otherwise likely to pose a flood risk to the site.

The GOV.UK Flood risk from reservoirs – Extent of flooding online mapping (see Figure 6) shows that the site is not at risk of flooding from this source.,

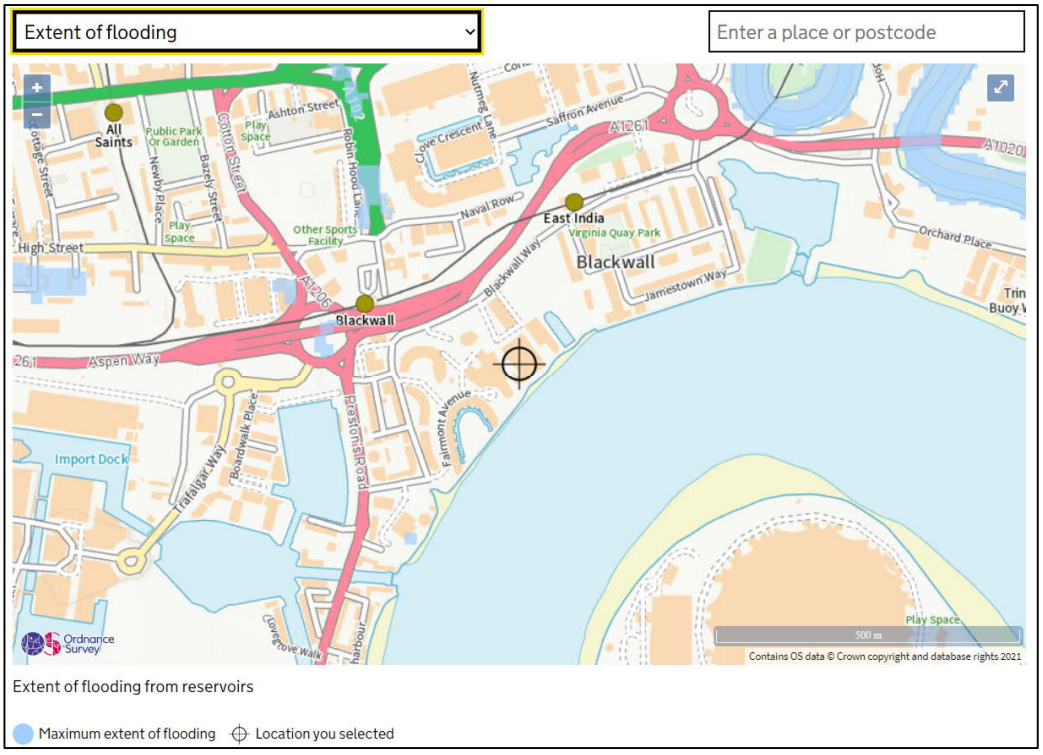



*Figure 6 - GOV.UK Flood risk – Extent of flooding map from reservoirs*

## 4.5 Infrastructure flooding

If surcharging or blockage of the off-site sewers/drains did occur it is possible that there may be localised surface flooding in areas surrounding the site. As building ground floor levels will be above surrounding ground levels there should be no significant flood risk on the site from overland or blocked sewers or drains.

The site is considered to be at low risk of flooding from this source.

## 4.6 Increased surface water discharge

As the proposed changes will be confined within the existing buildings and the building footprint will remain unchanged, there will not be any increase to the surface water generated by the buildings. There will be no change to the existing drainage regime and therefore no increased flood risk from this source.

# 5 Conclusions

The site is located in the London Borough of Tower Hamlets on the north bank of the River Thames. The River Thames defines the southern boundary of the site and Blackwall Way to the north.

The EA *Flood map for planning* shows that the site lies in Flood Zone 3. The site also benefits from flood defences with a tidal flood defence level of 5.23 mAOD. The site is located upstream of the Thames Tidal Barrier and the maximum water levels that can be expected are the highest levels permitted by the operational procedures of the Barrier.

There is a residual risk of a breach in the flood defences for the future 2100 event, with flood levels predicted to be 5.761 mAOD. The ground floor of the existing buildings is proposed to be raised from 5.425 mAOD to 6.20 mAOD using artificial flooring. This ensures that there is a minimum of 439 mm clearance above the flood levels for the future 2100 event. Therefore, the risk of flooding from breach of flood defences is considered to be low.

To mitigate the risk of flooding a Flood Management Plan (FMP) should be maintained within the building. Safe access and egress can be provided through the frontage of the road from Blackwall Way, as it shown to be at low hazard rating with flood depths smaller than 0.25 m during the future 2100 breach event.

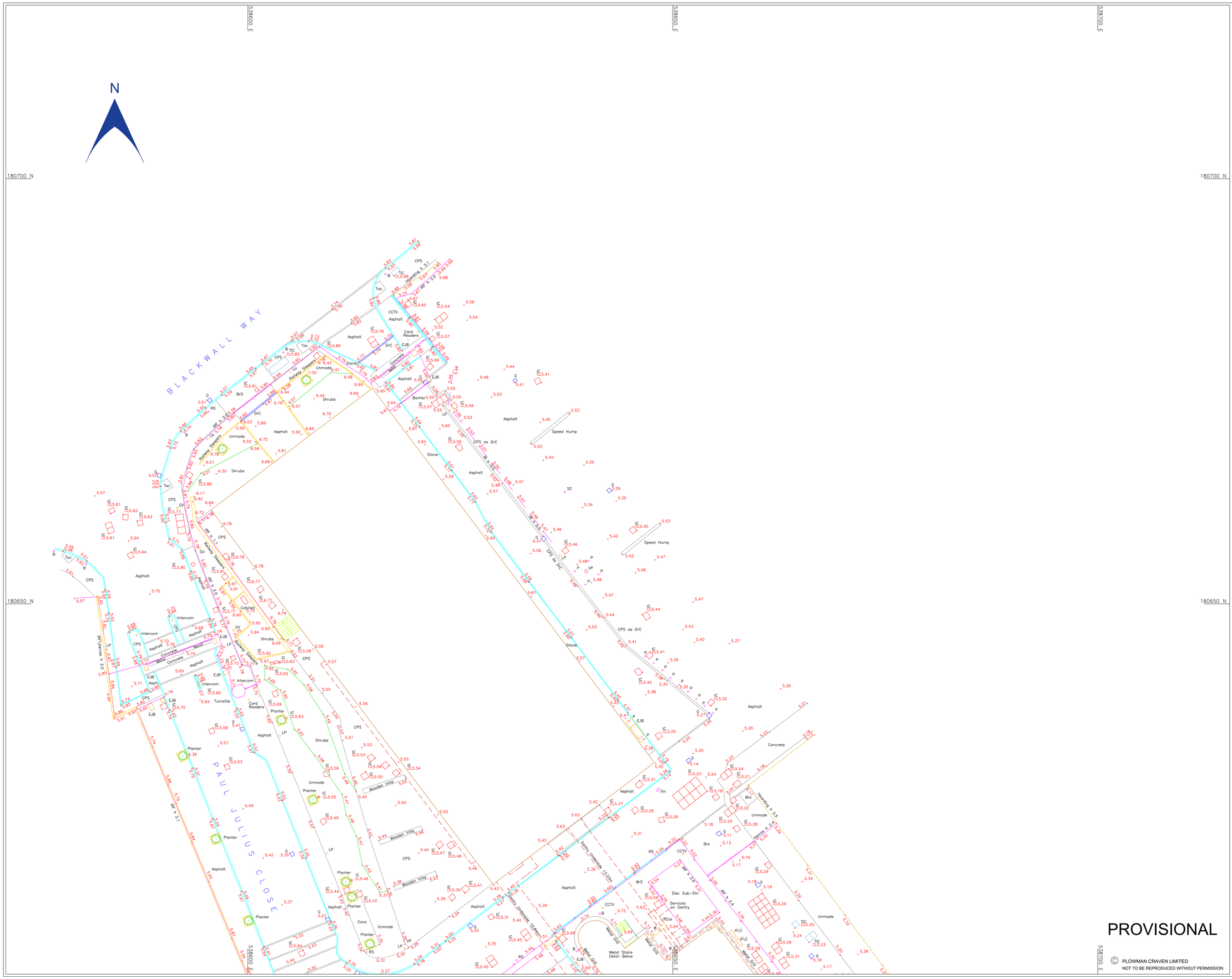
The majority of the site is classified as having a very low probability of surface water flooding. There are small areas along Paul Julius Close, which is predicted to be at medium to low risks from surface water flooding. This mainly corresponds to localised depression in topography across the road. The localised surface water flooding across the road can be resolved by raising the depression areas and re-levelling the road as part of the road works proposed for the site. The internal ground floor levels within the buildings will also be raised to 6.2 mAOD which should minimise the risk of any minor localised ponding or overland surface water flow from entering the buildings.

Risk of flooding from other sources is considered to be low.

The report concludes that in flood risk context, the proposals are safe and appropriate and do not cause increased flood risk.

## Appendix A – Existing Site

Survey Solutions drawing 24817se-01 – Topographical Survey (Sheets 1 and 2)




## STANDARD ABBREVIATIONS

| | | | |
|---|---|---|---|
| A/C | Air Conditioner | LB | Litter Bin |
| ATM | Automated Telling Machine | LP | Lamp Post |
| B | Bollard | Max | Maximum |
| BB | Bellsha Beacon | Mb | Multibole |
| Bh | Borehole | MH | Manhole |
| Br | Brick | Min | Minimum |
| BrS | Brick Setts | Mkr | Marker |
| BRW | Brick Retaining Wall | NB | Notice Board |
| BS | Bus Stop | NP | Name Plate |
| BT | British Telecom | OBF | Open Boarded Fence |
| BW | Brick Wall | O/H | Overhead |
| BWF | Barbed Wire Fence | OSBM | Ordnance Survey Bench Mark |
| CBF | Close Boarded Fence | P | Post |
| CCTV | Closed Circuit Television | PB | Pillar Box |
| CIF | Corrugated Iron Fence | PGM | Permanent Ground Marker |
| CL | Cover Level | PLt | Pavement Light |
| CLF | Chain Link Fence | PM | Parking Meter |
| Col | Column | PRF | Post and Rail Fence |
| Conc | Concrete | PS | Paving Stones |
| CoW | Cable on Wall | PWF | Post and Wire Fence |
| CPS | Concrete Paving Slabs | RE | Rodding Eye |
| CTV | Cable Television IC | RG | Road Gully |
| d | depth | RS | Road Sign |
| DC | Duct Cover | RSJ | Rolled Steel Joist |
| DH | Duct Height | RWP | Rain Water Pipe |
| DP | Down Pipe | s | spread |
| DrC | Drainage Channel | SB | Sign Board |
| EIC | Electrical Inspection Cover | SBM | Site Bench Mark |
| EJB | Electrical Junction Box | SC | Stop Cock |
| EP | Electricity Pole | SF | Security Fence |
| ER | Earthing Rod | ShB | Shrub Bed |
| ESG | Electrical Switchgear | SL | Sump Level |
| FB | Flower Bed | SO | Smoke Outlet |
| FH | Fire Hydrant | SP | Sign Post |
| FL | Floor Level | SV | Stop Valve |
| Flt | Floodlight | T | Telephone |
| g | grith | Tac | Tactile Paving |
| G | Gully | TBM | Temporary Bench Mark |
| GC | Gas Cock | TCB | Telephone Call Box |
| GM | Gas Meter | TCP | Traffic Control Post |
| GP | Gate Post | TIC | Telephone Inspection Cover |
| GV | Gas Valve | TJB | Telephone Junction Box |
| h | height | TL | Traffic Light |
| HR | Handrail | TLCB | Traffic Light Control Box |
| IB | Illuminated Bollard | TLIC | Traffic Light Inspection Cover |
| IC | Inspection Cover | TP | Telephone Pole |
| IL | Invert Level | Typ | Typical |
| IRF | Iron Railing Fence | V | Vent |
| IRS | Illuminated Road Sign | VP | Vent Pipe |
| JB | Junction Box | W | Window |
| KO | Kerb Outlet | WM | Water Meter |
| L | Light | WV | Water Valve |

—— · —— Assumed detail

The identification of service covers has been made by a surface inspection only - critical identifications should be verified by the lifting of covers or a full utilities survey

Due to the inherent instability of paper materials, drawings plotted on paper may be stretched and distorted - dimensions scaled from paper plots should therefore be treated with caution



## SHEET LAYOUT

46169T-01-01

46169T-01-02

## ISSUES & REVISIONS

| Issue | Details | By | Date |
|---|---|---|---|
| A prov 1 | Provisional Issue | PCL | 04/01/21 |

This survey is commensurate with band F accuracy, as outlined in the RICS survey detail accuracy banding table

All levels are in metres and are above Ordnance Survey Newlyn Datum derived by multiple network RTK GPS observations

The survey grid shown on this drawing is positioned on Ordnance Survey (OS) National Grid, obtained by multiple network RTK GPS observations

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All quoted dimensions are in metres

Drawing units are metres

CLIENT

CUNDALL JOHNSTON & PARTNERS LLP

4th Floor, Partnership House
Regent Farm Road
Gosforth
Newcastle Upon Tyne NE3 3AF

PROJECT TITLE

# Thomson Reuters Building

London, E14 2EH

3D Topographical Survey

PRESENTATION SCALE 1:200 @ A1

DATE OF ORIGINAL SURVEY December 2020

PC PROJECT No. 46169 CHECKED MC

DRAWING No. 46169T-01-01 ISSUE A prov 1

PROVISIONAL



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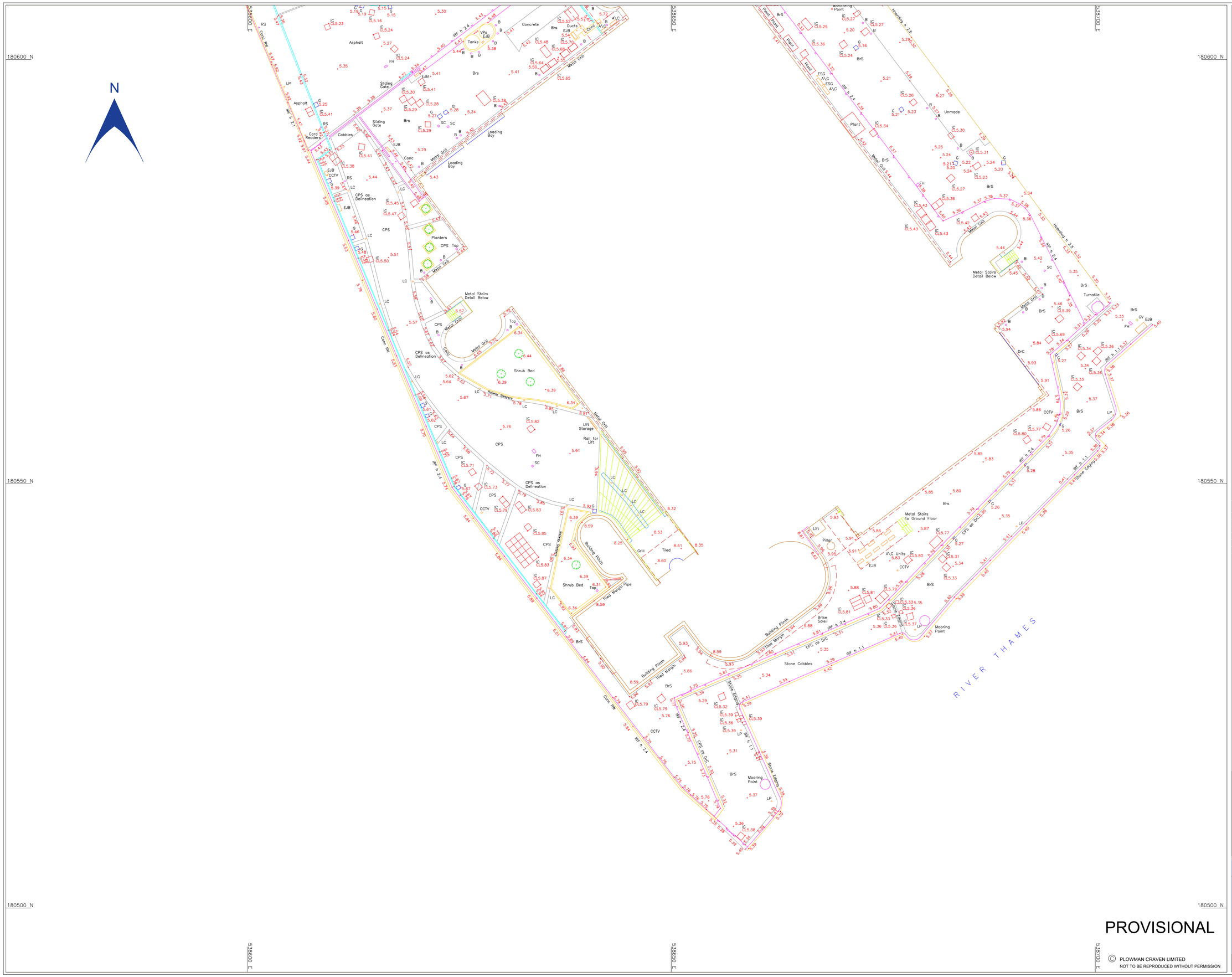


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46169T-01-02

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3D Topographical Survey

PRESENTATION SCALE 1:200 @ A1

DATE OF ORIGINAL SURVEY December 2020

PC PROJECT No. 46169 CHECKED MC

DRAWING No. 46169T-01-02 ISSUE A prov 1

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# Appendix B – EA Product 4 Data

Environment Agency P4 Data

# Product 4 (Detailed Flood Risk) for: Blackwall Way, London E14 2EH
Reference: HNL207506AS  L
Date: 05/03/2021

## 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.


Alchemy, Bessemer Road, Welwyn Garden City, Hertfordshire, AL7 1HE
Customer services line: 03708 506 506
Email: NETenquiries@environment-agency.gov.uk
Website: www.environment-agency.gov.uk

# 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 Flood Zone 3 - with a 0.5% chance of flooding from the Thames (tidal Thames flooding) in any given year.

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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Website: www.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 Thames node closest to your site is **2.46**; the locations of nearby nodes on the River Thames are also shown on the enclosed map.

**Details about the TE2100 plan**

The Plan sets out how the Environment Agency and our partners can work together to manage tidal flood risk, from now until the end of the century. It is an adaptive plan for managing the Thames Estuary, including the tidal defence system, until 2100 so that current standards of flood protection are maintained or improved taking into account climate change effects e.g. sea level rise. The Plan has 3 phases of activity:

- Until 2035 – maintain and improve current defences, safeguard areas required for future improvements, and monitor climate change indicators.
- 2035-2050 – raise existing walls, defences & smaller barriers whilst reshaping the riverside environment.
- 2050-2100 – determine and implement an option for the future of the Thames Barrier, and adapt other defences as required to work alongside this to protect the estuary.

The Thames Estuary 2100 Plan can be found at: https://www.gov.uk/government/publications/thames-estuary-2100-te2100

**Details about the TE2100 in-channel levels**

The TE2100 in-channel levels take into account operation of the **Thames/Barking** Barrier when considering future levels. The **Thames/Barking** 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.

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**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.

| Node | Easting | Northing | Extreme water level (m) | Present Day Statuatory Defence Level (Thames Left Bank) (m) | Allow for future 2100 defence raising to a level of... (Thames Left Bank) |
|---|---|---|---|---|---|
| 2.45 | 538614 | 179907 | 4.68 | 5.23 | 6.20 |
| 2.46 | 538943 | 180471 | 4.67 | 5.23 | 6.20 |
| 2.46au | 539436 | 180390 | 4.66 | 5.18 | 6.20 |
| 2.46ad | 539528 | 180320 | 4.66 | 5.18 | 6.20 |

TE2100 climate change levels:

| | | | 2065 to 2100 | | 2100 | |
|---|---|---|---|---|---|---|
| Node | Easting | Northing | Design water level | Defence level (both banks) | Design water level | Defence level (both banks) |
| 2.45 | 538614 | 179907 | 5.17 | 5.70 | 5.66 | 6.20 |
| 2.46 | 538943 | 180471 | 5.16 | 5.70 | 5.65 | 6.20 |
| 2.46au | 539436 | 180390 | 5.15 | 5.70 | 5.64 | 6.20 |
| 2.46ad | 539528 | 180320 | 5.15 | 5.70 | 5.63 | 6.20 |

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# Thames Tidal Upriver Breach Inundation Modelling – 2017

The map attached displays site-specific modelled flood levels at your site. These have been taken from the Thames Tidal Upriver Breach Inundation Modelling Study 2017 completed by Atkins Ltd. in May 2017.

We have developed a modelling approach where all upriver breach locations along the Thames are equitably modelled, to ensure a consistent approach across London. This modelling simulates 5679 continuous tidal breaches along the entire extent of the Thames from Teddington to the Thames Barrier. 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.

For breaches upriver of the Thames Barrier, there is no return period for modelled levels as the levels are controlled by barrier closures. The levels used are referred to as Maximum Likely Water Levels (MLWLs). Therefore 2005 and 2100 epochs were modelled on that basis.

This modelling has two epochs to consider; the 2005 epoch is a representation of today's flood levels without climate change considerations taken into account, and the 2100 epoch which takes into account changes likely to be seen due to climate change.

Alchemy, Bessemer Road, Welwyn Garden City, Hertfordshire, AL7 1HE
Customer services line: 03708 506 506
Email: NETenquiries@environment-agency.gov.uk
Website: www.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 5.23m mAODN (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 3 (fair), 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.

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# 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 are provided in the enclosed map.

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.

**Other Sources of Flood Risk**

The Lead Local Flood Authority for your area are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse) and may hold further information .

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.

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# Additional Information

**Use of Environment Agency Information for Flood Risk / Flood Consequence Assessments**

**Important**

If you have requested this information to help inform a development proposal, then we recommend that you undertake a formal pre-application enquiry using the form available from our website:-

https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Depending on the enquiry, we may also provide advice on other issues related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In **England**, you should refer to the Environment Agency's Flood Risk Standing Advice, the technical guidance to the National Planning Policy Framework and the existing PPS25 Practice Guide for information about what flood risk assessment is needed for new development in the different Flood Zones. These documents can be accessed via:

https://www.gov.uk/flood-risk-standing-advice-frsa-for-local-planning-authorities

https://www.gov.uk/government/publications/national-planning-policy-framework-technical-guidance

https://www.gov.uk/government/publications/development-and-flood-risk-practice-guide-planning-policy-statement-25

You should also consult the Strategic Flood Risk Assessment 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 / Consequence Assessment (FRA / FCA) 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. The information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires a FRA / FCA and this is not submitted or deficient, the Environment Agency may well raise an objection.
4. For more significant proposals in higher flood risk areas, we would be pleased to discuss details with you ahead of making any planning application, and you should also discuss the matter with your local planning authority.

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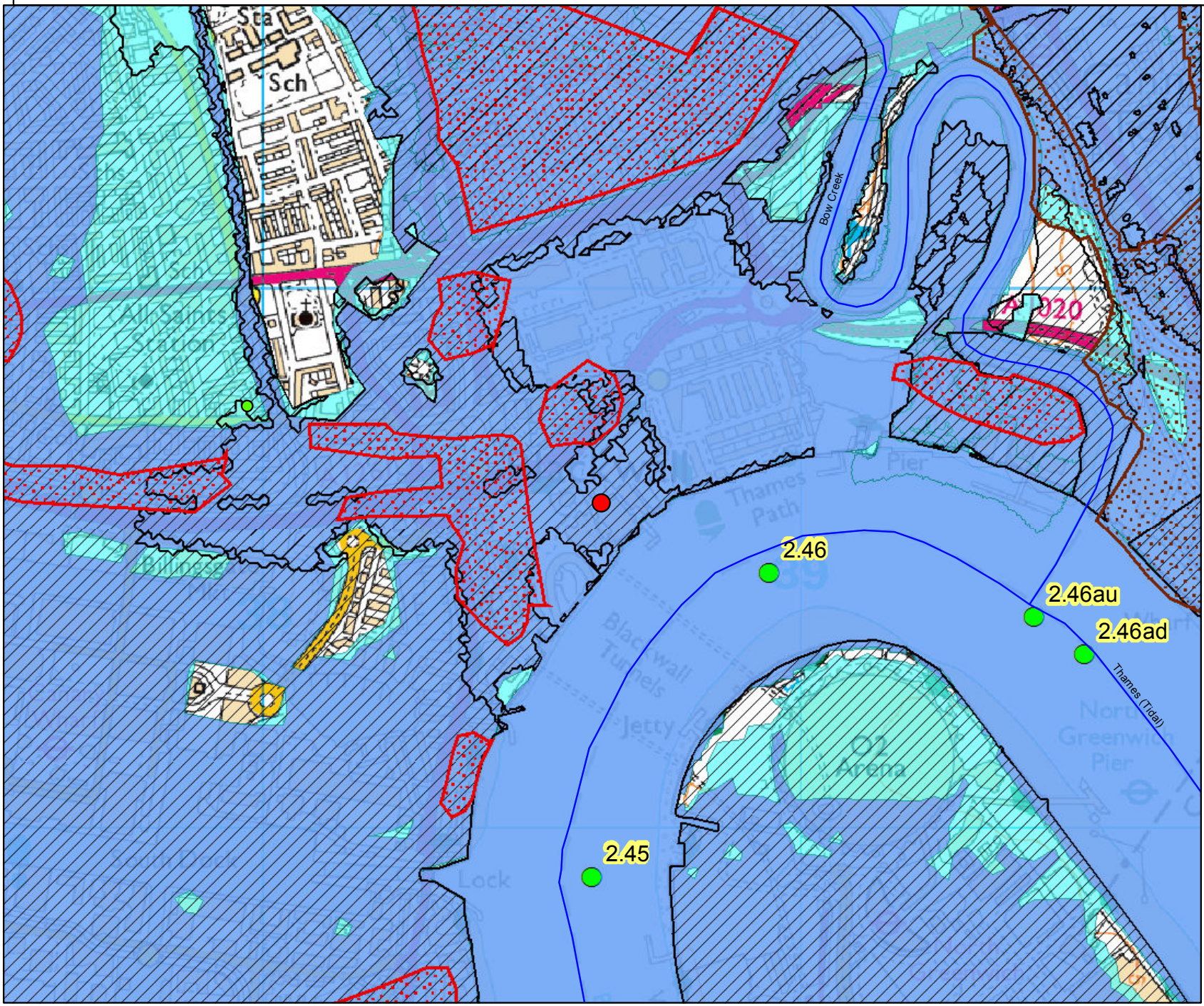
# Detailed FRA/FCA for: Blackwall Way, London E14 2EH - 05/03/2021 - HNL207506AS

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Hertfordshire,
AL7 1HE

N

0 150 300 600
Metres

## Legend

- Main Rivers
- Site location
- TE2100Nodes
- 1707 Flood Outline
- 1928 Flood Outline
- 1953 Flood Outline
- Areas Benefiting from Flood Defences
- Merged_Temp_ABD
- Flood Zone 3
- Flood Zone 2

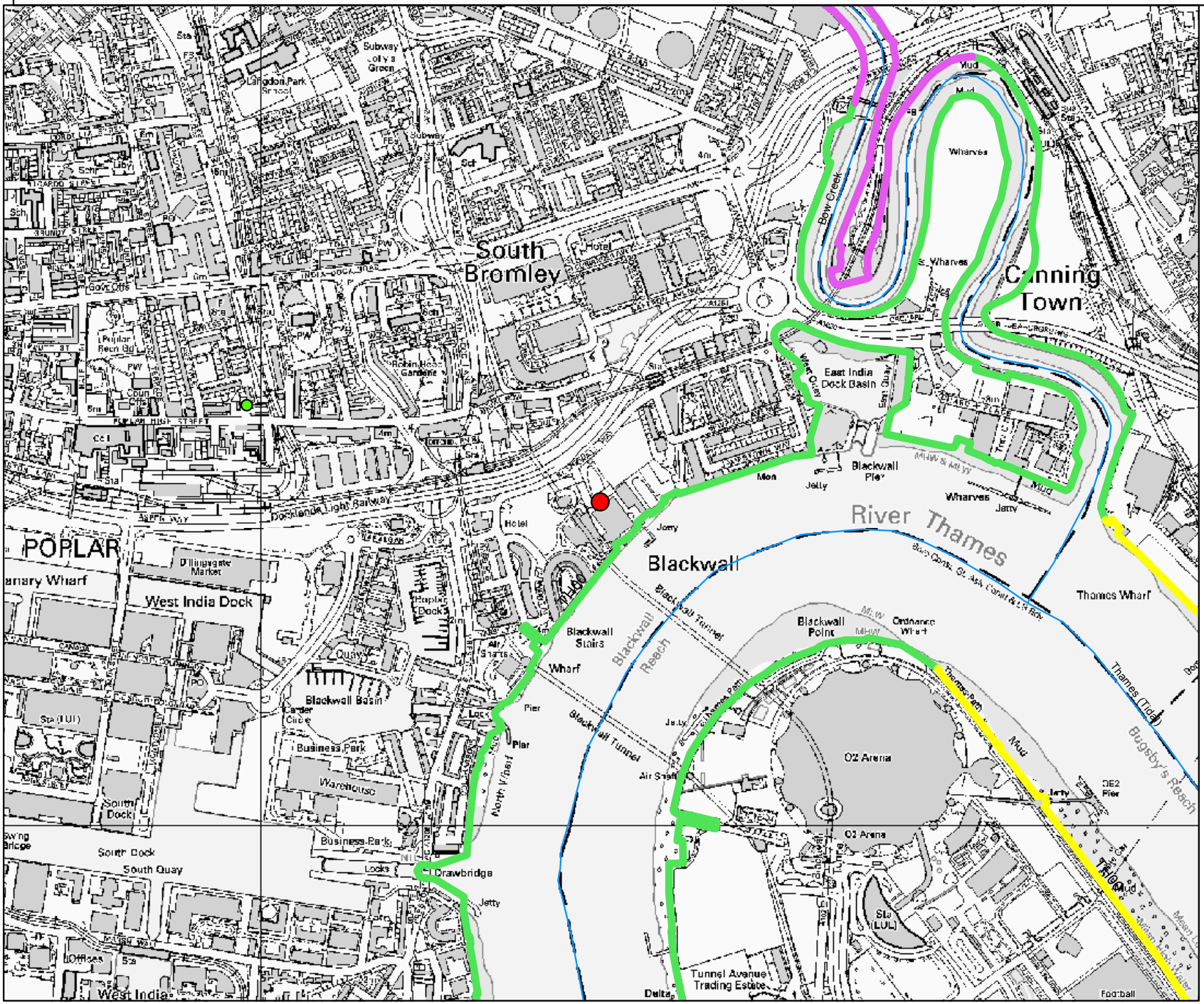
Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

# Detailed FRA/FCA for: Blackwall Way, London E14 2EH - 05/03/2021 - HNL207506AS





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AL7 1HE


N

0 150 300 600

Metres

## Legend

- Main Rivers
- Site location

**TTD Defences SDL (mAODN)**

**SDL**

- 5.18
- 5.23
- 5.28

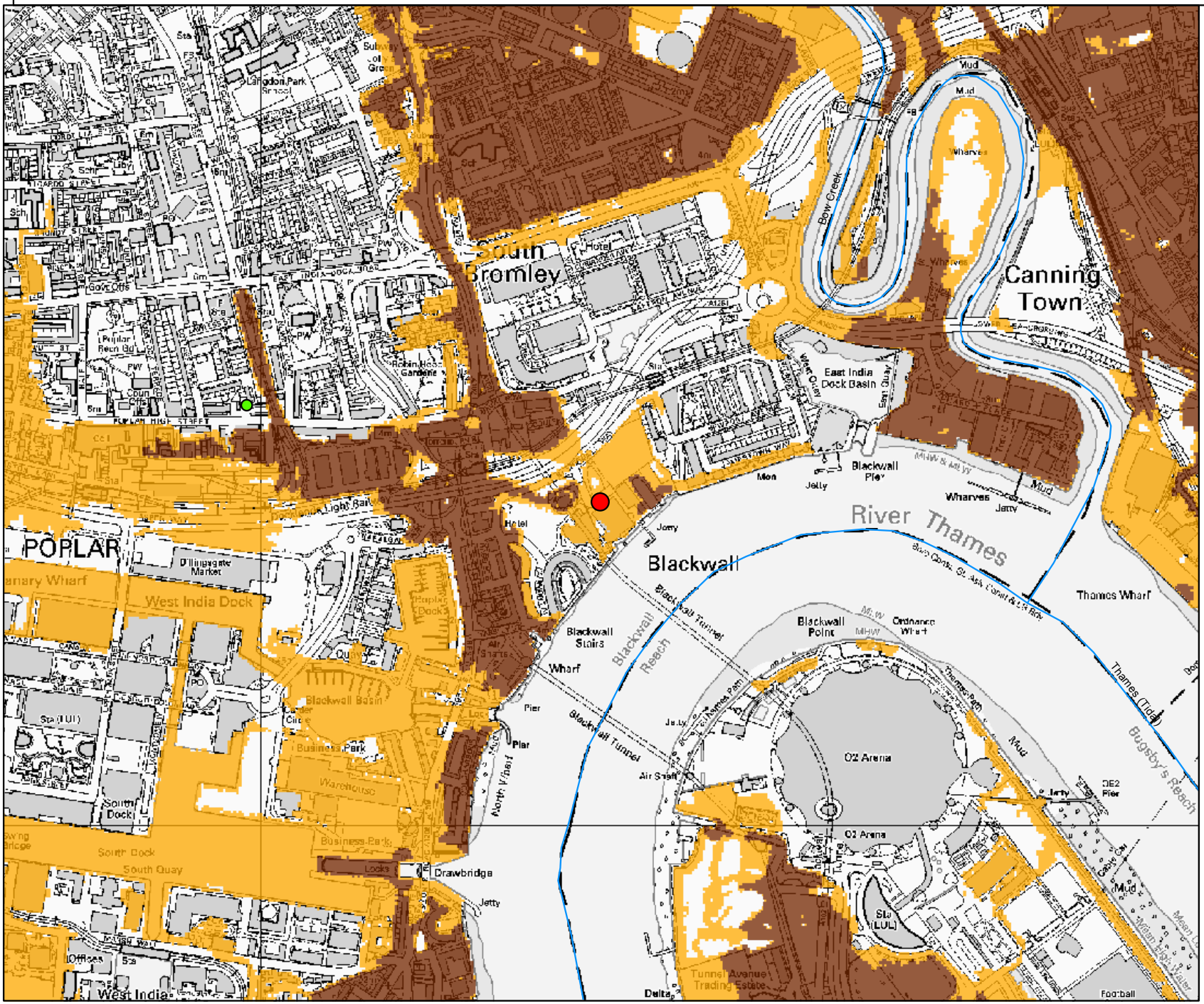
Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

# Breach Modelling Map for: Blackwall Way, London E14 2EH - 05/03/2021 - HNL207506AS





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Hertfordshire,
AL7 1HE


N

0 150 300 600

Metres

## Legend

- Main Rivers
- Site location

## Upstream Breach Outlines

### Epoch

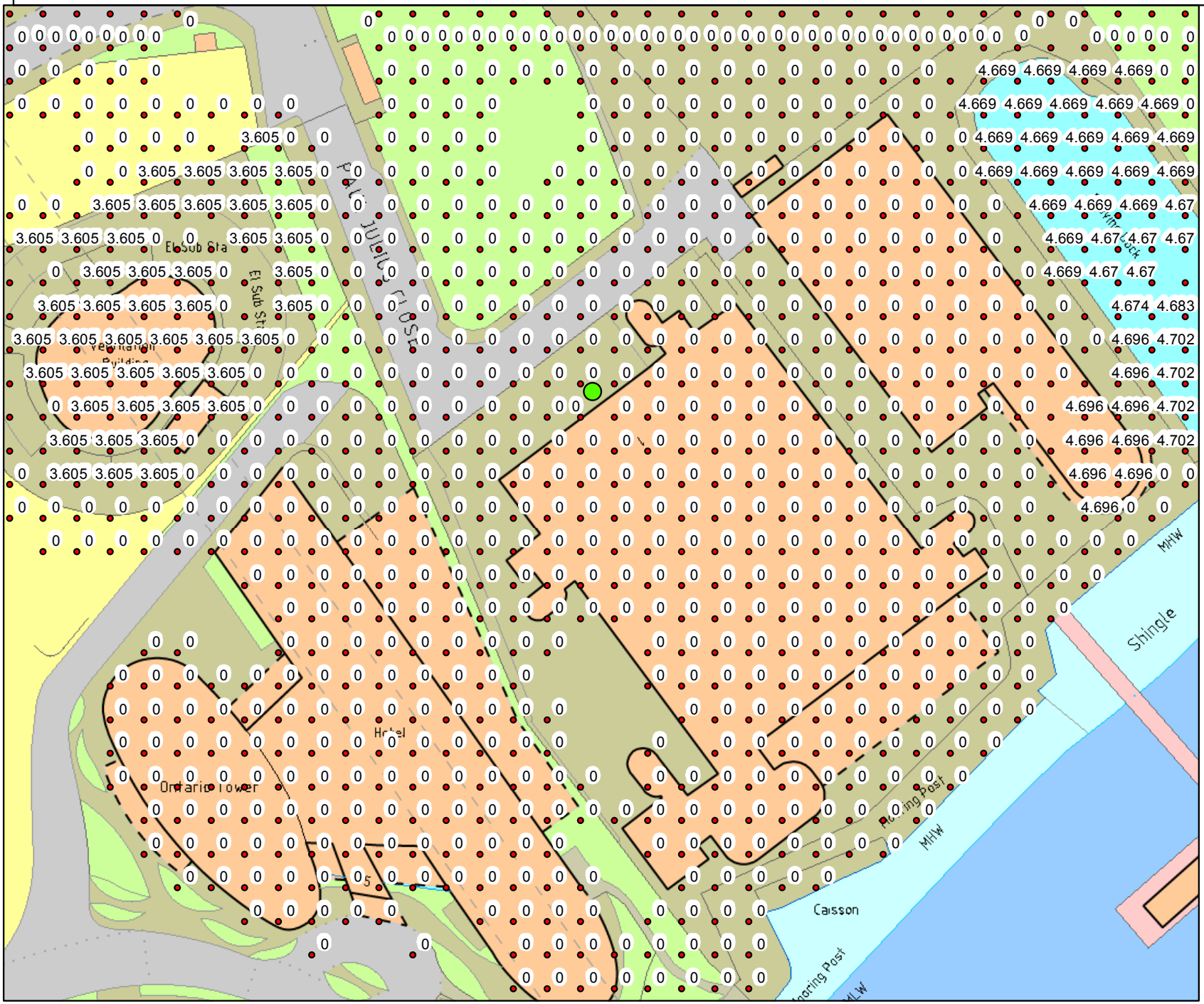
- 2005
- 2100

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.

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London

# Modelled Flood Levels For: Blackwall Way, London E14 2EH - 05/03/2021 - HNL207506AS

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Hertfordshire,
AL7 1HE

N

0 10 20 40
Metres

## Legend

- Main Rivers
- Site location

## 2D Node Results: Heights

- Tidal Breach Height (mAOD) 2005

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.

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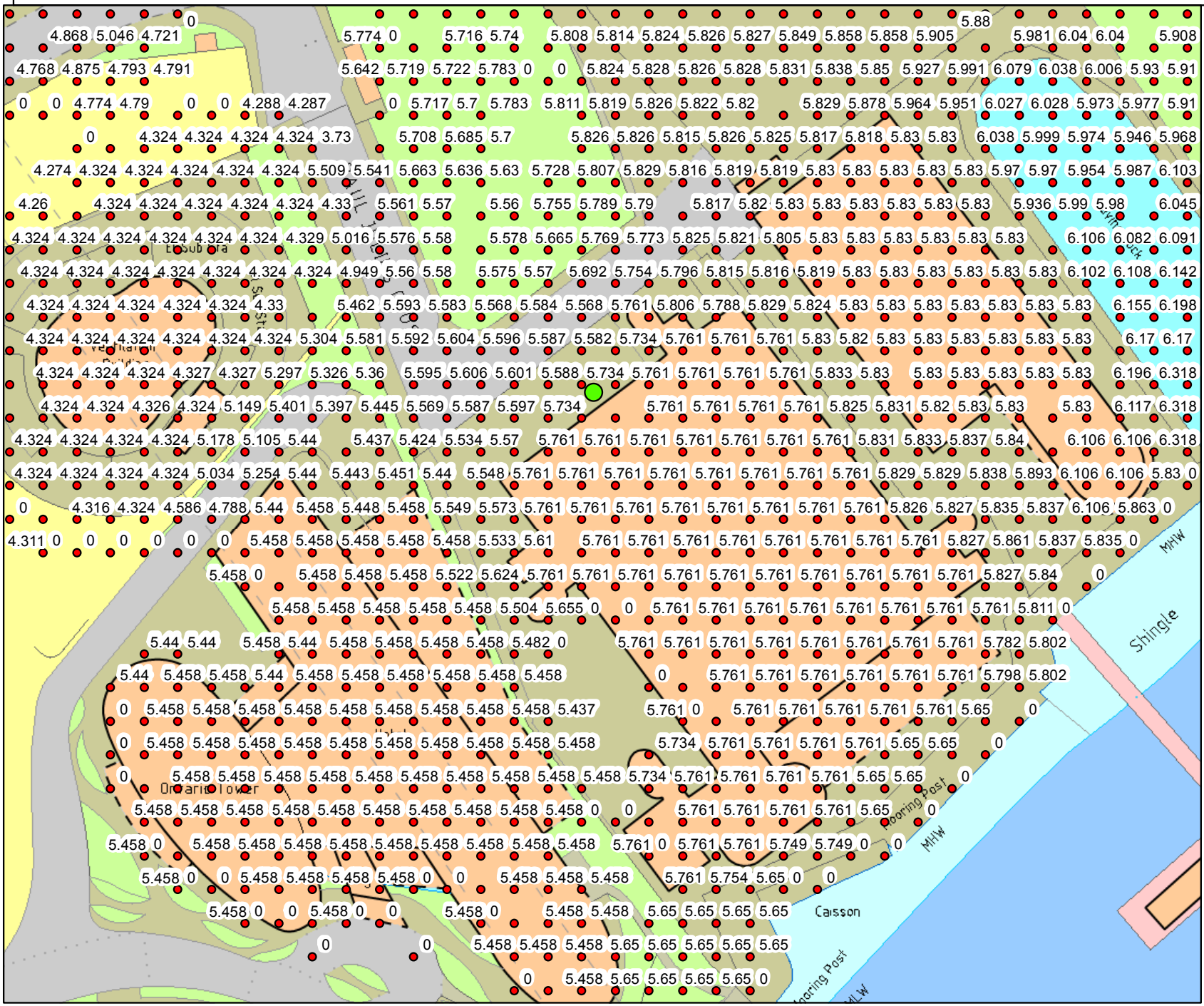
# Modelled Flood Levels For: Blackwall Way, London E14 2EH - 05/03/2021 - HNL207506AS

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N

0 10 20 40
Metres

## Legend

Main Rivers

Site location

## 2D Node Results: Heights

Tidal Breach Height (mAOD) 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.

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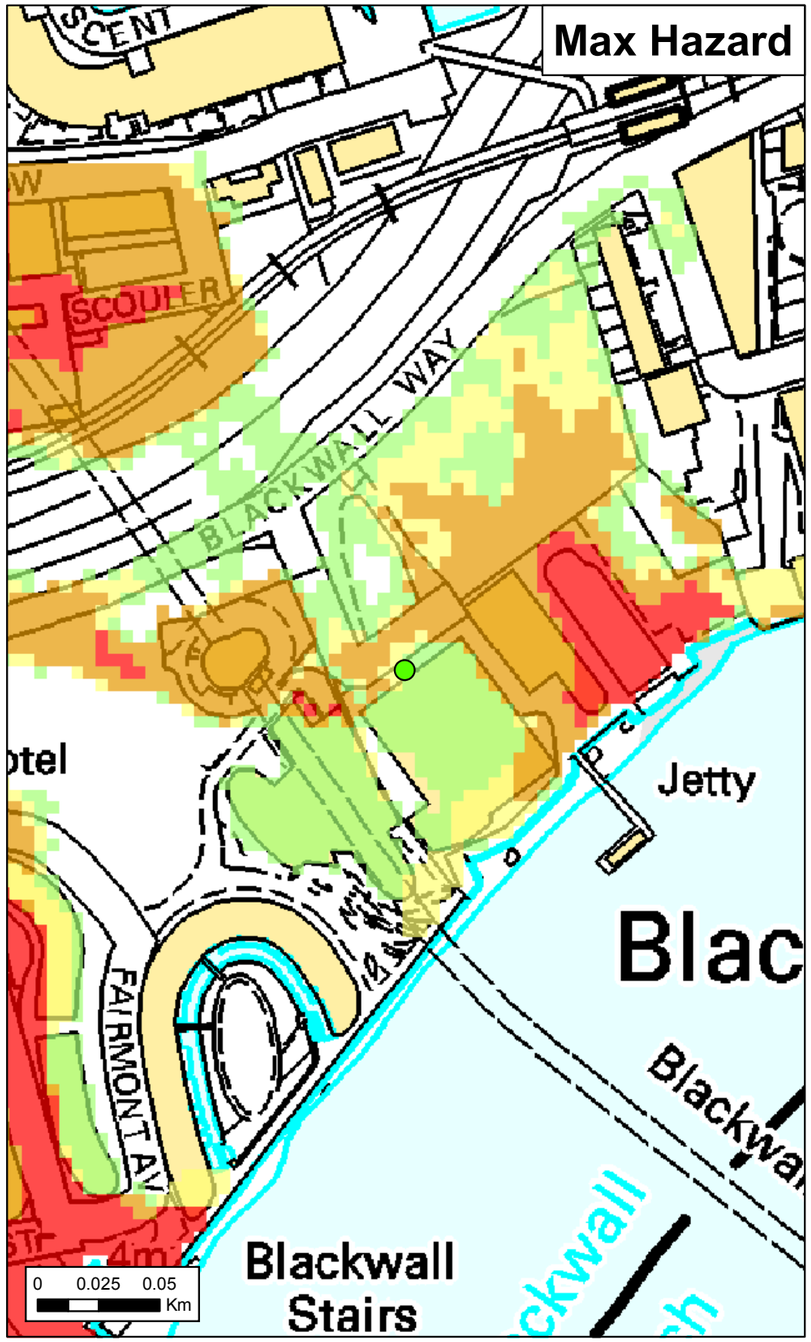


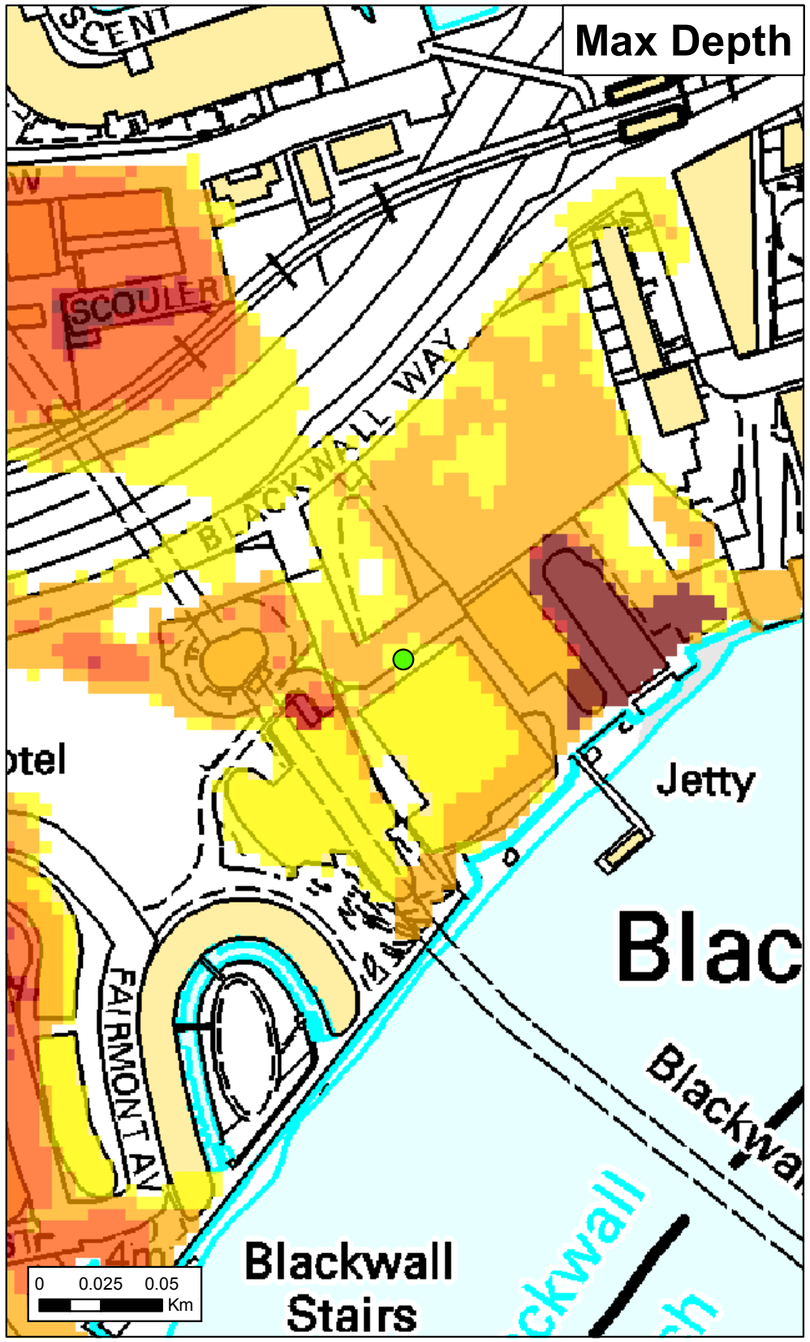


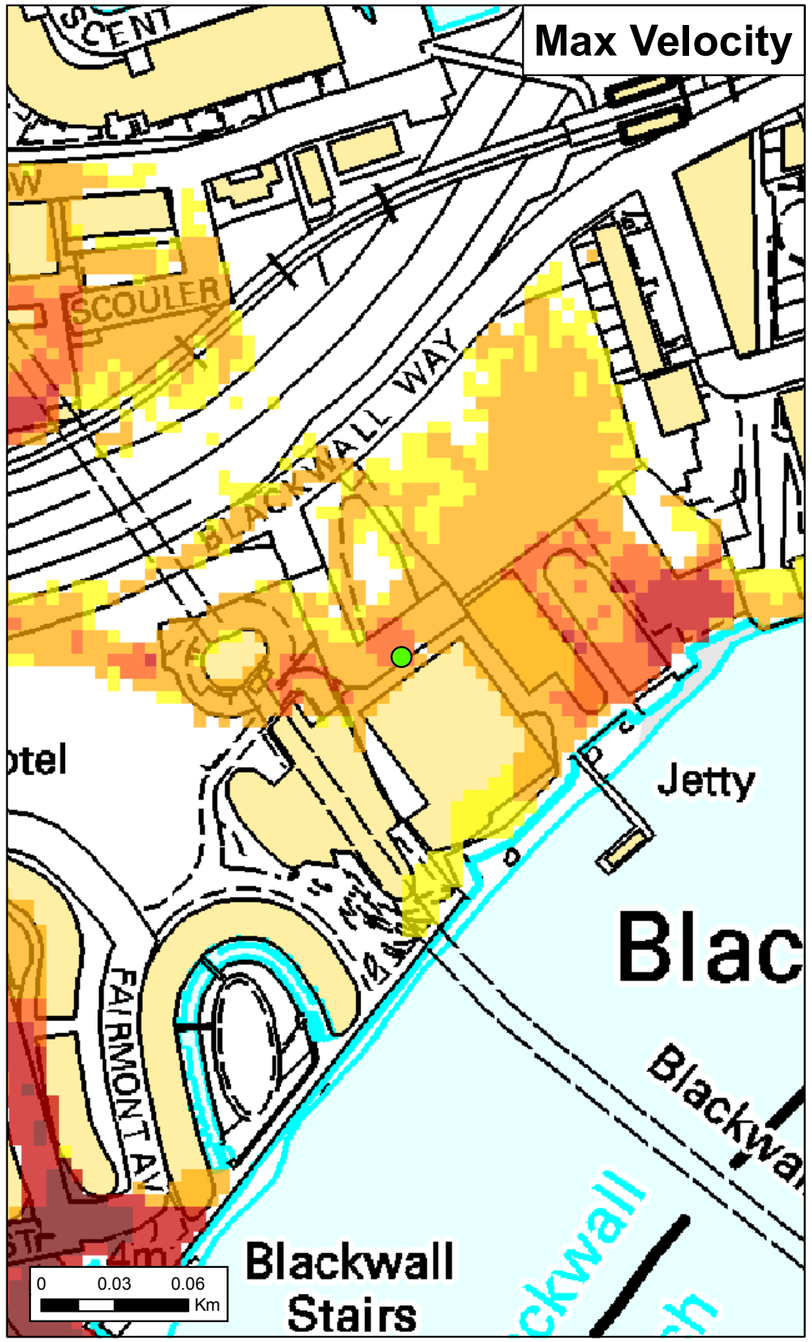


**Max Hazard**

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.00 (Danger for Most)
- Greater than 2.00 (Danger for All)

**Max Depth (m)**

- 0 - 0.25
- 0.25 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00

**Max Velocity (m/s)**

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- > 2.5

| Date Printed | 05/03/2021 | Scenario year | 2100 | Scenario Annual Chance | 0.5% (1 in 200) |
|---|---|---|---|---|---|

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.

General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

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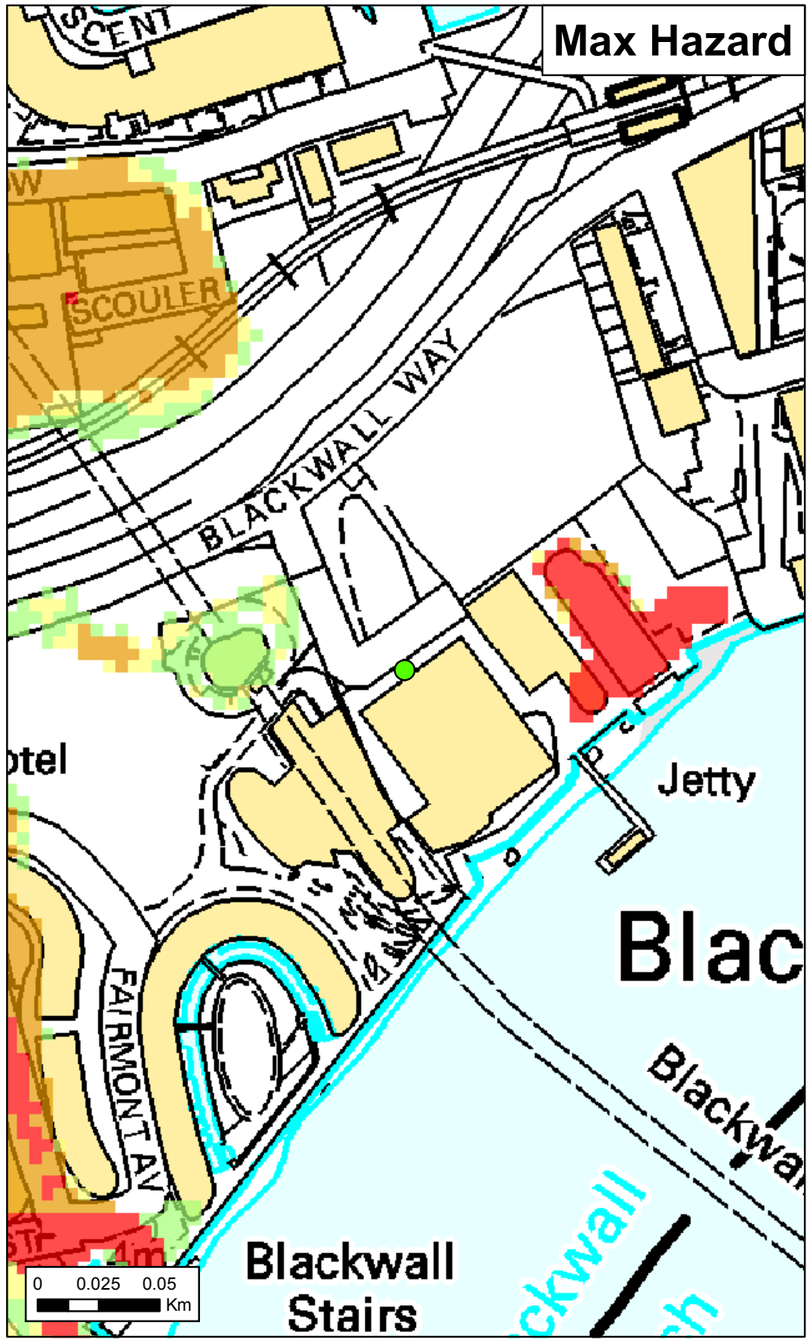
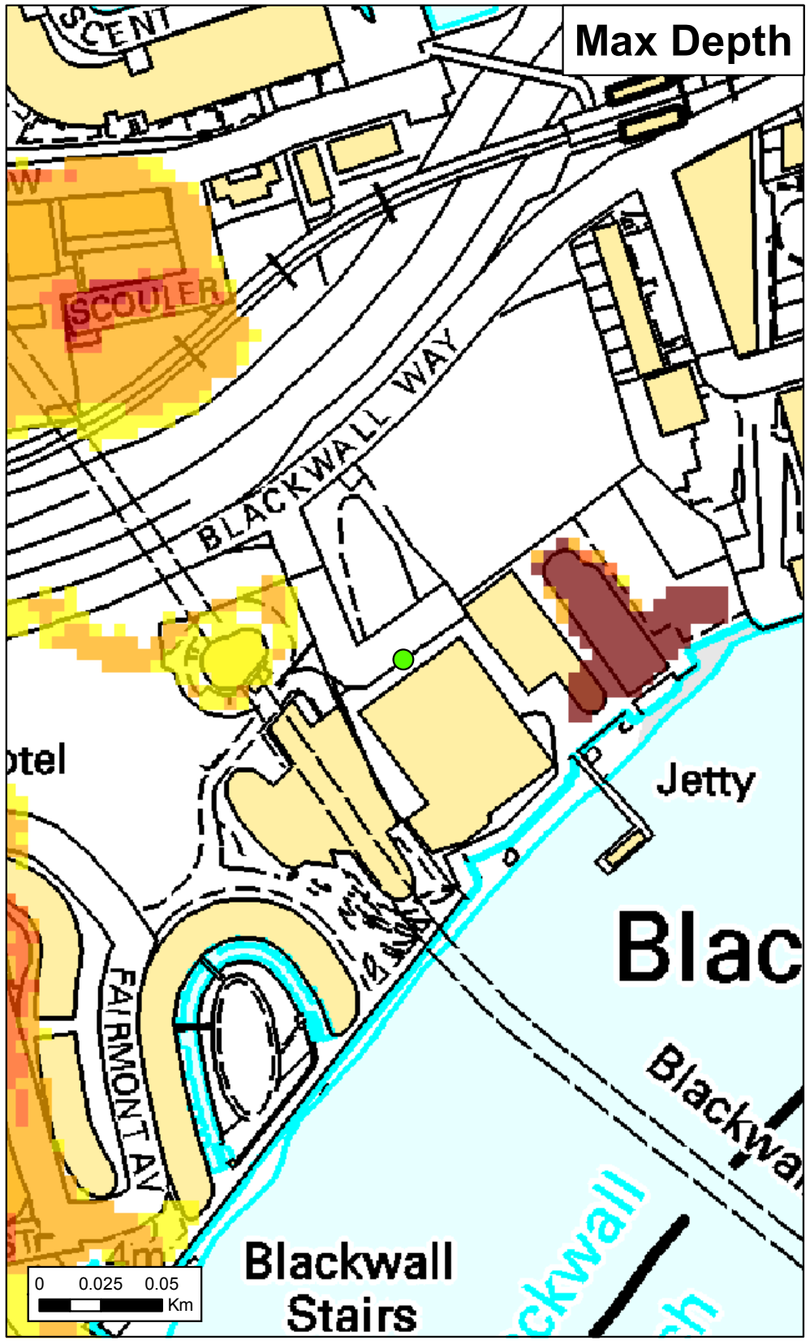
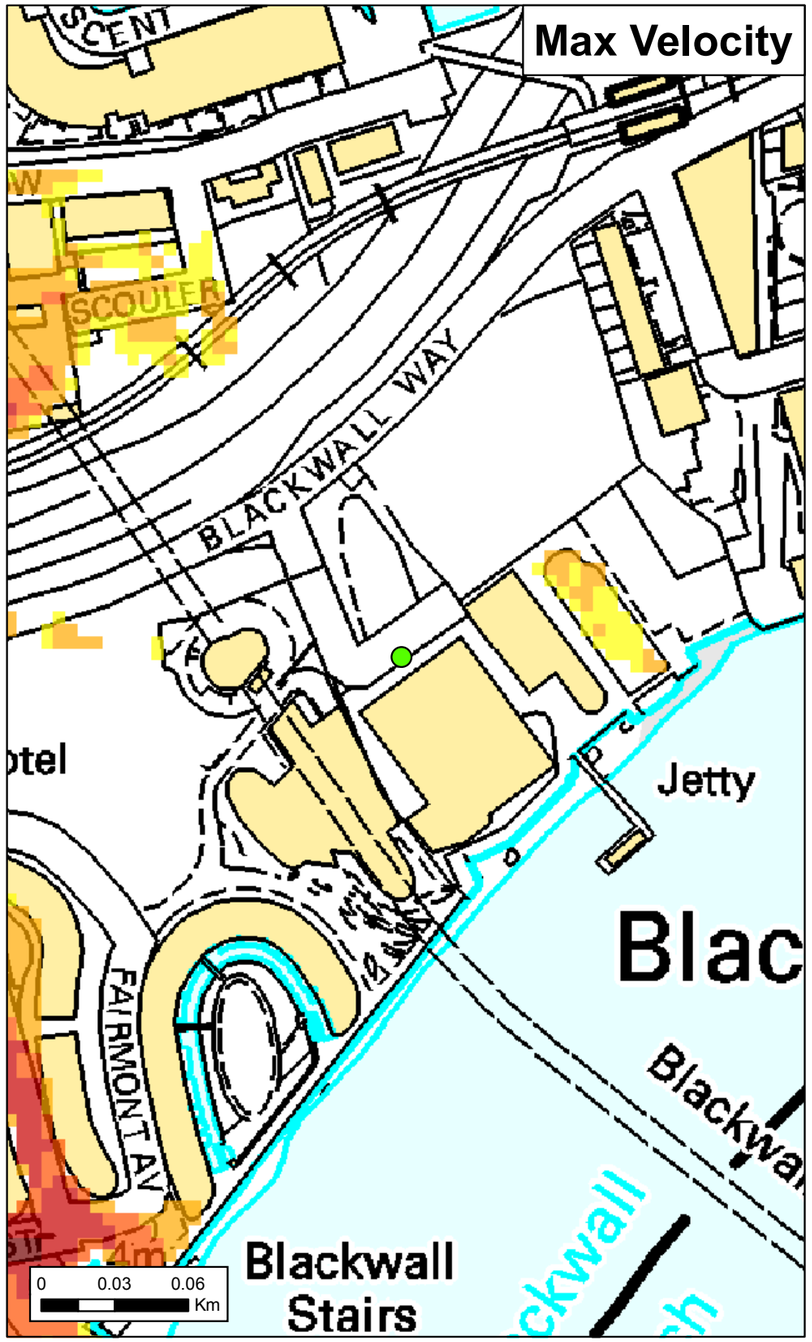
# Thames Tidal Breach Hazard Mapping

Map Centred on: 538634, 180599




**Max Hazard**

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.00 (Danger for Most)
- Greater than 2.00 (Danger for All)

**Max Depth (m)**

- 0 - 0.25
- 0.25 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00

**Max Velocity (m/s)**

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- > 2.5

| Date Printed | 05/03/2021 | Scenario year | 2005 | Scenario Annual Chance | 0.5% (1 in 200) |
|---|---|---|---|---|---|

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

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# Thames Tidal Breach Hazard Mapping

Map Centred on: 538634, 180599

## Appendix B – Utility Survey

538550_E

538600_E

538650_E

538700_E

538750_E

180750_N

180700_N

180650_N

538550_E

538600_E

538650_E

538700_E

538750_E



## STANDARD ABBREVIATIONS

| | | | |
|---|---|---|---|
| A/C | Air Conditioner | LB | Litter Bin |
| ATM | Automated Telling Machine | LP | Lamp Post |
| B | Bollard | Max | Maximum |
| BB | Belisha Beacon | Mk | Multibole |
| Bh | Borehole | MH | Manhole |
| BI | Bitumen | Min | Minimum |
| BrS | Brick Setts | Mkr | Marker |
| BRW | Brick Retaining Wall | NB | Notice Board |
| BS | Bus Stop | NP | Name Plate |
| BT | British Telecom | OBF | Open Boarded Fence |
| BW | Brick Wall | OH | Overhead |
| BWF | Barbed Wire Fence | OSBM | Ordnance Survey Bench Mark |
| CBF | Close Boarded Fence | P | Pole |
| CCTV | Closed Circuit Television | PB | Pillar Box |
| CF | Corrugated Iron Fence | PGM | Permanent Ground Marker |
| CL | Crow Level | PLI | Pavement Light |
| CLF | Chain Link Fence | PM | Parking Meter |
| Col | Column | PRF | Post and Rail Fence |
| Conc | Concrete | PS | Paving Stones |
| CoW | Cable on Wall | PWF | Post and Wire Fence |
| CPS | Concrete Paving Slabs | RE | Rodding Eye |
| CT | Cable Transmission IC | RG | Rodding Gully |
| d | depth | RS | Road Sign |
| DC | Duct Cover | RSJ | Rolled Steel Joist |
| DH | Duct Height | RWP | Rain Water Pipe |
| DP | Down Pipe | s | spread |
| DrC | Drainage Channel | SB | Sign Board |
| E/C | Electrical Inspection Cover | SBM | Site Bench Mark |
| E/J | Electrical Junction Box | SC | Stop Cock |
| EP | Electricity Pole | SF | Security Fence |
| ER | Sotling Rod | SHB | Shrub Bed |
| ESG | Electrical Switchgear | SL | Sump Level |
| FB | Flower Bed | SO | Smoke Outlet |
| FH | Fire Hydrant | SP | Sign Post |
| FL | Floor Level | SV | Stop Valve |
| FP | Flag Pole | T | Telephone |
| G | gas | Tac | Tactile Paving |
| G | Gully | TBM | Temporary Bench Mark |
| GC | Gas Cock | TCB | Telephone Call Box |
| GM | Gas Meter | TCP | Traffic Control Post |
| GP | Gate Post | TIC | Telephone Inspection Cover |
| GV | Gas Valve | TJB | Telephone Junction Box |
| H | Height | TL | Traffic Light |
| HH | Handhold | TLCB | Traffic Light Control Box |
| IB | Illuminated Bollard | TLIC | Traffic Light Inspection Cover |
| IC | Inspection Cover | TP | Telephone Pole |
| IL | Invert Level | Typ | Typical |
| IRF | Iron Railing Fence | V | Vent |
| IRS | Illuminated Road Sign | VP | Vent Pipe |
| JB | Junction Box | W | Window |
| KO | Kerb Outlet | WM | Water Meter |
| L | Light | WV | Water Valve |

## SERVICE ABBREVIATIONS

| | | | |
|---|---|---|---|
| AC | Assumed Connection | IL | Invert Level |
| AR | Assumed Route | NFI | No Further Information |
| BD | Backdrop | NPV | No Pipe Visible |
| BLK | Blocked | NSV | No Service Visible |
| CI | Cast Iron | Pd | Pipe depth |
| cog | Cable on ground | PE | Polyethylene |
| CR | Cable Riser | POG | Pipe on ground |
| D | Diameter approx. | PVC | Polyvinyl |
| Dd | Duct depth | Sfd | Silt depth |
| Em | Empty | SL | Sump Level |
| Effluent | Effluent Level | Sof | Soffit depth |
| EOT | End of Trace | SV | Stop valve |
| GV | Gas valve | UTL | Unable to Lift |
| Gas PR | Gas Pipe Riser | UTT | Unable to Trace |
| M | Invert depth | VP | Vent Pipe |

## SERVICE LEGEND

FOUL WATER
SURFACE WATER
ELECTRICITY
BRITISH TELECOM
GTT
COLT
LUMEN
VERIZON
VODAFONE
ZAYO
CCTV
EMPTY DUCTS
SCAR
WATER
GAS
UNKNOWN
CHAMBER

## UNDERGROUND SERVICES SURVEY CAVEATS

The user or recipient of the survey data understands and acknowledges that the data provided may contain errors or omissions and the user or recipient assumes full responsibility for any risks or damages resulting from, arising from or in connection with any use of the captured information.

Multiple methods of detection have been used in the location and identification of underground assets. The results are not infallible due to several factors outside of Plowman Cravens control. With any uncertainty in the provided data we strongly recommend trial excavations to be carried out to confirm exact position and depth. All reasonable effort has been made in searching available record drawings, the completeness of the underground asset drawings cannot be guaranteed.
Drainage designation is made on site from the surface via visual inspection. Any new connections or design works must obtain the correct permissions from the local Water Authority before continuing work."

With GPR anomalies located on site or from post processed data, must be deemed as a live asset until proven otherwise. GPR data is not able to identify an asset, it will solely indicate that there is an obstruction. Further information is available in the supplied UGS Survey report. This drawing must be read in conjunction with the written report.

## PAS 128 QUALITY LEVELS

QL-D Asset added from records
QL-C Asset added from site reconnaissance
QL-B Asset located horizontally remote
QL-B3P Same as "B3" including GPR data post-processing
QL-B3 Asset located horizontally by one technique only
QL-B2P Same as "B2" including GPR data post-processing
QL-B2 Asset located horizontally and vertically by one technique only
QL-B1P Same as "B1" including GPR data post-processing
QL-B1 Asset located horizontally and vertically by multiple techniques
QL-A Asset located by physical verification

Where details are recorded at inspection covers such as depths, pipes sizes, numbers of ducts etc. these are classified as QL-A

Due to the inherent instability of paper materials, drawings plotted on paper may be stretched and distorted - dimensions scaled from paper plots should therefore be treated with caution



SHEET LAYOUT




ISSUES & REVISIONS

| Issue | Details | By | Date |
|---|---|---|---|
| A | Original Issue | PCL | 12/02/21 |

Topographical detail shown in Reference layer has been taken from dwg 46169T-01A and is for context purpose only

This survey is commensurate with band F accuracy, as outlined in the RICS survey detail accuracy banding table

All levels are in metres and are above Ordnance Survey Newlyn Datum derived by multiple network RTK GPS observations

The survey grid shown on this drawing is positioned on Ordnance Survey (OS) National Grid, obtained by multiple network RTK GPS observations

Unless otherwise stated, levels have been taken to finished floor surface

All quoted dimensions are in metres

Drawing units are metres

CLIENT
CUNDALL JOHNSTON & PARTNERS LLP

4th Floor, Partnership House
Regent Farm Road
Gosforth
Newcastle Upon Tyne NE3 3AF

PROJECT TITLE

# Thomson Reuters Building
London, E14 2EH

3D Underground Services Survey

PRESENTATION SCALE 1:200 @ A0

DATE OF ORIGINAL SURVEY December 2020

PC PROJECT No. 46169-001 CHECKED PCL

DRAWING No. ISSUE

46169-001U-01-1 A

Plowman Craven

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## STANDARD ABBREVIATIONS

| | | | |
|---|---|---|---|
| A/C | Air Conditioner | LB | Litter Bin |
| ATM | Automated Telling Machine | LP | Lamp Post |
| B | Bollard | Max | Maximum |
| BB | Belisha Beacon | Mk | Multikote |
| Bh | Borehole | MH | Manhole |
| BS | Bus Stop | Min | Minimum |
| BrS | Brick Setts | Mkr | Marker |
| BRW | Brick Retaining Wall | NB | Notice Board |
| BS | Bus Stop | NP | Name Plate |
| BT | British Telecom | OBF | Open Boarded Fence |
| BW | Brick Wall | OH | Overhead |
| BWF | Barbed Wire Fence | OSBM | Ordnance Survey Bench Mark |
| CBF | Close Boarded Fence | P | Pole |
| CCTV | Closed Circuit Television | PB | Pillar Box |
| CF | Corrugated Iron Fence | PGM | Permanent Ground Marker |
| CL | Cover Level | PLI | Pavement Light |
| CLF | Chain Link Fence | PM | Parking Meter |
| Col | Column | PRF | Post and Rail Fence |
| Conc | Concrete | PS | Paving Stones |
| CoW | Cable on Wall | PWF | Post and Wire Fence |
| CPS | Concrete Paving Slabs | RE | Rodding Eye |
| CSC | Cast Concrete IC | RF | Railway Fence |
| d | depth | RS | Road Sign |
| DC | Duct Cover | RSJ | Rolled Steel Joist |
| DH | Duct Height | RWP | Rain Water Pipe |
| DP | Down Pipe | s | spread |
| DrC | Drainage Channel | SB | Sign Board |
| E/C | Electrical Inspection Cover | SBM | Site Bench Mark |
| EB | Electricity Distribution Box | SC | Stop Cock |
| EP | Electricity Pole | SF | Security Fence |
| ER | Sliding Rod | SNB | Shrub Bed |
| ESG | Electrical Switchgear | SL | Sump Level |
| FB | Flower Bed | SO | Smoke Outlet |
| FH | Fire Hydrant | SP | Sign Post |
| FL | Floor Level | SV | Stop Valve |
| FP | Flag Pole | T | Telephone |
| G | grate | Tac | Tactile Paving |
| G | Gully | TBM | Temporary Bench Mark |
| GC | Gas Cock | TCB | Telephone Call Box |
| GM | Gas Meter | TCP | Traffic Control Post |
| GP | Gate Post | TIC | Telephone Inspection Cover |
| GV | Gas Valve | TJB | Telephone Junction Box |
| HH | Hand Hole | TL | Traffic Light |
| HR | Handrail | TLCB | Traffic Light Control Box |
| IB | Illuminated Bollard | TLIC | Traffic Light Inspection Cover |
| IC | Inspection Cover | TP | Telephone Pole |
| IL | Invert Level | Typ | Typical |
| IRF | Iron Railing Fence | V | Vent |
| IRS | Illuminated Road Sign | VP | Vent Pipe |
| JB | Junction Box | W | Window |
| KO | Kerb Outlet | WM | Water Meter |
| L | Light | WV | Water Valve |

## SERVICE ABBREVIATIONS

| | | | |
|---|---|---|---|
| AC | Assumed Connection | IL | Invert Level |
| AR | Assumed Route | NFI | No Further Information |
| BD | Backdrop | NPV | No Pipe Visible |
| BLK | Blocked | NSV | No Service Visible |
| CI | Cast Iron | Pd | Pipe depth |
| cvg | Cable on ground | PE | Polyethylene |
| CR | Cable Riser | POG | Pipe on ground |
| D | Diameter approx. | PVC | Polyvinyl |
| DH | Duct depth | SBd | Silt depth |
| (e) | Empty | SL | Sump Level |
| Effluent | Effluent Level | Sof | Soffit depth |
| EOT | End of Trace | SV | Stop valve |
| GV | Gas valve | UTL | Unable to Lift |
| Gas PR | Gas Pipe Riser | UTT | Unable to Trace |
| M | Invert depth | VP | Vent Pipe |

## SERVICE LEGEND

FOUL WATER
SURFACE WATER
ELECTRICITY
BRITISH TELECOM
GTT
COLT
LUMEN
VERIZON
VODAFONE
ZAYO
CCTV
EMPTY DUCTS
SCAR
WATER
GAS
UNKNOWN
CHAMBER

## UNDERGROUND SERVICES SURVEY CAVEATS

The user or recipient of the survey data understands and acknowledges that the data provided may contain errors or omissions and the user or recipient assumes full responsibility for any risks or damages resulting from, arising from or in connection with any use of the captured information.

Multiple methods of detection have been used in the location and identification of underground assets. The results are not infallible due to several factors outside of Plowman Cravens control. With any uncertainty in the provided data we strongly recommend trial excavations to be carried out to confirm exact position and depth. All reasonable effort has been made in searching available record drawings, the completeness of the underground asset drawings cannot be guaranteed.
Drainage designation is made on site from the surface via visual inspection. Any new connections or design works must obtain the correct permissions from the local Water Authority before continuing work."

With GPR anomalies located on site or from post processed data, must be deemed as a live asset until proven otherwise. GPR data is not able to identify an asset, it will solely indicate that there is an obstruction. Further information is available in the supplied UGS Survey report. This drawing must be read in conjunction with the written report.

## PAS 128 QUALITY LEVELS

QL-D Asset added from records
QL-C Asset added from site reconnaissance
QL-B4 Asset shown as assumed route
QL-B3P Same as "B3" including GPR data post-processing
QL-B3 Asset located horizontally by one technique only
QL-B2P Same as "B2" including GPR data post-processing
QL-B2 Asset located horizontally and vertically by one technique only
QL-B1P Same as "B1" including GPR data post-processing
QL-B1 Asset located horizontally and vertically by multiple techniques
QL-A Asset located by physical verification

Where details are recorded at inspection covers such as depths, pipes sizes, numbers of ducts etc. these are classified as QL-A



## SHEET LAYOUT




## ISSUES & REVISIONS

| Issue | Details | By | Date |
|---|---|---|---|
| A | Original Issue | PCL | 12/02/21 |

Topographical detail shown in Reference layer has been taken from dwg 46169T-01A and is for context purpose only

This survey is commensurate with band F accuracy, as outlined in the RICS survey detail accuracy banding table

All levels are in metres and are above Ordnance Survey Newlyn Datum derived by multiple network RTK GPS observations

The survey grid shown on this drawing is positioned on Ordnance Survey (OS) National Grid, obtained by multiple network RTK GPS observations

Unless otherwise stated, levels have been taken to finished floor surface

All quoted dimensions are in metres

Drawing units are metres

CLIENT
CUNDALL JOHNSTON & PARTNERS LLP

4th Floor, Partnership House
Regent Farm Road
Gosforth
Newcastle Upon Tyne NE3 3AF

PROJECT TITLE

# Thomson Reuters Building
London, E14 2EH

3D Underground Services Survey

PRESENTATION SCALE 1:200 @ A0

DATE OF ORIGINAL SURVEY December 2020

PC PROJECT No.46169-001 CHECKED PCL

DRAWING No. ISSUE

46169-001U-01-2 A

Plowman Craven

Plowman Craven House
2 Lea Business Park
Lower Luton Road
Harpenden
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115 Southwark Bridge Road
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SE1 0AX
Tel: +44 (0)207 490 7700

Email: post@plowmancraven.co.uk
Web: www.plowmancraven.co.uk

## Appendix C – Thames Water Asset search records

# Asset location search

Property Searches

Apogee
Hall Park CourtHall Park Way
TELFORD
TELFORD
TF1 3PT

**Search address supplied** Thomson Reuters Ltd
1
Paul Julius Close
London
E14 2EH

**Your reference** 421757

**Our reference** ALS/ALS Standard/2020_4325363

**Search date** 16 December 2020

## Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

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

# Asset location search

Property Searches

**Search address supplied:** Thomson Reuters Ltd, 1, Paul Julius Close, London, E14 2EH

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

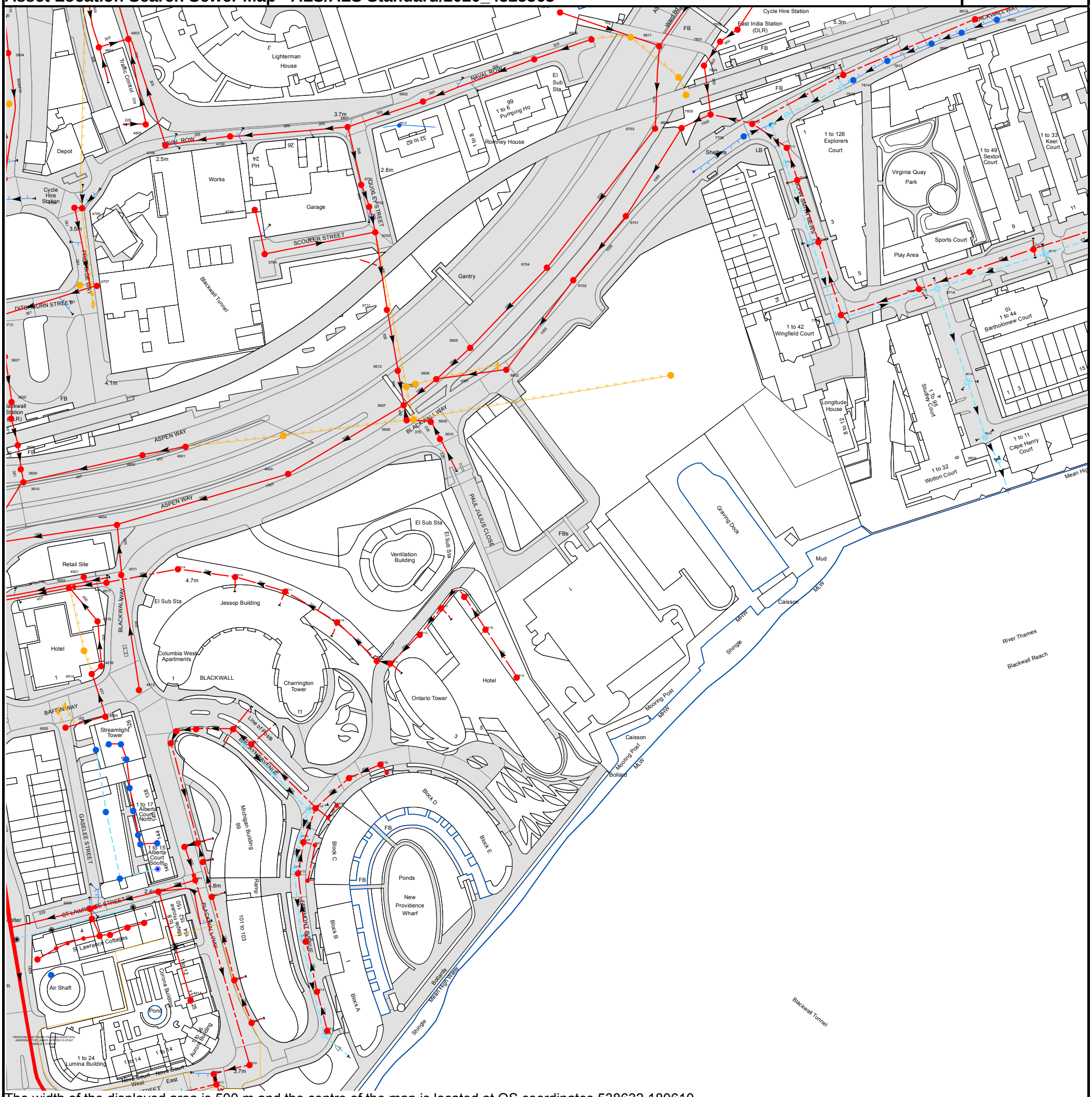
### Clean Water queries

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/2020_4325363




The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 538632,180610

**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 |
|---|---|---|
| 4804 | n/a | n/a |
| 4803 | n/a | n/a |
| 4805 | n/a | n/a |
| 4708 | n/a | n/a |
| 4709 | n/a | n/a |
| 4710 | 2.03 | 1.1 |
| 5704 | 2.14 | 1.06 |
| 5801 | 3.54 | 1.4 |
| 5701 | 2.78 | .45 |
| 5702 | 2.47 | .2 |
| 5703 | n/a | n/a |
| 581A | n/a | n/a |
| 5802 | 4.57 | 1.98 |
| 6801 | 5.42 | 2.18 |
| 6704 | n/a | n/a |
| 6812 | n/a | n/a |
| 6809 | n/a | n/a |
| 6701 | n/a | n/a |
| 6703 | n/a | n/a |
| 6811 | n/a | n/a |
| 6810 | n/a | n/a |
| 7804 | n/a | n/a |
| 7805 | n/a | n/a |
| 7803 | n/a | n/a |
| 7802 | n/a | n/a |
| 7708 | 5.54 | 3.932 |
| 781D | 5.472 | .332 |
| 3702 | n/a | -4.91 |
| 3804 | n/a | n/a |
| 4706 | n/a | n/a |
| 4705 | n/a | n/a |
| 781A | 5.322 | 2.472 |
| 771F | 5.01 | 2.32 |
| 771G | 5.027 | .627 |
| 781C | 5.364 | 2.513 |
| 771D | 4.922 | .742 |
| 771C | 5.837 | 2.077 |
| 771E | 5.897 | 1.107 |
| 771B | 7.502 | 1.952 |
| 771A | 7.497 | 1.447 |
| 781B | 5.85 | 2.7 |
| 781E | 5.6 | 2.25 |
| 7814 | 5.677 | 2.943 |
| 7813 | 5.902 | 3.093 |
| 871C | 7.934 | 1.884 |
| 8807 | 6.054 | 3.238 |
| 871A | 8.13 | 1.695 |
| 8806 | n/a | n/a |
| 861B | 6.662 | 1.512 |
| 871B | 8.198 | 2.148 |
| 881A | n/a | n/a |
| 861A | 6.982 | 1.452 |
| 8805 | n/a | n/a |
| 8604 | 6.877 | .877 |
| 871E | 8.448 | 2.498 |
| 871D | 8.448 | 1.828 |
| 551G | n/a | n/a |
| 651B | n/a | n/a |
| 551K | n/a | n/a |
| 4515 | 3.35 | -1.73 |
| 551F | n/a | n/a |
| 551E | n/a | n/a |
| 551J | n/a | n/a |
| 4517 | 3.6 | 2.2 |
| 451G | n/a | n/a |
| 4501 | 3.53 | -.5 |
| 4511 | n/a | n/a |
| 461A | n/a | n/a |
| 4604 | n/a | n/a |
| 4603 | n/a | n/a |
| 4602 | 3.21 | -1.03 |
| 4601 | 3.25 | -1.3 |
| 5610 | n/a | n/a |
| 5609 | n/a | n/a |
| 5608 | n/a | n/a |
| 5607 | n/a | n/a |
| 5606 | n/a | n/a |
| 5612 | n/a | n/a |
| 6602 | n/a | n/a |
| 5605 | n/a | n/a |
| 5711 | n/a | n/a |
| 4707 | n/a | n/a |
| 6702 | n/a | n/a |
| 4502 | 2.77 | -1.93 |
| 3610 | 3.58 | -1.55 |
| 3609 | 3.78 | -1.29 |
| 3608 | 2.91 | -1.19 |
| 3621 | n/a | n/a |
| 3620 | n/a | n/a |
| 3607 | 2.61 | -.86 |
| 541M | n/a | n/a |

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|---|---|---|
| 44DA | n/a | n/a |
| 551C | n/a | n/a |
| 551A | n/a | n/a |
| 551D | n/a | n/a |
| 551B | n/a | n/a |
| 45BC | n/a | n/a |
| 45BG | n/a | n/a |
| 451F | n/a | n/a |
| 45BD | n/a | n/a |
| 45BE | n/a | n/a |
| 451E | n/a | n/a |
| 451A | 2.89 | 1.77 |
| 451B | 2.95 | 1.8 |
| 451C | 3.32 | 1.84 |
| 451D | n/a | 1.91 |
| 4505 | 1.56 | -.74 |
| 4504 | 2.65 | -1.23 |
| 4512 | n/a | n/a |
| 651A | n/a | n/a |
| 4514 | 2.65 | -1.44 |
| 4516 | 2.75 | -1.52 |
| 551H | n/a | n/a |
| 551I | n/a | n/a |
| 44CG | n/a | n/a |
| 4405 | 2.34 | -.26 |
| 4403 | 2.99 | 1.47 |
| 441A | n/a | -.05 |
| 4404 | 3.01 | .96 |
| 441B | 3.27 | 1.52 |
| 441C | 3.15 | 1.74 |
| 441D | 3.18 | 1.98 |
| 4308 | 3.15 | .7 |
| 431C | 3.221 | .606 |
| 441E | 3.53 | 2.26 |
| 431D | n/a | n/a |
| 531A | 3.78 | 2.4 |
| 541E | n/a | n/a |
| 541D | n/a | n/a |
| 541G | n/a | n/a |
| 541C | n/a | n/a |
| 541F | n/a | n/a |
| 541B | n/a | n/a |
| 541K | n/a | n/a |
| 541I | n/a | n/a |
| 541J | n/a | n/a |
| 541H | n/a | n/a |
| 541A | n/a | n/a |
| 531B | n/a | n/a |
| 531C | n/a | n/a |
| 541L | n/a | n/a |
| 34AE | n/a | n/a |
| 44CF | n/a | n/a |
| 44CA | n/a | n/a |
| 44CB | n/a | n/a |
| 44CC | n/a | n/a |
| 4406 | 1.79 | -1.52 |
| 44BI | n/a | n/a |
| 44BH | n/a | n/a |
| 44DD | n/a | n/a |
| 44BG | n/a | n/a |
| 44DC | n/a | n/a |
| 44BF | n/a | n/a |
| 44CJ | n/a | n/a |
| 44CI | n/a | n/a |
| 44CH | n/a | n/a |
| 44BE | 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

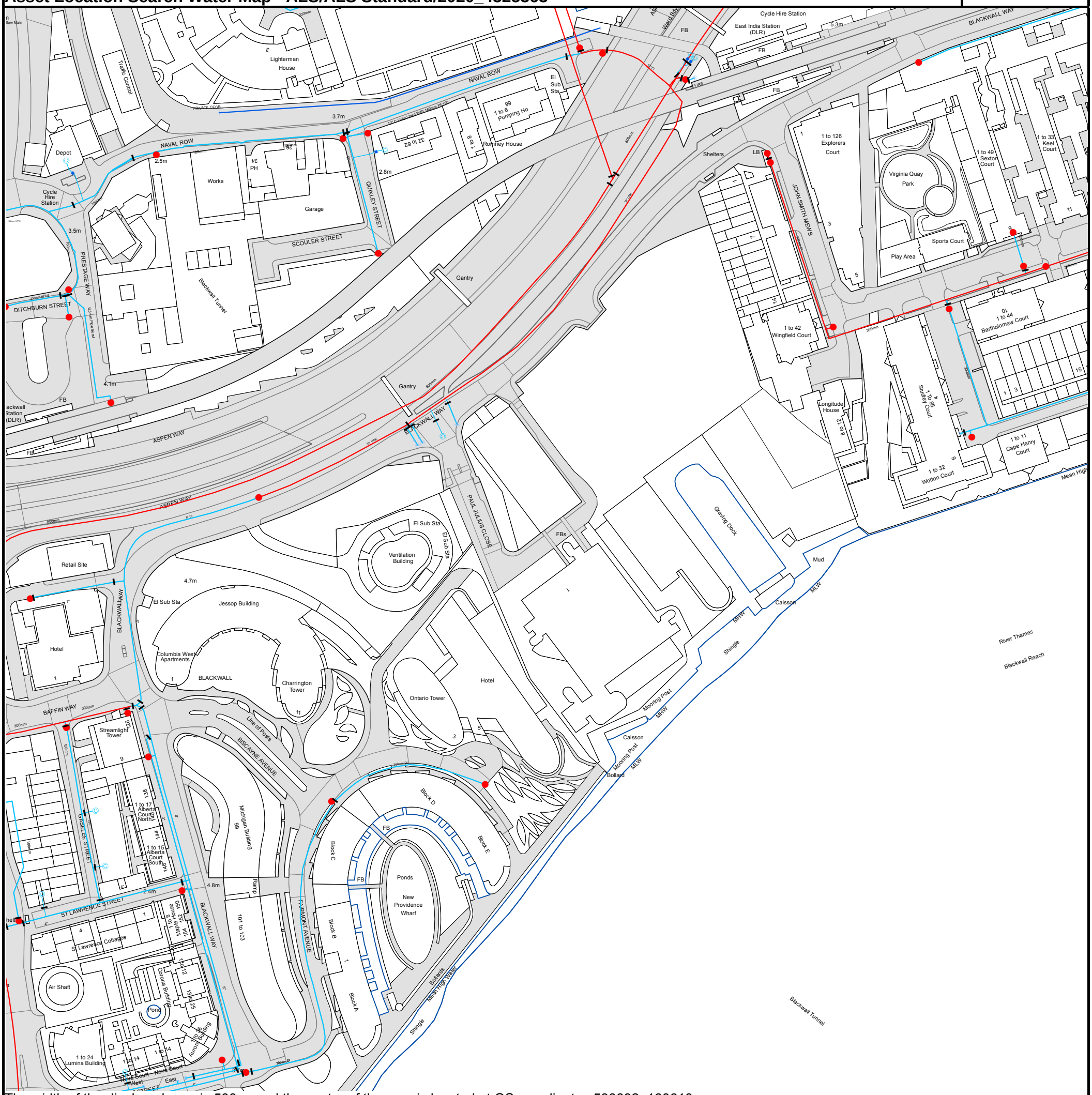
## Other Sewer Types (Not Operated or Maintained by Thames Water)

- 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/2020_4325363




The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 538632, 180610.

# 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**<br>Sort code **60-00-01**<br>A remittance advice must be sent to:<br>**Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.**<br>or email **ps.billing@thameswater.co.uk** | By calling your bank and quoting:<br>Account number **90478703**<br>Sort code **60-00-01**<br>and your invoice number | Made payable to '**Thames Water Utilities Ltd**'<br>Write your Thames Water account number on the back.<br>Send to:<br>**Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW**<br>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.

## Appendix D – MicroDrainage results

## Summary of Critical Results by Maximum Level (Rank 1) for Storm 1

### Simulation Criteria

| | | | |
|---|---|---|---|
| Areal Reduction Factor | 1.000 | Additional Flow - % of Total Flow | 0.000 |
| Hot Start (mins) | 0 | MADD Factor * 10m³/ha Storage | 2.000 |
| Hot Start Level (mm) | 0 | Inlet Coeffiecient | 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 | Flow per Person per Day (l/per/day) | 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | | |

| | | | |
|---|---|---|---|
| Number of Input Hydrographs | 0 | Number of Storage Structures | 0 |
| Number of Online Controls | 0 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | FSR | Ratio R | 0.450 |
| Region | England and Wales | Cv (Summer) | 0.750 |
| M5-60 (mm) | 20.000 | Cv (Winter) | 0.840 |

| | | | |
|---|---|---|---|
| Margin for Flood Risk Warning (mm) | 300.0 | DVD Status | OFF |
| Analysis Timestep | Fine | Inertia Status | OFF |
| DTS Status | ON | | |

| | |
|---|---|
| Profile(s) | Summer and Winter |
| Duration(s) (mins) | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080 |
| Return Period(s) (years) | 1, 30, 100 |
| Climate Change (%) | 0, 0, 40 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|---|---|---|---|---|---|---|---|---|---|
| S1.000 | Ssw157 | 15 Winter | 100 | +40% | | | | | 3.687 |
| S1.001 | Ssw150 | 15 Winter | 100 | +40% | | | | | 3.685 |
| S1.002 | Ssw14 | 15 Winter | 100 | +40% | | | | | 3.673 |
| S2.000 | Ssw115 | 15 Winter | 100 | +40% | 30/15 Summer | | | | 5.731 |
| S2.001 | Ssw116 | 15 Winter | 100 | +40% | 30/15 Summer | | | | 5.624 |
| S2.002 | Ssw113 | 15 Winter | 100 | +40% | 1/15 Winter | | | | 4.627 |
| S2.003 | Ssw112 | 15 Winter | 100 | +40% | | | | | 3.841 |
| S1.003 | Ssw13 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.668 |
| S3.000 | Ssw96 | 15 Winter | 100 | +40% | | | | | 4.830 |
| S4.000 | Ssw87 | 15 Winter | 100 | +40% | | | | | 4.826 |
| S3.001 | Ssw93 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 4.780 |
| S3.002 | Ssw95 | 15 Winter | 100 | +40% | 30/15 Winter | | | | 4.519 |
| S3.003 | Ssw86 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 4.072 |
| S1.004 | S5 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.634 |
| S1.005 | Ssw12 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.604 |
| S5.000 | Ssw68 | 15 Winter | 100 | +40% | | | | | 3.707 |
| S5.001 | Ssw64 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.667 |
| S5.002 | Ssw78 | 15 Winter | 100 | +40% | 100/15 Winter | | | | 3.644 |
| S1.006 | Ssw53 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.534 |
| S6.000 | Ssw9 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 5.400 |

## Summary of Critical Results by Maximum Level (Rank 1) for Storm 1

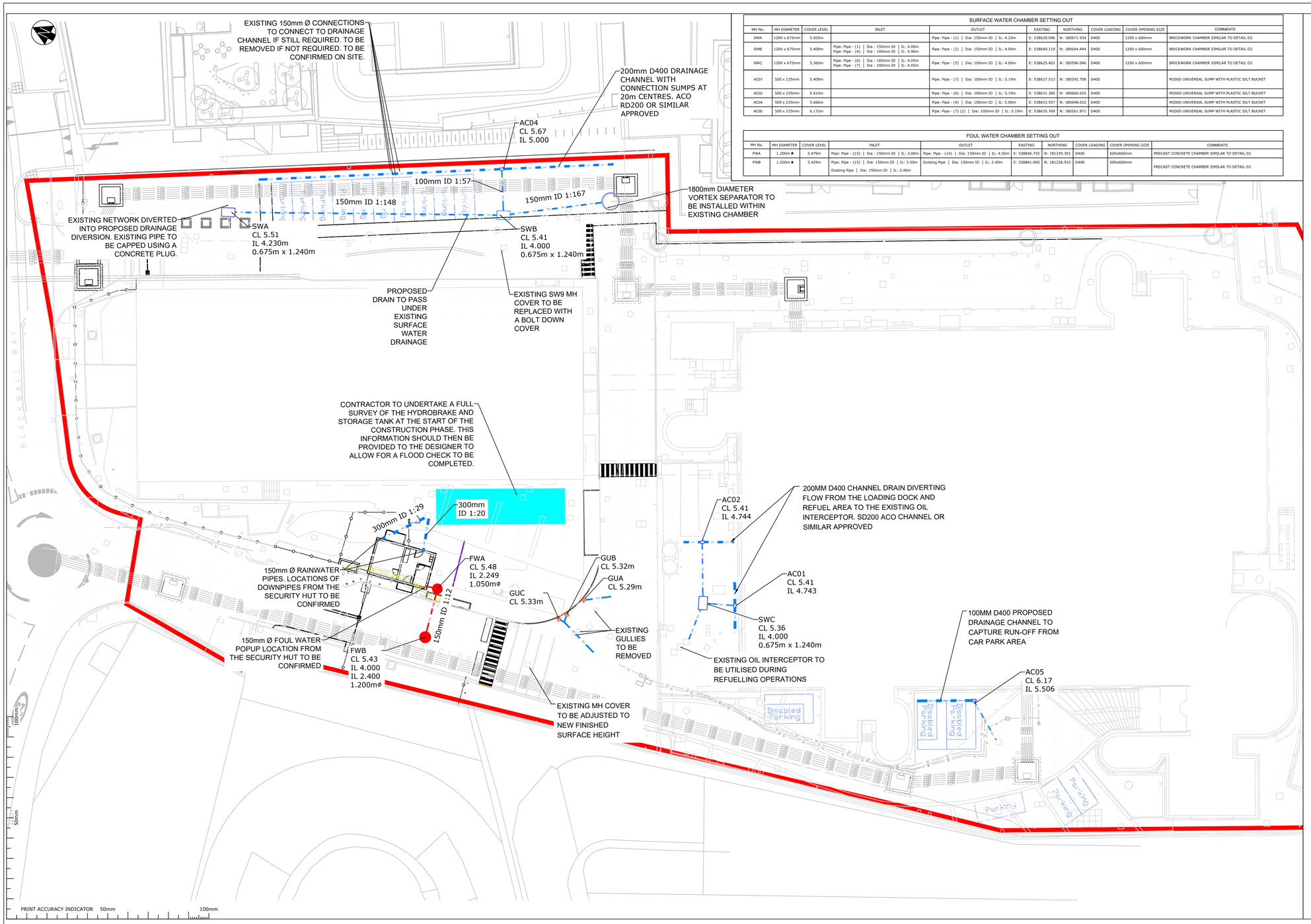
| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|
| S1.000 | Ssw157 | -0.363 | 0.000 | 0.06 | | 27.8 | OK | |
| S1.001 | Ssw150 | -0.135 | 0.000 | 0.23 | | 51.6 | OK | |
| S1.002 | Ssw14 | -0.067 | 0.000 | 0.18 | | 80.9 | OK | |
| S2.000 | Ssw115 | 1.356 | 0.000 | 1.64 | | 47.1 | FLOOD RISK | |
| S2.001 | Ssw116 | 1.289 | 0.000 | 2.09 | | 89.6 | FLOOD RISK | |
| S2.002 | Ssw113 | 0.512 | 0.000 | 4.66 | | 100.5 | SURCHARGED | |
| S2.003 | Ssw112 | -0.269 | 0.000 | 0.33 | | 140.6 | OK | |
| S1.003 | Ssw13 | 0.128 | 0.000 | 1.32 | | 193.8 | SURCHARGED | |
| S3.000 | Ssw96 | -0.065 | 0.000 | 0.44 | | 27.7 | OK | |
| S4.000 | Ssw87 | -0.009 | 0.000 | 0.44 | | 24.8 | OK | |
| S3.001 | Ssw93 | 0.205 | 0.000 | 0.64 | | 73.0 | SURCHARGED | |
| S3.002 | Ssw95 | 0.604 | 0.000 | 1.59 | | 74.9 | SURCHARGED | |
| S3.003 | Ssw86 | 0.337 | 0.000 | 1.47 | | 97.1 | SURCHARGED | |
| S1.004 | S5 | 0.120 | 0.000 | 1.26 | | 290.9 | SURCHARGED | |
| S1.005 | Ssw12 | 0.094 | 0.000 | 0.76 | | 306.1 | SURCHARGED | |
| S5.000 | Ssw68 | -0.088 | 0.000 | 0.49 | | 21.6 | OK | |
| S5.001 | Ssw64 | 0.032 | 0.000 | 1.20 | | 29.0 | SURCHARGED | |
| S5.002 | Ssw78 | 0.019 | 0.000 | 0.76 | | 34.2 | SURCHARGED | |
| S1.006 | Ssw53 | 0.184 | 0.000 | 1.54 | | 340.2 | SURCHARGED | |
| S6.000 | Ssw9 | 0.580 | 0.000 | 0.85 | | 14.9 | FLOOD RISK* | |

## Summary of Critical Results by Maximum Level (Rank 1) for Storm 1

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|---|---|---|---|---|---|---|---|---|---|
| S6.001 | Ssw8 | 15 Winter | 100 | +40% | 30/15 Summer | | | | 5.237 |
| S6.002 | Ssw7 | 30 Winter | 100 | +40% | 100/15 Summer | | | | 4.369 |
| S6.003 | S23 | 60 Summer | 100 | +40% | | | | | 2.949 |
| S1.007 | S20 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.456 |
| S1.008 | S21 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.316 |
| S1.009 | S22 | 15 Winter | 100 | +40% | | | | | 2.986 |
| S1.010 | S23 | 15 Winter | 100 | +40% | | | | | 2.713 |
| S7.000 | Ssw124 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 5.777 |
| S7.001 | Ssw161 | 15 Winter | 100 | +40% | 30/15 Summer | | | | 5.055 |
| S7.002 | Ssw162 | 15 Winter | 100 | +40% | 30/15 Summer | | | | 4.257 |
| S7.003 | Ssw164 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 4.154 |
| S7.004 | Ssw138 | 15 Winter | 100 | +40% | | | | | 4.009 |
| S7.005 | Ssw73 | 15 Winter | 100 | +40% | 100/15 Summer | | | | 3.858 |
| S1.011 | S24 | 15 Winter | 100 | +40% | | | | | 2.477 |
| S1.012 | S25 | 15 Winter | 100 | +40% | | | | | 2.285 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|
| S6.001 | Ssw8 | 0.767 | 0.000 | 1.79 | | 35.6 | SURCHARGED | |
| S6.002 | Ssw7 | 0.109 | 0.000 | 0.86 | | 30.6 | SURCHARGED* | |
| S6.003 | S23 | 0.000 | 0.000 | 1.97 | | 28.5 | SURCHARGED* | |
| S1.007 | S20 | 0.146 | 0.000 | 1.12 | | 371.4 | SURCHARGED | |
| S1.008 | S21 | 0.055 | 0.000 | 1.09 | | 371.1 | SURCHARGED | |
| S1.009 | S22 | -0.225 | 0.000 | 0.71 | | 368.9 | OK | |
| S1.010 | S23 | -0.149 | 0.000 | 0.92 | | 369.1 | OK | |
| S7.000 | Ssw124 | 0.427 | 0.000 | 0.89 | | 29.3 | FLOOD RISK | |
| S7.001 | Ssw161 | 0.775 | 0.000 | 1.91 | | 56.2 | FLOOD RISK | |
| S7.002 | Ssw162 | 0.197 | 0.000 | 3.57 | | 68.3 | SURCHARGED | |
| S7.003 | Ssw164 | 0.099 | 0.000 | 1.69 | | 141.3 | SURCHARGED | |
| S7.004 | Ssw138 | -0.016 | 0.000 | 0.87 | | 148.1 | OK | |
| S7.005 | Ssw73 | 0.023 | 0.000 | 1.15 | | 153.3 | SURCHARGED | |
| S1.011 | S24 | -0.374 | 0.000 | 0.51 | | 486.1 | OK | |
| S1.012 | S25 | -0.340 | 0.000 | 0.70 | | 481.2 | OK | |

# Appendix E – Drainage Layouts




SURFACE WATER CHAMBER SETTING OUT

| MH No. | MH DIAMETER | COVER LEVEL | INLET | OUTLET | EASTING | NORTHING | COVER LOADING | COVER OPENING SIZE | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| SWA | 1200 x 675mm | 5.505m | | Pipe: Pipe - (1) \| Dia: 150mm ID \| IL: 4.23m | E: 538629.096 | N: 180671.934 | D400 | 1200 x 600mm | BRICKWORK CHAMBER SIMILAR TO DETAIL D2 |
| SWB | 1200 x 675mm | 5.409m | Pipe: Pipe - (1) \| Dia : 150mm ID \| IL: 4.00m<br>Pipe: Pipe - (4) \| Dia : 100mm ID \| IL: 4.90m | Pipe: Pipe - (2) \| Dia: 150mm ID \| IL: 4.00m | E: 538649.119 | N: 180644.444 | D400 | 1200 x 600mm | BRICKWORK CHAMBER SIMILAR TO DETAIL D2 |
| SWC | 1200 x 675mm | 5.360m | Pipe: Pipe - (6) \| Dia : 100mm ID \| IL: 4.05m<br>Pipe: Pipe - (7) \| Dia : 100mm ID \| IL: 4.05m | Pipe: Pipe - (5) \| Dia: 100mm ID \| IL: 4.00m | E: 538625.402 | N: 180596.046 | D400 | 1200 x 600mm | BRICKWORK CHAMBER SIMILAR TO DETAIL D2 |
| AC01 | 500 x 235mm | 5.409m | | Pipe: Pipe - (7) \| Dia: 100mm ID \| IL: 5.19m | E: 538627.513 | N: 180592.708 | D400 | | M200D UNIVERSAL SUMP WITH PLASTIC SILT BUCKET |
| AC02 | 500 x 235mm | 5.410m | | Pipe: Pipe - (6) \| Dia: 100mm ID \| IL: 5.19m | E: 538631.385 | N: 180600.625 | D400 | | M200D UNIVERSAL SUMP WITH PLASTIC SILT BUCKET |
| AC04 | 500 x 235mm | 5.666m | | Pipe: Pipe - (4) \| Dia: 100mm ID \| IL: 5.00m | E: 538653.557 | N: 180648.022 | D400 | | M200D UNIVERSAL SUMP WITH PLASTIC SILT BUCKET |
| AC05 | 500 x 235mm | 6.172m | | Pipe: Pipe - (7) (2) \| Dia: 100mm ID \| IL: 5.19m | E: 538635.769 | N: 180561.971 | D400 | | M200D UNIVERSAL SUMP WITH PLASTIC SILT BUCKET |

FOUL WATER CHAMBER SETTING OUT

| MH No. | MH DIAMETER | COVER LEVEL | INLET | OUTLET | EASTING | NORTHING | COVER LOADING | COVER OPENING SIZE | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| FWA | 1.200m ♦ | 5.479m | Pipe: Pipe - (15) \| Dia : 150mm ID \| IL: 3.00m | Pipe: Pipe - (14) \| Dia: 150mm ID \| IL: 4.50m | E: 538846.755 | N: 181239.301 | D400 | 600x600mm | PRECAST CONCRETE CHAMBER SIMILAR TO DETAIL D1 |
| FWB | 1.200m ♦ | 5.429m | Pipe: Pipe - (15) \| Dia: 150mm ID \| IL: 3.50m<br>Existing Pipe \| Dia: 150mm ID \| IL: 2.40m | Existing Pipe \| Dia: 150mm ID \| IL: 2.40m | E: 538841.060 | N: 181236.933 | D400 | 600x600mm | PRECAST CONCRETE CHAMBER SIMILAR TO DETAIL D1 |

# NOTES:

1. DO NOT SCALE FROM THIS DRAWING MANUALLY OR ELECTRONICALLY.
2. ALL LEVELS ARE IN METRES ABOVE DATUM UNLESS STATED OTHERWISE
3. SERVICES INFORMATION SHOWN HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS INFORMATION AND OTHER SOURCES (EG. TRIAL HOLES, GPR, STATUTORY PLANS). COPIES OF THE ORIGINAL DRAWINGS ARE-- AVAILABLE FOR INSPECTION ALTHOUGH ONLY VALID FOR 3 MONTHS FROM RECEIPT OF THE STATUTORY PLANS. ADDITIONAL OVERHEAD CABLE INFORMATION IS ALSO BASED ON OBSERVATIONS ON SITE. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN AND THE CONTRACTOR SHOULD MAKE ADEQUATE PROVISION WITHIN THEIR TENDER TO CONFIRM THE LOCATION OF SERVICES ON SITE, INCLUDING ALL PRIVATE SERVICE CONNECTIONS TO PROPERTIES, AND PLAN HIS WORK ACCORDINGLY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECT'S, M+E, ENGINEERS AND SPECIALIST'S DRAWINGS AND SPECIFICATIONS. ANY DISCREPANCY BETWEEN DRAWINGS SHALL BE REFERRED TO THE ARCHITECT FOR CLARIFICATION.
5. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT BS STANDARDS, CODES OF PRACTICE AND BUILDING PRACTICE.
6. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL LEVELS AND DIMENSIONS PRIOR TO STARTING THE WORKS ON SITE. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
7. ALL SANITARY PIPEWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH EN:12056-2 2000.
8. ALL EXTERNAL BUILDING DRAINAGE SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH EN 12056-1:2000,EN:752-3:1997 (AMENDMENT 2),EN:752-4:1988 AND EN:1610:1998.
9. THE CONTRACTOR SHALL UNDERTAKE TESTING OF THE COMPLETED WASTEWATER SYSTEM SHALL BE CARRIED OUT IN ACCORDANCE WITH EN:12056-2:2000 (SANITARY PIPEWORK) AND EN:1610-1995. FOR DRAINAGE UNDER AND AROUND THE BUILDING
10. THE CONTRACTOR SHALL UNDERTAKE TESTING OF ALL GUTTER AND RAINWATER PIPES SHALL BE CONSTRUCTED IN ACCORDANCE WITH EN:12056-3:2000.
11. THE CONTRACTOR SHALL UNDERTAKE TESTING OF THE SURFACE WATER SYSTEM SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE GUIDANCE IN EN:1610:1998.
12. ALL FLOOR GULLIES AND DRAINS ARE TO BE RODABLE ALL SINKS, SHOWERS, ETC ARE TO BE FITTED WITH ANTI VACUUM TRAPS. ALL TRAPS TO SANITARY APPLIANCES MUST BE REMOVABLE.
13. ALL BRANCH CONNECTIONS AT GROUND LEVEL TO BE 150MM DIA, UNLESS NOTED OTHERWISE, WITH GRADIENT NOT FLATTER THAN 1 IN 80.
14. THE CONTRACTOR SHALL MAKE ANY ALLOWANCES FOR DEALING WITH LIVE FLOWS IN EXISTING DRAINS OR SEWERS.
15. ALL EXISTING CHAMBERS, GULLY CHANNELS, PIPES AND OTHER DRAINAGE APPARATUS SHALL BE PROTECTED FROM DAMAGE DURING THE WORKS.
16. 
17. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT NO MATERIAL ENTERS THE DRAINS (OTHER THAN WHICH THEY ARE DESIGNED TO CARRY).
18. ALL EXISTING CHAMBERS, GULLIES, ETC. AND THEIR COVERS, GRATINGS AND FRAMES TO BE IMPROVED, REPAIRED OR REPLACED AS NECESSARY TO SUIT THEIR LOCATION WITHIN THE FINISHED DEVELOPMENT.
19. ROAD GULLY CONNECTIONS TO BE 150MM DIAMETER VITRIFIED CLAY MATERIAL AT NO FLATTER THAN 1 IN 150 GRADE.
20. ALL CHAMBERS SHALL HAVE A MINIMUM OF 150MM CONCRETE SURROUND TO PREVENT FLOTATION DUE TO THE PRESENCE OF GROUND WATER UNLESS STATED OTHERWISE

## KEY:

- SITE BOUNDARY
- EXISTING FOUL WATER DRAINAGE
- EXISTING SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED DRAINAGE CHANNEL
- PROPOSED FOUL WATER DRAINAGE

## EXISTING SERVICE KEY:

- ELECTRICITY
- BRITISH TELECOM
- GTT
- COLT
- LUMEN
- VERIZON
- VODAFONE
- ZAYO
- CCTV
- EMPTY DUCTS
- SCAR
- WATER
- GAS
- UNKNOWN
- CHAMBER



| Rev | Date | Amendment Details | Dr'n | Chk' | App' |
|---|---|---|---|---|---|
| P04 | 22.02.2022 | ISSUED FOR INFORMATION | MJS | JF | JL |
| P03 | 04.11.2021 | PRE-APP ISSUE | GD | JF | JL |
| P02 | 16.09.2021 | RIBA STAGE 2 ISSUE | AC | JF | JL |
| P01 | 16.09.2021 | RIBA STAGE 2 ISSUE | AC | JF | JL |

DRAWING STATUS: FOR INFORMATION

TELEHOUSE

**TELEHOUSE EUROPE**

Docklands Site, Coriander Avenue, E14 2AA, London
T: +44 (0) 207 512 0550 W: www.telehouse.net

DESIGNER/CONTRACTOR:
Sweco
3rd Floor, Eldon House
2 Eldon Street
London
EC2M 7LS
Tel: +44 (0)20 3002 1210
Web: www.sweco.co.uk

SWECO

PROJECT:
TELEHOUSE SOUTH MAIN WORKS
DESIGNER/CONTRACTOR PROJECT NO:
65202635

TITLE:
SITE DRAINAGE LAYOUT

| DRAWN BY: | Date | CHECKED BY: | Date | Sheet Size | Scale(s) |
|---|---|---|---|---|---|
| AC | 16/09/2021 | JF | 16/09/2021 | A1 @ | 1:250 |

DRAWING No: TSX002-SWE-XX-XX-XX-DR-C-100007

REV: P04

## Appendix F – Thames Water Correspondence

[redacted]

Wastewater pre-planning

Our ref DS6091778

26 January 2022

## Pre-planning enquiry: Confirmation of sufficient capacity

**Site: Telehouse South, 1 Blackwall Way, Paul Julius Cl, London, Greater London, E14 2EH**

Dear [redacted]

Thank you for providing information on your development.

*Proposed Security Gate house consisting of 1No. W/C with hand basin and a sink for making coffees. 35m2 gate house area.*

*Proposed FW discharge via existing on-site private network discharging to Thames Water FWMH TQ38805610 along Blackwall Way.*

*Proposed SW discharge via the existing on-site private network discharging directly to the Thames.*

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

### Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

**You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.**

### Surface Water

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

When developing a site, policy SI 13 of the London Plan states “Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:”

The disposal hierarchy being:

1. rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. rainwater infiltration to ground at or close to source
3. rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. rainwater discharge direct to a watercourse (unless not appropriate)
5. controlled rainwater discharge to a surface water sewer or drain
6. controlled rainwater discharge to a combined sewer

Where connection to the public sewerage network is still required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA’s best practice guide on SuDS or that stated within the sites planning approval.

Please see the attached ‘Planning your wastewater’ leaflet for additional information.

## What happens next?

Please make sure you submit your connection application, giving us at least 21 days’ notice of the date you wish to make your new connection/s.

If you have any further questions, please contact me on [redacted]

## Kind Regards,

[redacted]
Developer Services – Adoptions Engineer, Sewer Adoptions Team
Tel: 0800 009 3921
**Get advice on making your sewer connection correctly at connectright.org.uk**
Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk