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PROLOGIS PARK, WEST LONDON

NPPF Flood Risk Assessment

2015-03-11

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Prologis Park, West London

NPPF Flood Risk Assessment

2015-03-11

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Executive Summary

This Flood Risk Assessment (FRA) has been prepared as part of the supporting documentation for the hybrid planning application of a proposed development at Prologis Park, West London.

The FRA has been prepared by WSP on behalf of Prologis in accordance with the guidelines set out in the National Planning Policy Framework (NPPF) as far as is applicable at this stage of the proposed development.

The application site is located to the east of Yiewsley in the London Borough of Hillingdon, in western Greater London. The Ordnance Survey (OS) grid reference for the application site is (507282, 180165), and the nearest Post Code is UB11 1PA.

The proposed development comprises a hybrid application for the phased comprehensive redevelopment of the site to provide an overall maximum gross floorspace of 45,000sqm of Light Industrial uses (Use Class B1c and / or Use Class B2) and / or Storage and Distribution uses (Use Class B8) and ancillary offices, together with servicing, parking, access roads and open space. Full planning permission is sought for Phase 1 containing 18,900sqm of floorspace in two buildings up to 16.2m in height (to ridge), together with associated highways works, open space, hard and soft landscaping, car parking and associated infrastructure. Outline planning permission is sought for Phase 2 for up to 26,100sqm of floorspace with all matters except for access reserved for later determination.

The application site covers an area of 12.05 hectares (ha) and is classified as a brownfield site. The application site is currently used for car parking in the southeast part of the site with the remainder unused following cessation of work to progress a previously proposed development.

The application site is entirely located in Flood Zone 1.

The application site is located adjacent to the Grand Union Canal, which is approximately 3m below the elevation of the site. There are also three ornamental ponds located on the eastern boundary of the site.

The proposed development is classified as 'Less Vulnerable' in accordance with Table 2 of the NPPF Flood Risk and Coastal Change Planning Practice Guidance (PPG). Less Vulnerable development types are appropriate within Flood Zone 1.

The London Borough of Hillingdon has confirmed that it holds no records of flooding within the vicinity of the application site associated with either the highway or local sources (surface water, groundwater or ordinary watercourses).

The Environment Agency has confirmed that it holds no records of flooding within and in the vicinity of the application site.

The Hillingdon Surface Water Management Plan (SWMP) highlights that the area in which the application site is located could be susceptible to surface water flooding during extreme rainfall events if the local drainage network becomes blocked or overwhelmed.

Thames Water has confirmed that it holds no historic records of external flooding associated with the public sewer network on and in the vicinity of the application site.

The current risk of flooding to the application site and the risk of the proposed development exacerbating flood risk to neighbouring properties prior to the implementation of mitigation measures, from the various sources of flood risk are detailed in Table A.

Table A: Summary of Flood Risk to and from the application site / proposed development

Sources of Flood Risk	Current risk to the Application Site	Risk of the Proposed Development exacerbating flood risk
Coastal and tidal	Negligible	Negligible
Fluvial	Negligible	Negligible
Pluvial and overland flow	Moderate	Moderate
Groundwater	Negligible	Negligible
Sewer and drainage infrastructure	Negligible	Negligible
Artificial sources	Negligible	Moderate

To mitigate the risk of the proposed development exacerbating flood risks from pluvial / overland flow flood sources to neighbouring property, it is proposed to utilise a Sustainable Drainage Systems (SuDS) management train for surface water drainage in accordance with the SuDS Manual. This will also mitigate the current risk of pluvial / overland flow flood sources to the application site.

For the preliminary surface water drainage strategy, all required storage will be provided by a combination of storage in tanks beneath permeable paving in the car parking areas and tanks beneath the loading bay yards. These have been designed to attenuate flows for all rainfall events up to and including the 1 in 100 year event including allowance for climate change (+30% increase in peak rainfall intensity), based on greenfield discharge rates to the Grand Union Canal.

The proposed development will have a maximum discharge of 61.4l/s (5.1l/s/ha) for the 1 in 100 year rainfall event including an allowance for climate change. Restricting discharge to this rate will ensure that the proposed development does not increase the risk of fluvial flooding both on and offsite.

In light of the above mitigation measures the risk of the proposed development exacerbating flooding to neighbouring property from pluvial/overland flow and/or to artificial sources (Grand Union Canal) is considered to be low to negligible.

1 Introduction

1.1 Appointment and Brief

1.1.1 WSP was commissioned by Prologis in January 2015 to prepare a site specific Flood Risk Assessment (FRA) and Drainage Strategy (DS) for a proposed development at Prologis Park, West London.

1.2 Aim and Objectives

1.2.1 The aim of this NPPF compliant FRA is to identify flood risks to the application site and those that may arise as a result of the proposed development. Where risks are identified, mitigation measures are proposed to manage the risks over the lifetime of the development, accounting for the effects of climate change. This includes presentation of an outline surface water drainage strategy for the proposed development.

1.2.2 To achieve this aim the following objectives have been met:

- A desk study and data research including review of:
  - The National Planning Policy Framework (NPPF), March 2012;
  - The NPPF Flood Risk and Coastal Change Planning Practice Guidance (PPG);
  - Development and Flood Risk – Guidance for the Construction Industry (CIRIA C624), CIRIA, 2004;
  - The SuDS Manual (CIRIA C697), CIRIA, 2007;
  - London Borough of Hillingdon Local Plan: Part 1 - Strategic Policies, November 2012;
  - London Borough of Hillingdon District Council Strategic Flood Risk Assessment (SFRA), November 2008;
  - Hillingdon Surface Water Management Plan Evidence Base, January 2013; and
  - Thames Catchment Flood Management Plan (CFMP), December 2009.
- Consultation with regulatory bodies and third parties including:
  - The Environment Agency
  - London Borough of Hillingdon
  - Thames Water
  - Affinity Water
  - Canal and River Trust

(Copies of correspondence exchanged with these stakeholders are provided in Appendix C).

- An assessment of flooding to the application site and proposed development from all possible sources, including fluvial, pluvial, groundwater, sewers, and man-made infrastructure.
- An assessment of the impact of the proposed development on local flood risks.
- An assessment of the residual flood risk to the proposed development and neighbouring property from local flood sources.

- Estimation of surface water flows based on the current conditions at the application site and existing drainage systems.
- Estimation of post development surface water flows based on the development proposals.

2 Policy

2.1 National Planning Policy Framework (NPPF)

2.1.1 The NPPF states 'a site specific flood risk assessment is required for proposals of 1 hectare (ha) or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency), and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding'.

2.1.2 The Environment Agency Flood Map (refer to Environment Agency Correspondence in Appendix C) indicates that the application site is entirely situated within Flood Zone 1[1].

2.1.3 The application site has a gross area of 12.05 hectares (ha), with approximately 9.31ha set to be developed as part of this application.

2.1.4 Within Table 2 (Flood Risk Vulnerability Classification) of the NPPF Flood Risk and Costal Change Planning Practice Guidance[2], the proposed development (commercial units) is classified as 'Less Vulnerable'.

2.1.5 Table 3 (Flood Risk Vulnerability and Flood Zone Compatibility) of the NPPF Flood Risk and Coastal Change Planning Practice Guidance, states that 'Less Vulnerable' development is appropriate in Flood Zone 1.

2.2 Local Policy

London Borough of Hillingdon Local Plan: Part 1 - Strategic Policies, 2012

2.2.1 The London Borough of Hillingdon Local Plan: Part 1 - Strategic Policies sets out the key elements of the planning framework for the borough over the next 15 years. It comprises a spatial vision, strategic objectives, a spatial strategy and core policies. This part of the local plan was adopted by the London Borough of Hillingdon in November 2012.

2.2.2 The Local Plan: Part 1 sets out a number of strategic objectives that are relevant to this FRA:

- SO10: Improve and protect air and water quality, reduce adverse impacts from noise including the safeguarding of quite areas and reduce the impacts of contaminated land.
- SO11: Address the impacts of climate change, and minimise emissions of carbon and local air quality pollutants from new development and transport.

2.2.3 The following Strategic Polices have been considered as part of this FRA:

- Policy EM1: Climate Change Adaptation and Mitigation states:

  '*The Borough will ensure that climate change adaptation is addressed at every stage of the development process by:*

  Locating and designing development to minimise the probability and impacts of flooding.

[1] Flood Risk and Coastal Change Planning Practice Guidance to the National Planning Policy Framework (2014) Department for Communities and Local Government - http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/ - accessed April 2014

Requiring major development proposals to consider the whole water cycle impact which includes flood risk management, foul and surface water drainage and water consumption'.

- Policy EM6: Flood Risk Management states:

  '*The council will require all new development to be directed away from Flood Zones 2 and 3 in accordance with the principles of the National Planning Policy Framework (NPPF).*

  The subsequent Hillingdon Local Plan: Part 2 - Site Specific Allocations LDD will be subjected to the Sequential Test in accordance with the NPPF. Sites will only be allocated within Flood Zones 2 or 3 where there are overriding issues that outweigh flood risk. In these instances, policy criteria will be set requiring future applicants of these sites to demonstrate that flood risk can be suitably mitigated.

  The Council will require all development across the borough to use sustainable urban drainage systems (SUDS) unless demonstrated that it is not viable. The Council will encourage SUDS to be linked to water efficiency methods. The Council may require developer contributions to guarantee the long term maintenance and performance of SUDS is to an appropriate standard.'

London Borough of Hillingdon Strategic Flood Risk Assessment, 2008

2.2.4 The Strategic Flood Risk Assessment (SFRA) for Hillingdon was published in November 2008 and establishes flood risk within the borough at a strategic level.

2.2.5 The SFRA provides guidance on the requirements for site specific FRAs. For FRAs that support proposed development for sites greater than 1ha within Flood Zone 1 there are no additional requirements beyond those of the NPPF PPG.

Hillingdon Surface Water Management Plan Evidence Base, 2013

2.2.6 The Hillingdon Surface Water Management Plan (SWMP) Evidence Base was published in January 2013 and establishes the various local flood risk issues in Hillingdon, the effect that these issues have and the potential options for managing them. A series of actions are presented, along with the partners responsible for taking the measures forward.

2.2.7 The SWMP undertook direct rainfall modelling to simulate surface water flooding in Hillingdon. The Hillingdon Preliminary Flood Risk Assessment (PFRA) identifies this modelling as the locally agreed surface water information for Hillingdon.

The London Plan, Spatial Development Strategy for Greater London, July 2011

2.2.8 Policy 5.12 and Policy 5.13 within the London Plan relate to flood risk and sustainable drainage.

2.2.9 Policy 5.12 (flood risk) states that '*development proposals must comply with flood risk and management requirements within PPS25*' (superseded by NPPF) '*over the lifetime of the development and have regard to measures proposed in the Thames Estuary 2100 (TE2100) and the relevant Catchment Flood Management Plan*'.

2.2.10 As the proposed development is located within Flood Zone 1, it is considered to pass the Sequential Test and the Exception Test is not required. Therefore the proposed development automatically compiles with Policy 5.12 point C of the London Plan.

2.2.11 Policy 5.13 (sustainable drainage) states that '*development should utilise Sustainable Drainage Systems (SuDS) within the proposed development unless there are particular reasons for not doing so, and should aim to achieve Greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible*' in line with the SuDS hierarchy.

Thames Catchment Flood Management Plan, 2009

2.2.12 The River Thames Catchment Flood Management Plan (CFMP) was published in December 2009 by the Environment Agency. The CFMP sets out flood risk, the source of these risks and any associated concerns or issues in the Thames catchment from rivers, groundwater, surface water and tidal flooding. The CFMP establishes a number of flood risk management policies which will deliver sustainable flood risk management for the long term.

2.2.13 The site is located within the Towns and Villages in open floodplain (central) sub area of the Thames CFMP. The strategic policy for management of fluvial flood risk in this area is defined as follows:

'Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.'

3 Background

3.1 Site Location

3.1.1 The application site is situated to the east of Yiewsley in the London Borough of Hillingdon (LBH), in western Greater London.

3.1.2 The site is bordered to the west by light industrial properties on Horton Close, to the north by Horton Road, to the east by Ironbridge Road and to the south by the Grand Union Canal, which is set approximately 3m below the site. Refer to Location Plans (Figures 3.1 and 3.2) within Appendix B.

3.1.3 The Ordnance Survey (OS) grid reference for the application site is (507282, 180165), and the nearest Post Code is UB11 1PA.

3.2 Site Description

3.2.1 The application site has a gross area of approximately 12.05ha and is considered to be a brownfield development site, with significant areas of open green space.

3.2.2 Table 3-1 describes the general application site characteristics.

Table 3-1: General application site characteristics

Area	Gross Parcel Area = 12.05ha	
General Topography	The application site is generally highest along the northern boundary, from which the site falls towards the Grand Union Canal. Levels along the northern boundary are approximately 36m Above Ordnance Datum (AOD) and levels along the southern boundary are around 30m AOD. The application site is therefore considered to be a single drainage catchment which discharges to the Grand Union Canal.	
Existing Surfacing	Brownfield with significant areas of open green space.	
Current Use	Currently partially used for car parking in the southeast part of the site with the remainder unused following cessation of work to progress a previously proposed development.	
Boundaries	**North**	Horton Road
	South	Grand Union Canal
	East	Ironbridge Road
	West	Light industrial properties on Horton Close
Access	Access to the application site is provided via Horton Road to the north	

3.3 Topography and Site Features

3.3.1 In December 2014 Greenhatch Group completed a topographical survey for the application site. The topographical survey indicates that levels on site range from 36.1 to 29.9m AOD. Levels on the survey undertaken by Greenhatch Group have not been independently verified by WSP.

3.3.2 The topographical survey indicates that the highest points at the application site are along the north

eastern boundary. The north eastern corner and central part of the site have been landscaped to a consistent level of around 36m AOD. Adjacent to this are three discrete areas that have been landscaped to approximately 33m AOD, and are connected to the upper level by two ramps for the onsite road network. The western boundary of the site is formed of a landscaped earth embankment that is elevated above the adjacent areas of the site with a crest level of between 35m and 38m AOD. The southern boundary of the site has also been landscaped and comprises a grassed area with some trees that is slightly elevated above the level of the adjacent onsite road and then falls towards the boundary fence adjacent to the towpath of the Grand Union Canal at approximately 30m AOD.

3.3.3 The application site comprises a single drainage catchment, which discharges to the Grand Union Canal.

3.3.4 Please refer to Appendix D for the Greenhatch Group topographical survey (Drawing No. 21053-OGL Rev 0).

3.4 Geology and Hydrogeology

3.4.1 British Geological Survey (BGS) maps (available online at www.bgs.ac.uk and accessed in February 2015) indicate that the site is situated on bedrock of London Clay Formation – Clay Silt and Sand. This bedrock is overlain by superficial deposits of the Lynch Hill Gravel Member – Sand and Gravel.

3.4.2 Environment Agency online resources (available at www.environment-agency.gov.uk and accessed in August 2014) indicate that the application site is not within a groundwater Source Protection Zone (SPZ). The Terrace Gravels are classed as a principal aquifer by the Environment Agency, however due to historical quarrying the gravels are intermittent across the site.

3.4.3 The bedrock geology within the site boundary does not have an aquifer designation.

3.4.4 The Stockley Park Geo-environmental Assessment (WSP September 2014) gives a summary of the site geology based on findings of a ground investigation undertaken in 2014. A summary of the site geology is given in Table 3-2.

Table 3-2: Summary of Site Geology

Stratum Name	Depth to top of stratum (m bgl)	Elevation of top of stratum (mAOD)	Thickness (m)	Typical Description
Made Ground	0.0	36.80 to 32.47	(0.5) to 12.45	Generally described as sandy gravelly CLAY. Gravels including but not limited to flint, brick, concrete, chalk and clinker. Inclusions of plastic, wood, geotextile, tile, glass and metal.
River Terrace Deposits (extreme east and west of the site only)	1.1 to 7.2	33.54 to 25.98	0.2 to (4.7)	Predominantly sandy GRAVEL and GRAVEL. Gravels were flint.
London Clay	2.9 to 12.45	29.84 to 23.43	(0.3) to (10.2)	CLAY with minor inclusions of sand and silt.

3.4.5 In addition the Geo-environmental Assessment notes that an underground clay barrier has previously been constructed at the north and west of the site to act as a barrier preventing ingress of ground gas and groundwater from the golf course to the north. In addition, there is a section of clay barrier along the south of the site.

3.4.6 The clay barrier along the southern and western boundaries of the site is located within the landscaped areas that are outside the developable area of the proposed development. However the barrier along the northern boundary is within the developable area.

3.4.7 An additional investigation in November 2014 was undertaken to investigate the extent of the northern clay barrier (refer to Appendix E). This found that the upper surface of the barrier slopes downwards from the northern boundary of the site at a slope of between 1:2.5 and 1:4.2.

3.4.8 As part of the 2014 ground investigation groundwater monitoring was undertaken across the site at borehole and window sampling locations. This showed that groundwater levels range between 33.49m AOD and 30.18m AOD, and these fall from the north east of the site towards the southwest. These are currently between 0.76m below ground level (bgl) and 3.32m bgl.

3.4.9 The hydrogeological regime has been heavily modified by the northern, north western and southern clay barriers. Based on the groundwater level data, it is considered that groundwater is experiencing recharge from the landscaping area in the north eastern section of the site through irrigation and rainfall. Groundwater flow is retarded by the current sheet piled raised platform in the central section of the site prior to flowing towards the south west. There is no evidence to suggest that groundwater beneath the site is in hydraulic connectivity with the Grand Union Canal.

3.5 Identification of Existing Watercourses

3.5.1 The Grand Union Canal flows along the southern boundary of the application site from west to east. The towpath is located approximately 3m below the general ground level in the southern part of the site. The Arup PRA (2009) indicated that canal water levels adjacent to the site are typically between 29.4 and 29.6m AOD.

3.5.2 There is a small drainage ditch that runs along the northern boundary of the site adjacent to Horton Road that outfalls into the most northern of the ornamental lakes described in Section 3.6.

3.5.3 There are no other watercourses in the vicinity of the site.

3.6 Identification of Other Water Features

3.6.1 Three ornamental lakes are located along the eastern edge of the site. It is understood from the Stockley Park Phase 3 Flood Risk Assessment (Ove Arup & ARUP 2009) that these lakes are fed primarily from a borehole in the south eastern corner of the site. Water is pumped from the borehole to the lake in the south eastern corner of the site before being pumped to the lake in the north eastern corner. Water then flows via gravity from north to south through the three lakes. Water levels are monitored to control the amount of water abstracted from the borehole to supply the lakes.

3.6.2 The Stockley Park Phase 3 Flood Risk Assessment also states that the ornamental lakes currently receive surface water drainage from the Site. This is collected from the exiting surface water drainage system at the previously proposed location for an outfall to the Grand Union Canal and pumped up to the lakes.

3.6.3 The lake in the south eastern corner has an outfall pipe that allows overflow of water via a pipe network beneath the GlaxoSmithKline site east of Ironbridge Road into the Grand Union Canal adjacent to the Stockley Road bridge.

3.6.4 There are also several lakes located immediately north of the development and Horton Road which are associated with the Stockley Park Golf Course. These are located at a lower elevation than the application site.

3.7 Existing Flood Defences

3.7.1 The Environment Agency's Flood Map for Planning does not show any flood defences in the vicinity of the site.

3.8 Existing Sewer and Drainage Infrastructure

3.8.1 The application site is classified as a brownfield site and currently drains via a piped drainage system and the ornamental lakes to the Grand Union Canal.

3.8.2 An existing surface water drainage system associated with a previous planning permission for the site was partially installed across the site in 2002. This comprises a pipe drainage system that has been designed to collect surface water runoff and discharge it to the Grand Union Canal (refer to as built drawings in Appendix G).

3.8.3 The proposed outfall for the surface water drainage system to Grand Union Canal on the southern boundary of the site has not been completely constructed as planned. The details of the previously proposed outfall arrangement are provided in Appendix G on Drawing No. 2501 Rev 8. Following inspection of the site on 4 February 2015 it has been concluded that the pipe network has been constructed up to the petrol interceptor indicated on the drawing, however the proposed 750mm pipe and penstock arrangement to connect to a new outfall into the canal has not been constructed. This is supported by the Storm Water As-built drawing (Drawing No: D23/MQ/002, March 2002), which is also provided in Appendix G.

3.8.4 Thames Water records obtained in February 2015 indicate the presence of a private foul rising main on the western boundary of the site that connects to a 225mm diameter Thames Water foul sewer in the northwest corner of the site that leaves the site towards Horton Road.

3.8.5 Thames Water records also identify the following infrastructure located in the vicinity of the application site:

Foul Water

- A 225mm diameter sewer runs leaves the site at the north west corner and continues westwards along Horton Road. Another 225mm diameter sewer runs northwards along Horton Close adjacent to the western boundary of the site and connects to the sewer on Horton Road.
- There are numerous foul sewers serving the properties south of the Railway Line and Grand Union Canal, south of the application site.

Surface Water

- A 225mm diameter sewer runs beneath Horton Road in a westwards direction to the north west of the site.
- A 375mm diameter sewer runs beneath Horton Close to the west of the site in a southerly direction.
- There are numerous surface water sewers serving the properties south of the Railway Line and Grand Union Canal, south of the application site.

3.9 Historic Flood Records

3.9.1 Table 3-3 summarises the historic flood records obtained through consultation and liaison with the

various bodies contacted in the production of this FRA.

Table 3-3: Historic Flood Records

Information Source	Flood Records/Details
Environment Agency	The Environment Agency has confirmed that they hold no record of historic flooding within the vicinity of the application site.
London Borough of Hillingdon	The London Borough of Hillingdon has confirmed that they hold no record of historic flooding within the vicinity of the application site associated with either the highway or local sources (surface water, groundwater or ordinary watercourses). The Hillingdon Surface Water Management Plan (SWMP) does not contain any records of surface water flooding incidents in the vicinity of application site. The SWMP contains records of sewer flooding and, notes that there are six records of sewer flooding in the postcode area UB7 8 where the application site is located; however no details are provided as for their exact location (Refer to Figure 9.2 in Appendix F).
Thames Water	Thames Water has confirmed that they hold no historic records of external flooding associated with the public sewer network within the vicinity of the application site.

4 Proposed Development

4.1 Description

4.1.1 The proposed development comprises a hybrid application for the phased comprehensive redevelopment of the site to provide an overall maximum gross floorspace of 45,000sqm of Light Industrial uses (Use Class B1c and / or Use Class B2) and / or Storage and Distribution uses (Use Class B8) and ancillary offices, together with servicing, parking, access roads and open space. Full planning permission is sought for Phase 1 containing 18,900sqm of floorspace in two buildings up to 16.2m in height (to ridge), together with associated highways works, open space, hard and soft landscaping, car parking and associated infrastructure. Outline planning permission is sought for Phase 2 for up to 26,100sqm of floorspace with all matters except for access reserved for later determination.

4.1.2 The proposed illustrative parameters plan has been produced by Michael Sparks Associates (Drawing No. 27122/PL/056A), refer to Appendix A.

4.1.3 The application site will be re-landscaped to a level of 34.2 m AOD for the majority of the developable area including all built development including buildings, car parking areas, loading bay yards and the access road. The exception will be the area around Unit 2 which comprises the southeast portion of the site. This will be re-landscaped to a level of 33.2 m AOD.

4.2 Climate Change Allowances

4.2.1 In September 2013 the Environment Agency released 'Climate Change Allowances for Planners[3]' guidance to support the NPPF. Within this guidance it states that the recommended contingency allowance for climate change is a 20% increase in peak rainfall intensity by 2115 for assessment of pluvial flood risk, based on a typical lifespan for a development of this type.

[3] Environment Agency, Climate Change Allowances for Planners – Guidance to Support the National Planning Policy Framework (2013)

5 Overview of Flood Risk

5.1 Introduction

5.1.1 The following section provides an overview of flood risk to the application site, and risk arising to and from the proposed development. An assessment has been undertaken for each possible source that could affect the proposed development in accordance with the NPPF Flood Risk and Coastal Change Planning Practice Guidance (PPG).

5.2 Existing Risk of Flooding to the Site

Flooding from Coastal and Tidal Sources

5.2.1 The application site is not located within the vicinity of the coast, nor is the application site situated within the vicinity of an estuary.

5.2.2 The risk of coastal and tidal flooding to the application site is negligible.

Flooding from Fluvial Sources

5.2.3 The application site is not located within the vicinity of any fluvial watercourses.

5.2.4 The Environment Agency's detailed flood mapping shows that the application site is located within Flood Zone 1, which comprises land assessed as having less than 1 in 1,000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability [AEP]) (refer to Appendix C).

5.2.5 The London Borough of Hillingdon (LBH) has confirmed they have no record of historic flooding within the vicinity of the application site. Refer to Table 3-3 within this report.

5.2.6 The risk of flooding from fluvial sources to the application site is considered to be negligible.

Flooding from Pluvial / Overland Flow Sources

5.2.7 In extreme storms the ground may become saturated and the existing drains and sewers which carry away surface water may not be able to accommodate these flows, or may even be blocked with debris, leading to surface water flooding.

5.2.8 The Environment Agency's Risk of Flooding from Surface Water mapping (available online at www.environment-agency.gov.uk, accessed in February 2014) indicates that the majority of the application site is at 'very low' risk of surface water flooding and there are no overland flow routes across the application site. Land assessed as having a 'very low' risk has an annual probability of surface water flooding less than to 1 in 1000 (<0.1% AEP).

5.2.9 The Risk of Flooding from Surface Water mapping also indicated that there are small isolated areas of the application site that are at higher risk from surface water flooding ranging from 'high', 'medium' and 'low'. Land assessed as having a 'high' risk has an annual probability of surface water flooding greater or equal to 1 in 30 (≥3.3% AEP). Land assessed as having a 'medium' risk has an annual probability of surface water flooding between 1 in 30 and 1 in 100 (3.3% to 1% AEP). Areas deemed to be at 'low' risk have an annual probability of surface water flooding of less than 1 in 100 (<1% AEP) but greater

than or equal to 1 in 1,000 (≥0.1% AEP).

5.2.10 Refer to Environment Agency correspondence in Appendix C which shows the Environment Agency' Risk of Flooding from Surface Water mapping for the application site.

5.2.11 London Borough of Hillingdon has confirmed that they hold no records of flooding within the vicinity of the application site associated with pluvial or overland flow sources.

5.2.12 The Hillingdon Surface Water Management Plan (SWMP) has undertaken hydraulic modelling of the risk of surface water flooding for the entire borough including the application site (SWMP Figure 5.2, Appendix F). The Hillingdon Preliminary Flood Risk Assessment (PFRA) identifies this modelling as the locally agreed surface water information for Hillingdon. Based on the results of this modelling the SWMP identified Critical Drainage Areas (CDAs) where there is a concentrated and higher risk of surface water flooding. The application site is not within any of the CDAs identified by the SWMP.

5.2.13 The SWMP mapping indicates that in the 1 in 100 chance of occurring rainfall event, there are some parts of the site that are at risk of flooding, however the majority of the site is not at risk. Where there is a risk of flooding flood depths are predicted to range between 0.1m and 0.5m. Please refer to Hillingdon SWMP flood risk mapping in Appendix F.

5.2.14 The risk of flooding from pluvial or overland flow sources to the application site is considered to be moderate. However this will be managed through the proposed surface water drainage strategy which is set out in Section 6.

Flooding from Groundwater Sources

5.2.15 Groundwater flooding occurs when the water table rises above the level of the ground. The ground investigations undertaken in 2014 recorded groundwater levels between 33.49m AOD and 30.18m AOD across the site. These fall from the north east of the application site towards the southwest. These were between 0.76m below ground level (bgl) and 3.32m bgl.

5.2.16 The proposed ground levels for the site are between 34.2m AOD and 33.2m AOD, which provides a minimum of 1m freeboard above the 2014 recorded groundwater levels.

5.2.17 The hydrogeological regime has been heavily modified by the northern, north western and southern clay barriers. Based on the groundwater level data, it is considered that groundwater is experiencing recharge from the landscaping area in the north eastern section of the site through irrigation which will cease following development of the application site.

5.2.18 Groundwater was not observed above the ground surface during the site visit undertaken on 4 February 2015.

5.2.19 The Stockley Park Geo-environmental Assessment (WSP September 2014) indicates that the site is underlain by London Clay Formation – Clay Silt and Sand (Bedrock). Superficial deposits are predominantly comprised of made ground with some areas of original terrace gravels (Lynch Hill Gravel Member – Sand and Gravel).

5.2.20 The Hillingdon SWMP indicated that the application site is in a location where there is an increased potential for elevated groundwater levels within permeable superficial deposits (SWMP Figure 10.2, Appendix F). This mapping was developed at a strategic scale and does not take into account the historic use of the site. However these permeable superficial deposits are no longer present on the application site.

5.2.21 The London Borough of Hillingdon has confirmed that they do not have records of groundwater flooding in the vicinity of the application site.

5.2.22 Therefore, it has been considered that the risk of groundwater flooding to the application site is negligible.

Flooding form Sewer and Drainage Infrastructure Sources

5.2.23 As detailed within Section 3.8, Thames Water sewer records indicate that there are two foul sewers located within the red line boundary of the application site. Thames Water sewer records also indicate the presence of a number of foul and surface water sewers within the vicinity of the application site, primarily serving Horton Road and Horton Close. Refer to Appendix C for Thames Water sewer records.

5.2.24 The topography of the surrounding land indicates that if the offsite foul and surface water networks on Horton Road and Horton Close were to become surcharged, flooding would flow away from the application site, towards the south and west.

5.2.25 The Hillingdon Surface Water Management Plan (SWMP) contains records of sewer flooding in Yiewsley as a result of hydraulic overload of the foul sewer network. The specific locations of these foul sewer flooding incidences are not identified in the SWMP (refer to Appendix F).

5.2.26 Thames Water has confirmed that they hold no records of external flooding associated with the public sewer network within the vicinity of the application site.

5.2.27 The risk from the network of sewers offsite coupled with the relatively limited information on historic foul flooding in the vicinity of the site mean that the risk of flooding from this source to the application site is considered to be negligible.

Flooding from Artificial Sources

Dam and Canal Infrastructure

5.2.28 The application site is located immediately to the north of the Grand Union Canal. The canal is located approximately 3m below the typical elevation of the southern part of the application site. Therefore it is very unlikely that the canal will pose any flood risk to the application site.

5.2.29 The Environment Agency's online map (available online at http://watermaps.environment-agency.gov.uk/ accessed in August 2014) indicates that the application site does not lie within the inundation area of any reservoirs.

5.2.30 The risk of flooding from these sources to the application site is considered to be negligible.

5.3 Risk of Flooding Arising from the Proposed Development

Flooding from Coastal and Tidal Sources

5.3.1 The risk of the proposed development exacerbating costal and tidal flooding to neighbouring property is negligible.

Flooding from Fluvial Sources

5.3.2 The risk of the proposed development exacerbating fluvial flooding to neighbouring property is negligible.

Flooding from Pluvial/Overland Flow Sources

5.3.3 There are a number of small areas at risk of surface water flooding on the application site (refer to SWMP Figure 5.2, Appendix F).

5.3.4 Risks from pluvial and overland flow flooding ranges from 'high' (3.33% AEP) to 'low' (<1% - ≥0.1% AEP).

5.3.5 By developing the application site, without appropriate mitigation measures, the risk of pluvial/overland flows from the proposed development will increase. The proposed development will increase the impermeable surface coverings present at the application site, increasing the risk of greater volumes and rates of surface water discharging to the Grand Union Canal. However, the proposed surface drainage strategy will incorporate sufficient attenuation storage to restrict run-off from the development to greenfield rates.

5.3.6 The risk of the proposed development exacerbating pluvial/overland flow flooding to neighbouring property is moderate. Further information on flood risk management measures to mitigate this risk is discussed within Sections 7 and 8 of this FRA.

Flooding from Groundwater Sources

5.3.7 Basements or underground car parks are not proposed as part of the proposed development. Foundations for the majority of the proposed development will be relatively shallow which are unlikely to encounter groundwater across the site.

5.3.8 The risk of the proposed development exacerbating groundwater flooding to neighbouring property is negligible.

Sewer and Drainage Infrastructure

5.3.9 The proposed development comprises large commercial storage units with small supporting offices and therefore the increase in loading upon the foul sewer network will be limited.

5.3.10 Surface water runoff from the proposed development is proposed to be discharged at greenfield rates to the Grand Union Canal.

5.3.11 The risk of the proposed development exacerbating flooding to neighbouring property from sewer and drainage infrastructure is negligible.

Flooding from Artificial Sources

Dam and Canal Infrastructure

5.3.12 The application site is located immediately north of the Grand Union Canal and at present runoff from the site discharges into the canal.

5.3.13 The proposed development will increase the impermeable surface coverings present at the application site, increasing the risk of greater volumes and rates of surface water discharging to the Grand Union Canal. However, the proposed surface drainage strategy will incorporate sufficient attenuation to restrict run-off from the development to greenfield rates.

5.3.14 A previous discharge license between British Waterways and the previous owner of the site allowed a discharge of 1000 l/s to the Grand Union Canal. However the proposed surface water drainage scheme has been designed to limit discharge to greenfield runoff rates in line with current planning policy and best practice.

5.3.15 The risk of the proposed development exacerbating flooding from the Grand Union Canal to neighbouring property is moderate. Further information on flood risk management measures to mitigate this risk is discussed within Sections 7 and 8 of this FRA.

Ornamental Lakes

5.3.16 The ornamental lakes that are located on the western boundary of the site will be located below the ground level of the proposed development following profiling of the ground level. The water levels are maintained by supply from a borehole which is controlled by automatic telemetry. The lake in the south eastern corner has an outfall pipe that allows overflow of water via a pipe network beneath the GlaxoSmithKline site east of Ironbridge Road, into the Grand Union Canal adjacent to the Stockley Road bridge. Therefore the risk to the application site from this source is considered to be negligible.

6 Indicative Surface Water Drainage Strategy

6.1 Existing Drainage Regime

6.1.1 The application site is a brownfield site, with a gross area of 12.05ha and a developable area of 9.31ha (refer to proposed layout on Drawing No. 27122-PL-56A in Appendix A).

6.1.2 The application site is understood to currently drain through a combination of infiltration and overland flow to the Grand Union Canal and an on-site surface water drainage system that discharges to the Grand Union Canal via the ornamental ponds.

6.1.3 The on-site surface water drainage system collects runoff from the existing road network and car parking area. However the extent to which the outfall to the canal has been constructed is uncertain. Therefore given the fact that the impermeable areas comprise only 15% of the total site area and it is not clear how these are ultimately drained, it has been conservatively assumed for the purpose of this drainage strategy that the site effectively drains as a greenfield site to ground via limited infiltration and overland flow to the Grand Union Canal.

6.1.4 The topographical survey indicates that levels at the application site range from 36.13 to 29.35m AOD AOD. The highest areas of the application site are located along the north eastern boundary, from which the site falls towards the Grand Union Canal on the southern boundary. The current site has been landscaped into two separate levels, with an earth embankment on the western boundary.

6.1.5 It is proposed that the application site will be re-landscaped such that it will fall towards the Grand Union Canal and therefore the developable area of the proposed development will comprise one drainage catchment.

6.1.6 As the proposed development area is less than 50ha, the Institute of Hydrology (IoH) Report 124 Flood Estimation for Small Catchments (1994) method has been used to estimate the greenfield peak flow rate from the Application Site, which is an approved methodology specified within the Environment Agency's Rainfall Runoff Management for Developments Report[4].

6.1.7 Table 6.1 below summarises the estimated current greenfield discharge rates per hectare of developable area and for the application site. Full calculations are provided in the drainage calculation pack in Appendix H.

Table 6.1: Summary of Greenfield Peak Discharge Rates

Developable Area (ha)	Return Period (yr)	Peak Greenfield Discharge Rate (l/s/ha)	Application Site Discharge Rate (l/s)
9.31	QBAR	1.6	19.3
	Q 1	1.4	16.9
	Q 30	3.6	43.4
	Q 100	5.1	61.4

[4] Great Briton, R Kellagher (2013) *Rainfall Runoff Management for Development Report SC030219,* Environment Agency, Bristol

6.2 Drainage Strategy Requirements

6.2.1 The proposed drainage strategy seeks to replicate the site's existing hydrology whilst avoiding increases in the volume and rate of surface water discharges from the site as a result of the proposed development.

6.2.2 The NPPF requires that flood risk to land and property is not increased as a result of development upstream.

6.2.3 Changes in the volume and rate of surface water runoff from the development, as a result of increases in impermeable land uses, could increase the risk of flooding downstream unless sufficient steps are taken within the proposed development to mitigate it.

6.2.4 A fundamental principle of sustainable development in terms of flood defence is the reduction of surface water runoff from new developments. It is best practice that the surface water drainage arrangements for any development site should be that volumes and peak discharge rates leaving the site are no greater than the rates pre-development. Where possible, these rates should be restricted to those associated with the greenfield conditions of the site. Any increase in surface water runoff above the pre-development (or greenfield) volumes must be attenuated on site.

6.3 Planning Policy Changes

6.3.1 Changes to relevant planning policy and the way drainage is assessed as part of the planning application process are scheduled to be implemented in April 2015. These will give greater weight to the use of SuDS in new development alongside other material considerations during the determination of a planning application.

6.3.2 The final standards and guidance associated with the new planning arrangements are yet to be published, but it is likely that when detailed and implemented, the local planning authority will have an effect on the design and locations of the SuDS at the proposed development.

6.3.3 To anticipate changes as a result of the resulting revised planning policy, on-going consultation prior to and post the submission of this hybrid planning application is recommended to ensure that a compliant drainage strategy is established.

6.4 Preliminary Surface Water Drainage Strategy

6.4.1 Part H of the Building Regulations: Drainage and Waste Disposal establishes a hierarchy for surface water disposal, which encourages a SuDS approach. This hierarchy stipulates that surface water runoff not collected for reuse must be discharged to one or more of the following in order of priority:

1. Discharge into the ground (infiltration); or, where not reasonably practicable,
2. Discharge to a surface water body; or, where not reasonably practicable,
3. Discharge to a surface water sewer, highway drain, or another drainage system; or, where not reasonably practicable,
4. Discharge to a combined sewer.

6.4.2 The site is underlain by made ground superficial deposits and London Clay Formation bedrock. Owing to the poor infiltration potential and the clay barriers preventing groundwater leaving the site, non-infiltrating SuDS techniques are proposed in order to manage surface water at the site.

6.4.3 Following the hierarchy set out above, as surface water cannot be discharged to ground, it will be

discharged at restricted rates to the Grand Union Canal (surface water body), which flows west to east to the south of the application site.

6.4.4 A license for discharge of clean surface water to the Grand Union Canal has previously been agreed with British Waterways by the previous owner of the site. Prologis are currently negotiating transfer of this license to themselves with the Canal and Rivers Trust the current operator for the Grand Union Canal who have replaced British Waterways. For the purpose of this drainage strategy it has been assumed that the outfall location to the canal agreed for the original license will be retained.

6.4.5 Currently, the CIRIA document C697 forms the best practice document for the design of SuDS for development sites.

6.4.6 The concept of sustainable drainage is that environmental and social factors such as the quantity and quality of runoff and amenity value of surface water in the urban or developed environment are considered when making decisions about drainage. SuDS can be used to compliment or replace conventional piped urban drainage to replicate the natural water cycle. This process can be used in certain locations to reduce or even eliminate the existing problems associated with such systems: risk of flooding, potential of pollution or poor water quality and damage to the natural environment.

6.4.7 A wide range of drainage systems and techniques can be categorised as SuDS. From site wide installations (wetlands, ponds) to domestic source control (green roofs), the scale of SuDS schemes and their benefits can vary widely

6.4.8 The development site has a gross area of 12.05ha. However, it is proposed that only an area of 9.31ha will be developed with the existing green landscaped areas along the western and southern boundaries being retained.

6.4.9 The proposed development will result in a net increase of impermeable area onsite. Based on the proposed development parameters plan (Drawing No. 27122/PL/056A, Appendix A) the percentage of impermeability is estimated to be approximately 83% of the developable area. Therefore, it has been assumed for this drainage strategy that the proposed development will have a total impermeable area of 7.75ha (83% of the 9.31ha development area).

6.4.10 Table 6-2 summarises the unmitigated peak post development discharge rates for a variety of storm events, calculated using the Rational Method.

Table 6-2: Rational Method, Unmitigated Post Development Discharge Rates

Proposed Development Area (ha)	PIMP (%)	Impermeable Area (ha)	Return Period (yr)	Rainfall Intensity (mm/hr)	Unmitigated Peak Post Development Discharge Rates (l/s)
9.31	83	7.74	1	50.80	1,094
			30	113.02	2,433
			100	143.90	3,098
			100 + CC (20%)[5]	187.07	3,718

[5] To allow for the effects of climate change over the lifetime of the Proposed Development, an increase of 20% has been applied to the peak rainfall intensity for the 1 in 100 year storm.

6.4.11 Local policy and guidance produced by the Environment Agency state that the surface water drainage arrangements for any Proposed Development should be that volumes and peak discharge rates leaving the site are no greater than the rates for the site prior to development and, where possible, are returned to those associated with the greenfield conditions of the site.

6.4.12 To control the rate and volumes of runoff discharged by the proposed development, SuDS will be utilised throughout the development site. The size and placement of these will be dictated by the constraints presented by topography and geology and the proposed site plan.

6.4.13 The Quick Storage Estimate (Design Suite for Micro Drainage) has been used to calculate the attenuation required for the peak discharge rates for all events up to the 1 in 100 year rainfall event, including an allowance for climate change, on the basis that they will be attenuated to the Greenfield rates. The results are summarised within Table 6-3. Full calculations can be found within Appendix H.

6.4.14 The attenuation required within the site is based on the upper estimate of the range of the QSE. This figure provides a conservative estimate of the volume of attenuation required to ensure the site does not discharge at a greater rate or volume than it does currently.

Table 6-3: Surface Water Attenuation Volume Calculations

Proposed Development Area (ha)	PIMP (%)	Impermeable Area (ha)	Return Period (yr)	Existing Greenfield Peak Discharge Rate (l/s)	Proposed Discharge Rate (l/s)	Required Storage Volume Range (QSE) (m^3)	Required Storage Volume (m^3)
9.31	83	7.74	1	16.8	16.8	1,070 – 1,676	1,676
			30	43.1	43.1	2,244 – 3,157	3,157
			100	61.1	61.1	2,858 – 3,928	3,928
			100 + CC (20%)	-	61.1	3,594 – 4,918	4,918

6.4.15 As the proposed development is being progressed as a hybrid application with full planning permission sought for the eastern side (Phase 1) of the site including the access road with the western side of the site (Phase 2) only seeking outline permission these two areas have been dealt with separately. Table 6.5 sets out the required attenuation volumes that need to be provided for the two separate areas.

Table 6.5: Storage requirements for different phases of the proposed development

Sub Area	Impermeable Area (ha)	Required Total Storage Volume (m^3)
Phase 1 (Eastern area including access road)	3.59	2,281
Phase 2 (Western area)	4.15	2,637

6.4.16 In Phase 1 the required storage volume will be provided by a combination of storage in tanks beneath permeable paving in the car parking areas and roads, and tank storage beneath the loading bay yards. These features will discharge via a pipe network to the Grand Union Canal. Refer to Drawing No. 0776-D-01 in Appendix H for proposed drainage strategy.

6.4.17 The storage beneath the permeable paving in the car parking areas is based upon a depth of 0.5m of granular sub-base with a void ratio of 0.3 above 0.5m deep geocellular storage with a void ratio of 0.95. These will be lined to prevent groundwater ingress into the tanks.

6.4.18 The car park in the north east corner of the site sits above the clay barrier and therefore the extent of sub surface storage is limited to the western half of this area. In addition shallow groundwater levels are present in this location; however the groundwater levels in this part of the site are artificially high due to irrigation of the ornamental trees and the sheet pile walls. On development of the site groundwater levels are expected to lower in this north-east corner. Groundwater levels below the southern car park are over 3m below proposed ground levels.

6.4.19 The storage beneath the loading bay yards is based upon a storage depth of 0.4m using geocellular storage with a void ratio of 0.95 and a required cover level of 1.2m. These will be lined to prevent groundwater ingress into the tanks.

6.4.20 Table 6.6 below sets out how the required storage volume will be provided across Phase 1 of the proposed development.

Table 6.6: Storage provision for Phase 1 of the proposed development

Storage Area	Storage Volume Provided (m^3)	Total Storage Volume Provided (m^3)	Total Storage Volume Required (m^3)
Northern Car Park	569	2,281	2,281
Southern Car Park	1,047		
Loading Bay Yard	665		

6.4.21 To prevent pollutants being discharged to the Grand Union Canal there will be an online oil interceptor located immediately prior upstream of the outfall to the Grand Union Canal and silt traps included in all gully pots. In addition a penstock will be installed at the outfall so that in the event of a pollutant spill this can be closed to protect the canal from the polluted discharge. In the loading bay yards surface water runoff will be collected using gravel filter trenches that will provide a first stage of water quality treatment.

6.4.22 Drawing No. 6337-D-01 (Appendix H) illustrates the provision of the required storage volumes for the areas of the proposed development for the 1 in 100 year plus climate change event, based on topography and layout.

6.4.23 Phase 2 of the proposed development will be drained using a combination of storage below car parking areas and loading bay yards, however the layout for this phase will be developed for a later reserved matters planning application.

6.4.24 The above drainage strategy demonstrates that the proposed development can be drained in a

sustainable manner without increasing the risk of flooding to neighbouring properties for events up to and including the 1 in 100 year plus climate change (30%) return period.

6.4.25 The drainage strategy is prepared in outline only to demonstrate the proposed development can meet national and local requirements which is appropriate for this planning application. Further development of the drainage strategy will be required during the detailed design stage of the project.

6.4.26 It should be noted that the above presents one possible solution to demonstrate that the development can be sustainably drained, to comply with the requirements of the NPPF. Other solutions may be feasible that would meet these criteria and may prove to be better suited to the site. These will become apparent during the detailed design stage. Therefore the strategy above should not therefore be interpreted as the definitive scheme solution.

6.4.27 Full drainage calculations are provided in Appendix H.

.

7 Flood Risk Management Measures

7.1 Introduction

7.1.1 Following a review of the flood risks to and arising from the proposed development; the following section discusses the mitigation measures necessary to ensure the proposed development remains safe over its lifetime and does not exacerbate flood risk to neighbouring property (including allowances for the effects of climate change).

7.2 Mitigation Measures

Existing Flood Mitigation

7.2.1 The Environment Agency has confirmed within their correspondence dated August 2014 that there are no formal flood defences benefitting the proposed development. Refer to Appendix C.

Post Development Flood Mitigation

Fluvial Flood Risk Management

7.2.2 As the whole site and access routes are located within Flood Zone 1 and the assessment of flood risk determined there is a negligible risk of the proposed development exacerbating fluvial flood risk to neighbouring property no mitigation measures are required for fluvial flood risk management.

7.2.3 Safe and dry access will be provided for the proposed development via Horton Road.

Surface Water / Pluvial Flood Risk Management

7.2.4 The indicative surface water drainage strategy demonstrates that the proposed development can be drained via SuDS techniques for events up to the 1 in 100 year event including an allowance for climate change (30% increase on peak rainfall intensity).

7.2.5 This surface water drainage strategy will also mitigate the current risk to the application site from pluvial / overland flow flooding.

7.2.6 To ensure the effective operation of the proposed development drainage network, non-return valves will be installed on all outfalls to restrict the backing up of the site drainage system when there are elevated water levels in the Grand Union Canal.

7.2.7 Finished site levels, where possible, will be engineered to provide positive drainage and prevent ponding. Gradients of external areas will be designed to fall away from buildings, such that any overland flow resulting from extreme events will follow the path of least resistance, follow natural topography and be channelled away from the entrances of buildings. The accumulation of standing water will therefore be minimised and thus not pose a significant risk.

8 Conclusions

8.1 Conclusion

8.1.1 WSP was commissioned by Prologis in January 2015 to prepare a site specific Flood Risk Assessment (FRA) and drainage strategy for a proposed development at Prologis Park, West London.

8.1.2 Permission is sought for the proposed development comprising a hybrid application for the phased comprehensive redevelopment of the site to provide an overall maximum gross floorspace of 45,000sqm of Light Industrial uses (Use Class B1c and / or Use Class B2) and / or Storage and Distribution uses (Use Class B8) and ancillary offices, together with servicing, parking, access roads and open space. Full planning permission is sought for Phase 1 containing 18,900sqm of floorspace in two buildings up to 16.2m in height (to ridge), together with associated highways works, open space, hard and soft landscaping, car parking and associated infrastructure. Outline planning permission is sought for Phase 2 for up to 26,100sqm of floorspace with all matters except for access reserved for later determination.

8.1.3 The application site is entirely located in Flood Zone 1. Land in Flood Zone 1 has an annual probability of flooding from rivers or the sea greater than 1 in 1000 years (0.1% AEP).

8.1.4 The flood risk to and from the proposed development from coastal and tidal, fluvial and groundwater sources is classified as negligible. Without mitigation measures, the flood risk from Pluvial / Overland Flow Sources to and from the proposed development is classified as moderate.

8.1.5 Without mitigation measures, the risk of the proposed development exacerbating flood risks from pluvial/overland flood sources and artificial sources is assessed as being moderate. To mitigate this risk a SuDS management train for surface water drainage will be implemented in accordance with the SuDS Manual.

8.1.6 For the preliminary surface water drainage strategy, all storage will be provided by a combination of, tank storage beneath permeable paving in the car parking areas and tank storage beneath the loading bay yards. These have been designed to attenuate flows for all rainfall events up to and including the 1 in 100 year event including allowance for climate change (+30% increase in peak rainfall intensity) based on greenfield discharges to the Grand Union Canal. Pollution prevention measures including silt traps, an oil interceptor and a penstock will be incorporated into the drainage system to protect the receiving water body from pollutants arising from the site.

8.1.7 The proposed development will have a maximum attenuated discharge of 61.4 l/s (5.1 l/s/ha) for the 1 in 100 year rainfall event including an allowance for climate change.

8.1.8 The indicative drainage strategy has been prepared to support the proposed development through the hybrid planning process; the strategy is subject to change upon further information obtained from relevant stakeholders and third parties. However, the strategy has been prepared such that it is robust, complies with the requirements of the NPPF and PPG, and does not increase flood risk either to or from the application site.

8.1.9 Safe and dry access will be provided for the proposed development via Horton Road.

Appendices

Appendix A - Parameters Plan

- Drawing No. 27122/PL/056A



01
56

SITE LAYOUT
1:1000

0 25 50 100m

NOTES:

SUBJECT TO STATUTORY CONSENTS

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N

BASED ON:
GREENHATCH GROUP'S TOPOGRAPHICAL SURVEY.
DRAWING 21053_OGL. REV 0.
DATED: DEC 2014.

BASED ON:
BARRY CHINN ASSOCIATES ILLUSTRATIVE LANDSCAPE CONCEPT.
DRAWING: 1469/14. -03- REV A
DATED: FEB 2015.

REV	DATE	NOTE	DRAW	CHCK
..	24-02-15	LANDSCAPING UPDATED	PF	MS

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PROLOGIS

TITLE
PROLOGIS PARK, WEST LONDON

DRAWING
SITE LAYOUT AND PARAMETERS PLAN

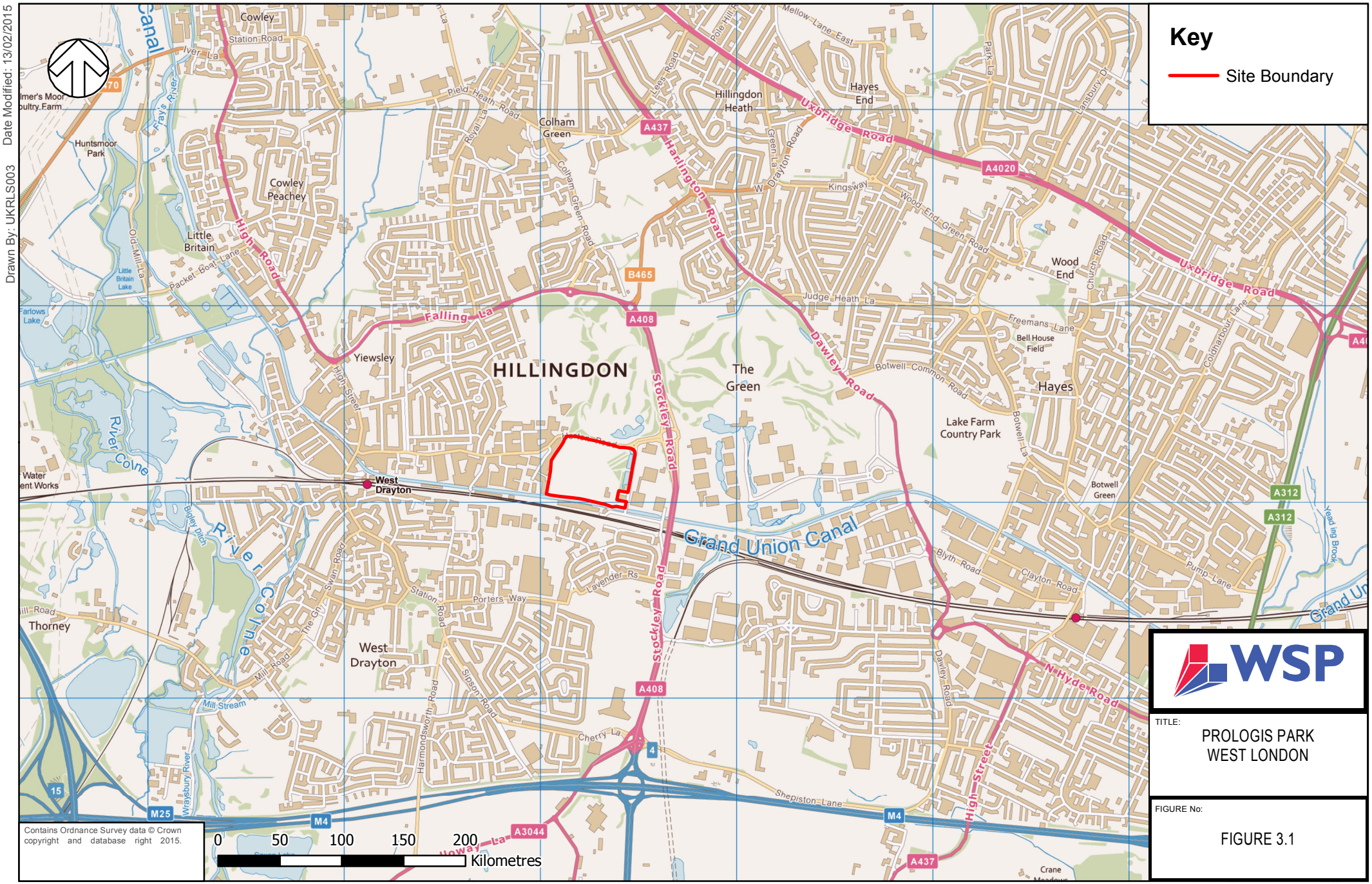
CLIENT
PROLOGIS UK LTD

DATE	SCALE	DRAWN
JAN 2015	1:1000	PF
	STATUS: PLANNING	CHECKED: MS/GZ

DRAWING NUMBER
27122 / PL / 056A

Appendix B - Site Location Plans

- Figure 3.1 – General Site Location Plan
- Figure 3.2 – Detailed Site Location Plan



File: \\ser02col2uk\gisdata\WSP_UK\WSP_D\Basing\70006377 Stockley Park PH3\Data\Map Document\FRA\Figure 3.1 Overview Location Map.mxd

Drawn By: UKRLS003 Date Modified: 13/02/2015



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WSP

TITLE:
PROLOGIS PARK
WEST LONDON

FIGURE No:
FIGURE 3.2

File: \\ser02col2uk\gisdata\WSP_UK\WSP_D\Basing\70006377 Stockley Park PH3\Data\Map Document\FRA\Figure 3.2 Detailed Location Map.mxd

Appendix C - Stakeholder Correspondence

- Environment Agency
- Thames Water
- Affinity Water
- London Borough of Hillingdon
- Canal and River Trust (to be added once received)

Environment Agency Correspondence

Richard Stevens

C/O Email:
Richard.Stevens@wspgroup.com

Our ref: HNL/045657/JH

Date: 25 February 2015

Dear Richard

Enquiry regarding Stockley Park, Yiewsley Flood Risk Assessment

Thank you for your enquiry which was received on 5 February 2015 and subsequent payment received on 16 February 2015

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

1. A detailed fluvial flood map for the area. We already have access to the Flood Maps provided on the Environment Agency's website.

   Please find attached a flood zone map and a flood risk map, both show thet the site is outside the flood plain (zone 2 & 3)

2. A detailed surface water flood map for the area. Please could the Environment Agency confirm the level of risk to the site from surface water flooding. We already have access to the Risk of Flooding from Surface Water Maps on the Environment Agency's website.

   Please find attached a surface water flood risk map, this is created using local laed flood authority data so we only can supply copies of the map. For more details please refer to the following weblinks.
   https://www.gov.uk/government/publications/flood-maps-for-surface-water-how-they-were-produced
   https://www.gov.uk/government/publications/flood-risk-maps-for-surface-water-how-to-use-the-map

3. Historical records of flooding at or within the vicinity of the site, including groundwater flooding. If the Environment Agency does not hold any records, please can you confirm that the site has no record of flooding in the past.

   Please find attached a copy of the historic flood map, there is no history of flooding. For surface water and ground water information please contact the local lead flood authority (London borough of Hillingdon)

4. The Aquifer classification for the area.

   Please see aquifier bedrock and superficial maps. The uppermost superficial deposit is sand and gravel, which is designated a **Principal Aquifers** are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifers. The uppermost bedrock is London clay,

which is designated a **Unproductive strata** are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

You can find more information on aquifer designation on our 'What's in your backyard' pages at http://apps.environment-agency.gov.uk/wiyby/117020.aspx.

Aquifer maps can be viewed online at http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=groundwater.

5. Protection Zones at or within 500m of the site.

   Please find attached a Source Protection Zone Map for the area, the site is outside the source protection zone. You can view our Source Protection Zone maps on our 'What's in your backyard' pages at http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=groundwater

6. Groundwater levels on or within 500m of the site.

   Please find attached a groundwater contour map for the area. There are water bearing sandy layers at the ground surface in your area. These layers may maintain a shallow groundwater table, which is directly refilled by rainfall, rather than by a large body of deep groundwater. We do not monitor this groundwater table. We are not responsible for the drainage of private properties or for issues caused by high groundwater tables, whether natural or man-made. Local Lead Flooding Authorities (London Borough of Hillingdon) are responsible for managing flooding from groundwater. Your LLFA is London Borough of Hillingdon. Please contact your LLFA to understand what data and services are available.

7. Any additional flood data the Environment Agency considers useful for the above site.

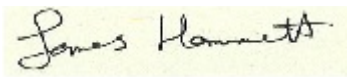
   Please contact your LLFA (London Borough of Hillingdon) as they may hold more information on flood risk in the area. Also please contact the Canals and Rivers Trust as the Grand Union Canal is close to your development area.

I have attached our Standard Notice which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

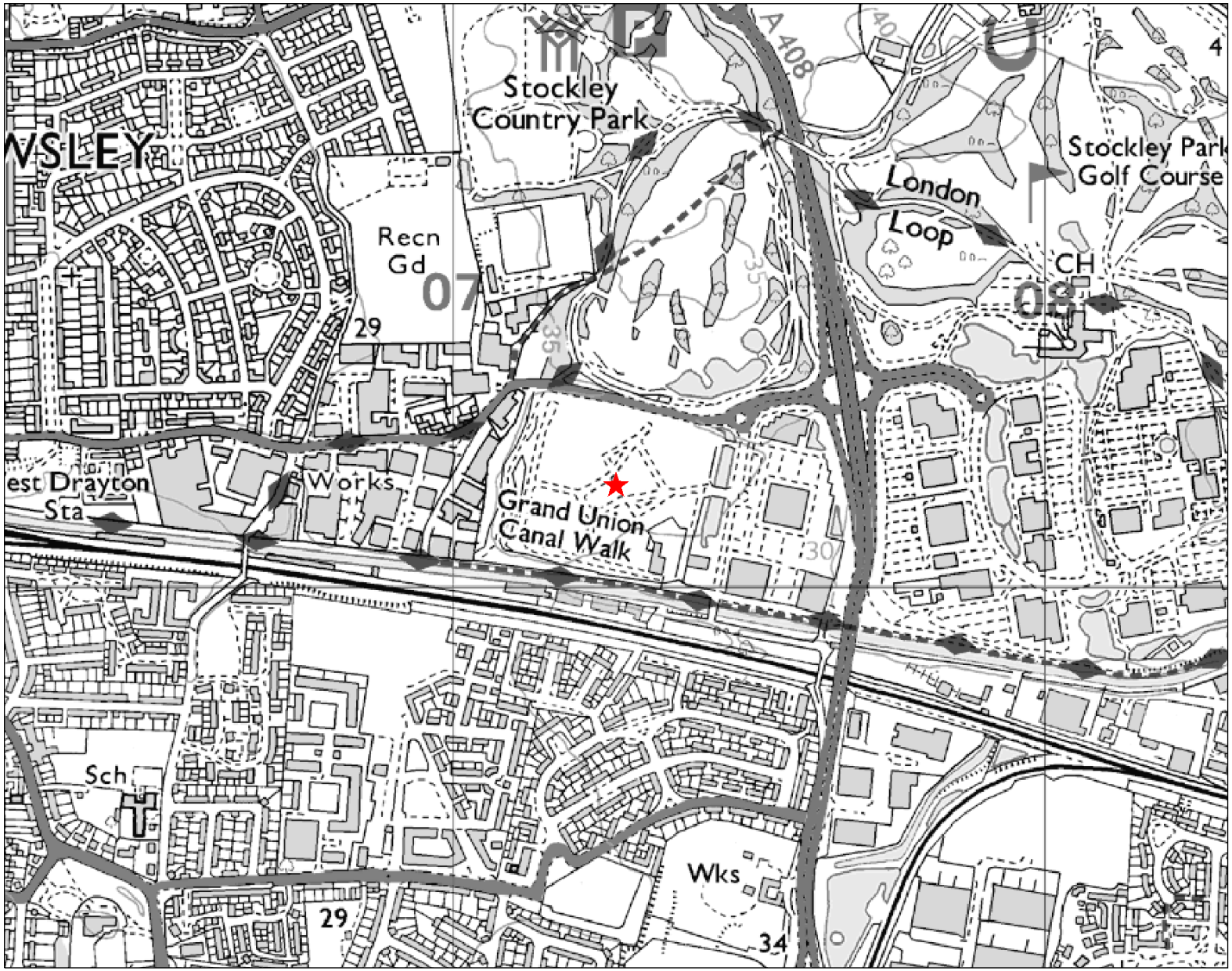
We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive: http://feedback1.environmentagency.uk.com/s3/HNLCustomer

Yours sincerely



Customers and Engagement Officer
Direct dial 01707 632 468
Direct fax 01707 632 610
Direct email HNLenquiries@environment-agency.gov.uk

Flood zone map Created 25 February 2015 Ref: HNL/045657/JH



Environment Agency

Scale 1:10,001

N W E S

Flood Map for Planning (Rivers and Sea)

- Flood Map - Defences
- Areas Benefiting from Flood Defences
- Flood Map - Flood Storage Areas
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2

Flood Map for Planning (Rivers and Sea) (assuming no defences)

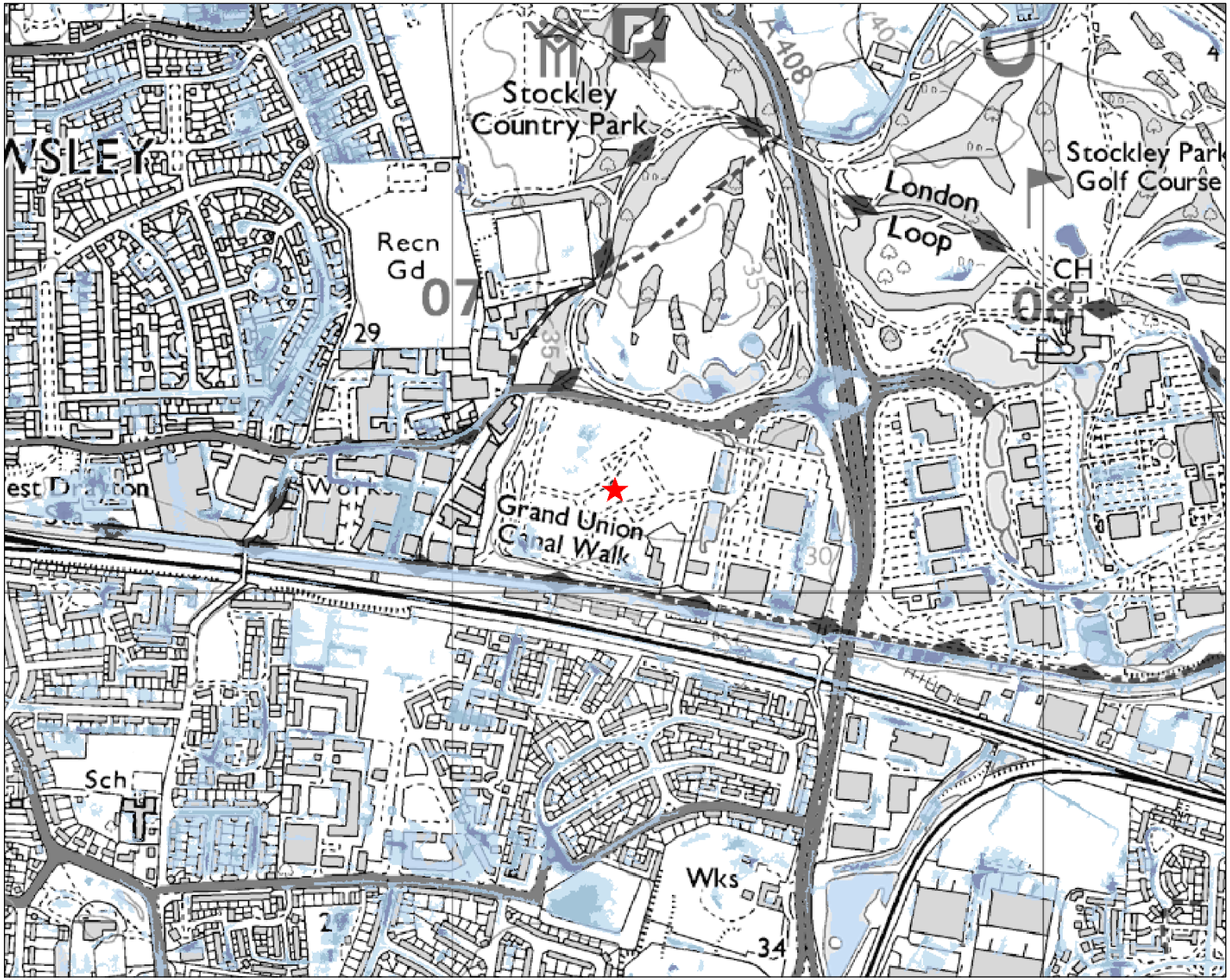
Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

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.

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

Risk of flooding from Surface Water – Created 25 February 2015 Ref: HNL/045657/JH



Environment Agency

Scale 1:10,001

N W E S

Likelihood of flooding from Surface Water

- High
- Medium
- Low
- Very Low

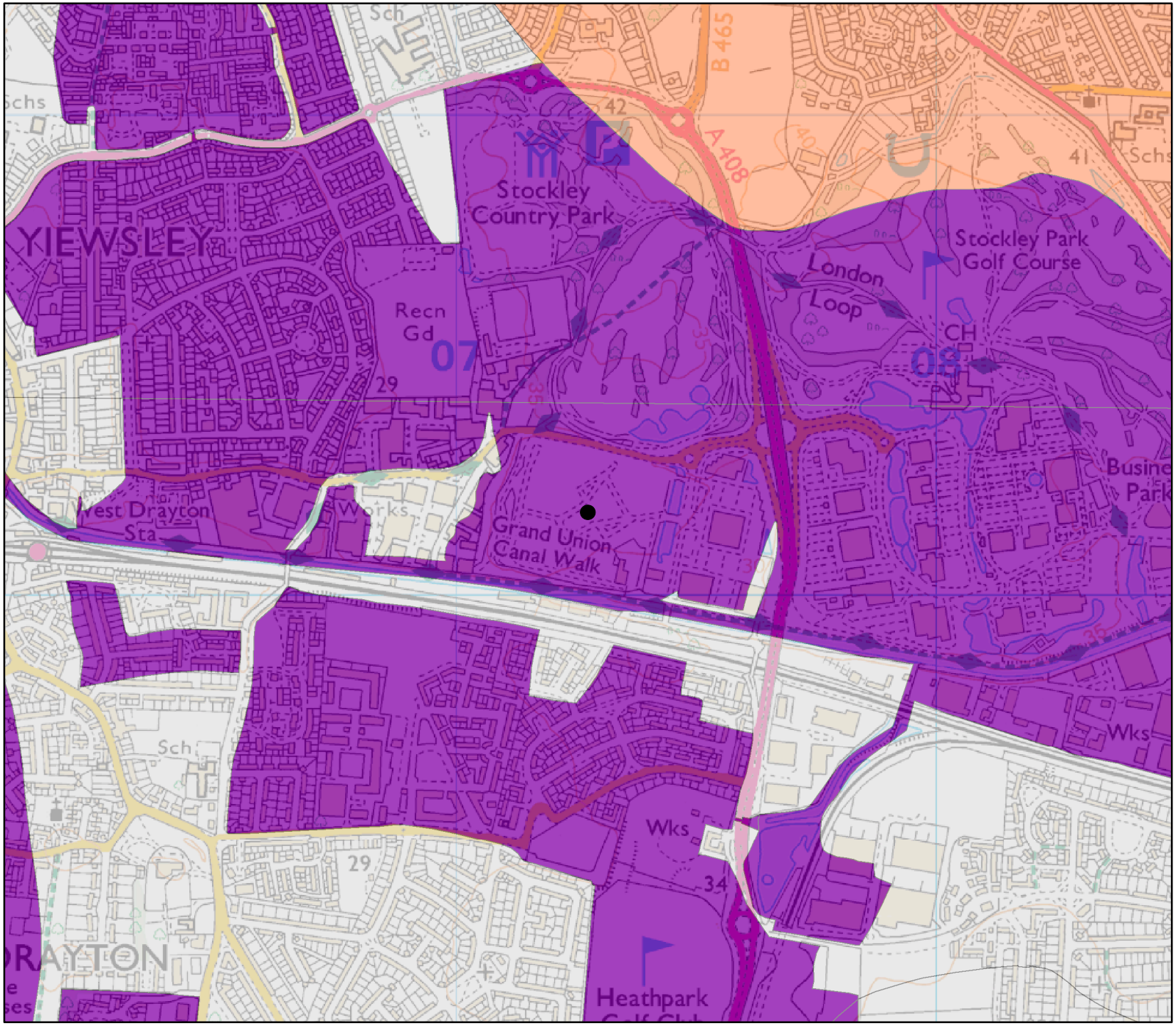
Likelihood of flooding from Surface Water

High:	Greater than or equal to 1 in 30 (3.3%) chance in any given year
Medium:	Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year
Low:	Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
Very Low:	Less than 1 in 1,000 (0.1%) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.

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



Environment Agency
2 Bishops Square Business Park
St Albans Road West
Hatfield
Hertfordshire
AL10 9EX

HNL/045657/JH

25 February 2015

Legend

Aquifer_Superficial

- <all other values>

Aquifer

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unknown (lakes+landslip)
- Unproductive

N
W E
S

0 75 150 300 450 600

Metres

Produced by:
Customer and Engagement
Hertfordshire and North London

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Thames Water Correspondence

Sewer Flooding
History Enquiry

WSP UK Ltd

Basing View

Search address supplied Stockley Park
Yiewsley

Your reference N/A

Our reference SFH/SFH Standard/2015_2970150

Received date **13 February 2015**

Search date **13 February 2015**

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

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

Sewer Flooding

History Enquiry

Search address supplied: Stockley Park,Yiewsley

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

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Slough SL1 4WW

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

Sewer Flooding

History Enquiry

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

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

Asset Location Search

WSP UK Ltd
Mountbatten House
Basing View
BASINGSTOKE
RG21 4HJ

Search address supplied Stockley Park
Yiewsley

Your reference N/A

Our reference ALS/ALS Standard/2015_2970155

Search date 13 February 2015

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

searchcode

Asset Location Search

Search address supplied: Stockley Park, Yiewsley,

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

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

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

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

Asset Location Search

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ0780SW
TQ0780SE
TQ0779NW

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.

Following examination of our statutory maps, Thames Water has been unable to find any plans of water mains within this area. If you require a connection to the public

water supply system, please write to:

New Connections / Diversions
Thames Water
Network Services Business Centre
Brentford
Middlesex
TW8 0EE

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TQ0780SW Affinity Water
TQ0780SE Affinity Water
TQ0779NW Affinity Water

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ

Tel: 0845 7823333

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

Asset Location Search

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2015_2970155

TQ0780SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 507250,180250

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.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

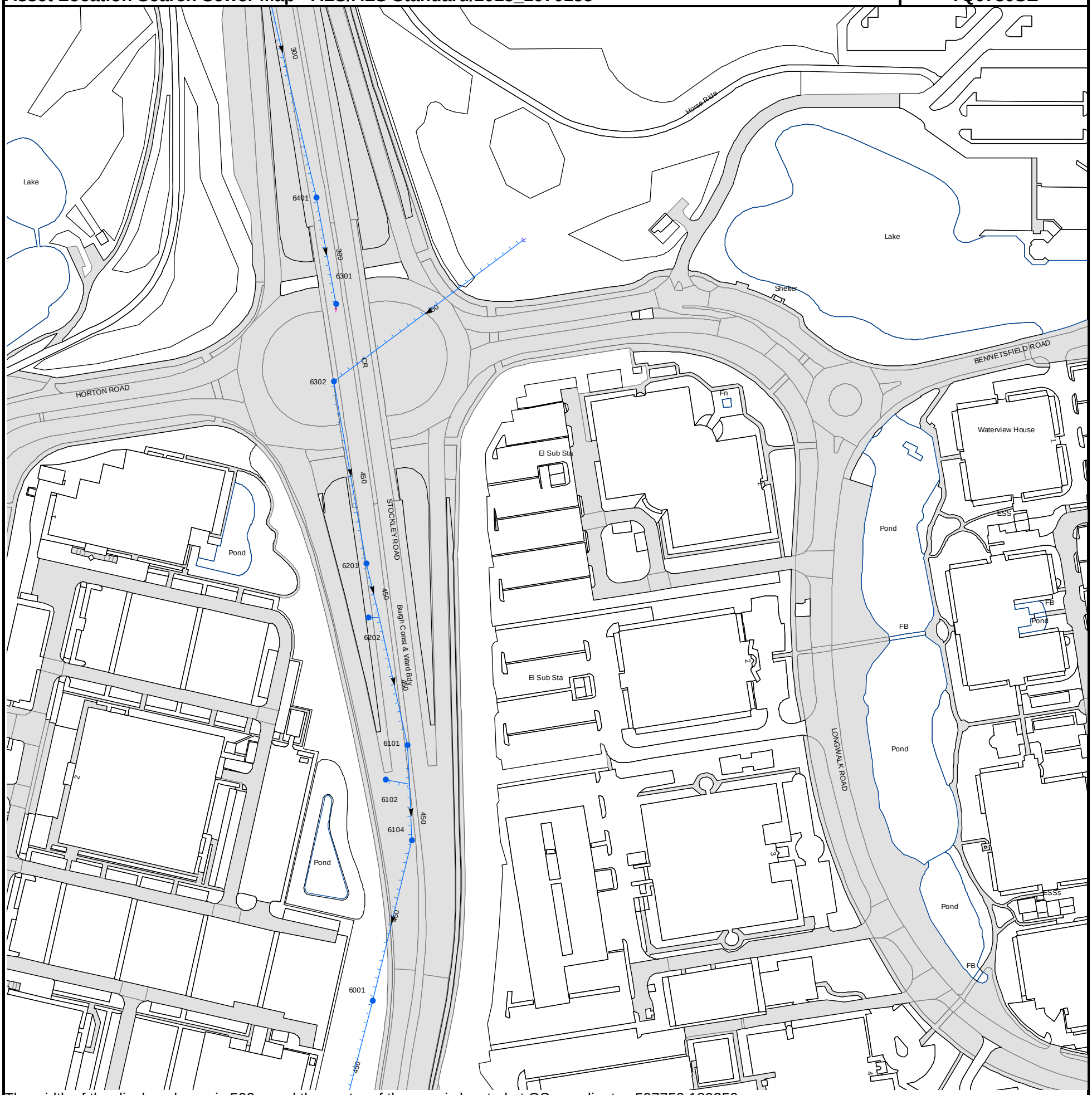
NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0306	32.48	31.11
0304	n/a	n/a
1301	n/a	n/a
1303	33.08	31.29
0205	31.51	29.66
011A	n/a	n/a
0206	30.56	29.24
0202	30.79	29.81
0207	30.67	29.58
0203	30.99	30.14
0204	30.97	30.27
0211	31	29.36
0209	31.29	30.55
0208	31.21	29.51
0212	31.64	30.19
0301	n/a	30.1
0302	31.72	30.46
0303	32.13	30.3
0305	32.19	30.92
1305	33.24	32.17
1304	34.9	32.28
0101	30.65	29.68

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.

Asset Location Search Sewer Map - ALS/ALS Standard/2015_2970155

TQ0780SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 507750,180250

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.

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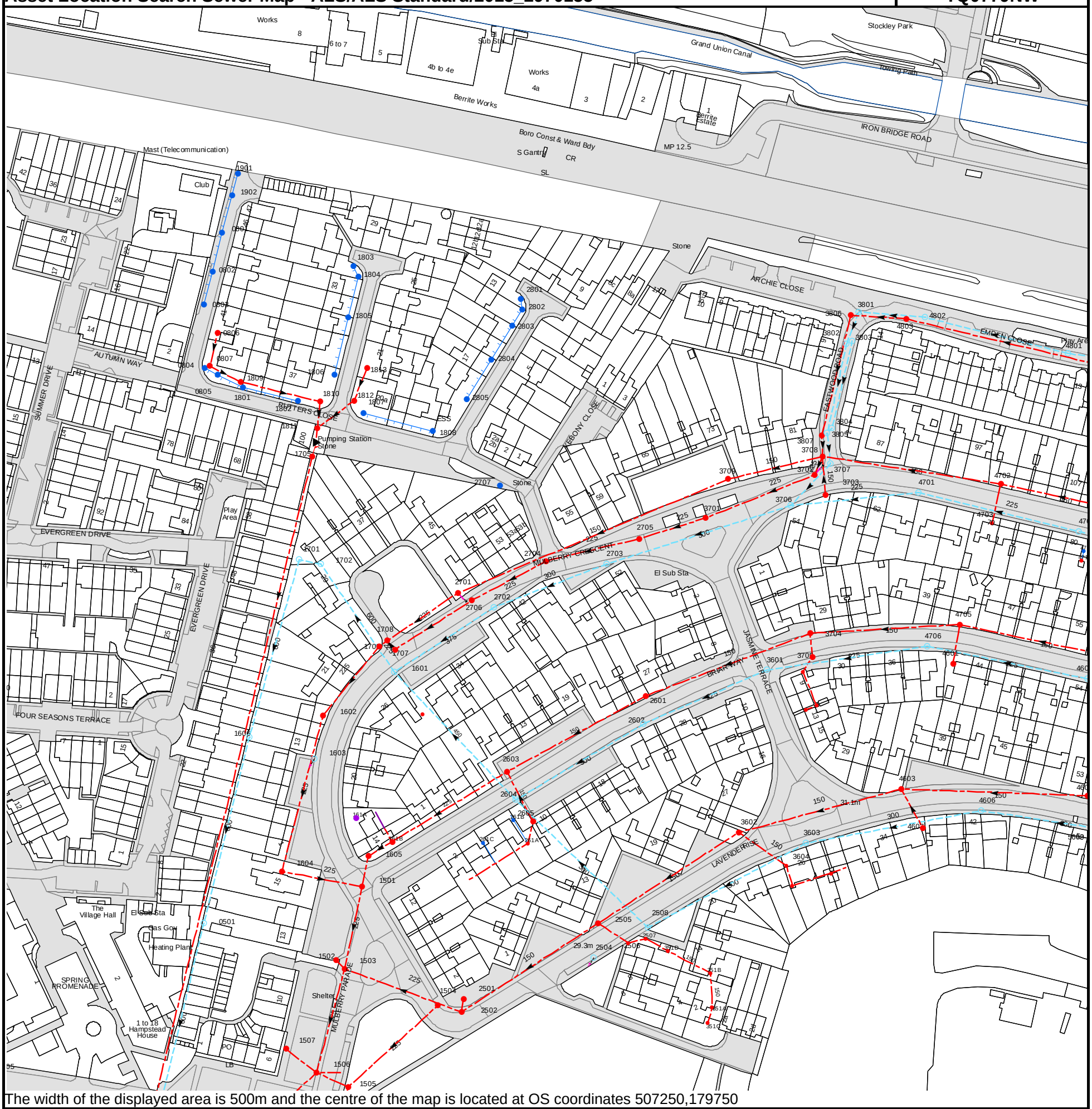
NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6401	35.85	35.05
6301	35.4	34.48
6302	n/a	n/a
6201	n/a	n/a
6202	n/a	n/a
6001	n/a	n/a
6102	n/a	n/a
6101	n/a	n/a
6104	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.

Asset Location Search Sewer Map - ALS/ALS Standard/2015_2970155

TQ0779NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 507250,179750

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.

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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
1902	n/a	n/a
1901	n/a	n/a
1805	n/a	n/a
1803	n/a	n/a
1812	n/a	n/a
1804	n/a	n/a
1807	n/a	n/a
1813	n/a	n/a
1708	n/a	27.72
1808	n/a	n/a
2701	29.9	27.98
2805	n/a	n/a
2706	n/a	27.94
2804	n/a	n/a
2702	29.87	28.37
2707	n/a	n/a
2803	n/a	n/a
2801	n/a	n/a
2802	n/a	n/a
2704	n/a	28.12
2703	30.22	28.53
2705	n/a	28.41
3701	n/a	28.6
3709	31.19	28.83
3706	31.01	29
3704	31.07	28.72
3702	31.85	28.91
3807	n/a	n/a
3708	31.85	29.28
3703	31.46	29.5
3805	n/a	n/a
3707	n/a	n/a
3804	n/a	n/a
3802	n/a	n/a
3806	n/a	n/a
3803	n/a	n/a
3801	n/a	n/a
4803	n/a	n/a
4701	31.56	29.47
4802	n/a	n/a
4706	31.29	29.35
4705	31.5	29.35
4703	31.87	29.99
4702	31.88	29.83
4801	n/a	n/a
4704	31.9	29.94
471B	n/a	n/a
471A	n/a	n/a
1506	29.23	27.07
1811	n/a	n/a
1810	n/a	n/a
1702	29.57	28.1
1602	n/a	n/a
1806	n/a	n/a
1502	28.89	27.47
2506	29.68	27.97
2602	30.11	28.35
2601	30.25	28.21
2507	29.88	28.24
2508	29.85	28.45
351C	n/a	n/a
351A	n/a	n/a
3602	30.65	28.49
3601	30.46	28.77
3604	31.36	28.95
351E	n/a	n/a
361D	n/a	n/a
3603	30.96	29.16
361B	n/a	n/a
3705	30.89	28.89
361C	n/a	n/a
361A	n/a	n/a
4603	31.53	29.25
4607	31.66	29.65
351D	n/a	n/a
4606	31.75	29.7
4604	32.46	30.03
4602	32.27	30.15
4601	31.48	29.84
161A	n/a	n/a
1501	28.59	27.42
1605	28.88	27.43
1703	29.51	27.82
161B	n/a	n/a
1601	29.37	28.15
1707	n/a	27.75
161C	n/a	n/a
261C	n/a	n/a
2603	29.44	27.61

Manhole Reference	Manhole Cover Level	Manhole Invert Level
261B	n/a	n/a
2604	29.22	28.19
261A	n/a	n/a
2605	29.53	27.81
2505	29.62	27.89
1507	28.64	27.44
0501	29.27	28
1604	28.91	27.49
1603	29.09	28.17
1606	29.31	28.09
1701	29.36	28.13
1705	n/a	n/a
1802	n/a	n/a
1801	n/a	n/a
1809	n/a	n/a
0805	n/a	n/a
0804	n/a	n/a
0807	n/a	n/a
0806	n/a	n/a
0803	n/a	n/a
0802	n/a	n/a
0801	n/a	n/a
151A	29.33	26.774
2502	28.62	27.34
1504	28.47	27.36
2501	28.78	27.48
351B	n/a	n/a
1503	28.78	27.3
2504	29.42	28.07

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.

Terms and Conditions

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

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

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

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

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to him at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0845 070 9148** quoting your invoice number starting CBA or ADS.	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

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- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Affinity Water Correspondence

Stockley Park, Yiewsley

10/02/2015

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Plans are continuously being updated, so out of date plans should be destroyed and not relied upon. The position of apparatus shown on this plan is provided for guidance only and should not be relied upon as being precise. Therefore the Company accepts no responsibility in the event of inaccuracy. Service pipes are not necessarily shown on this plan. Cover is normally 915mm for mains and 750mm for communication pipes but this may vary.
The actual position of apparatus must be determined on site by making hand dug trial holes. The Company requires a minimum of two working days notice of the intention to excavate trial holes.
Except where prior written permission has been obtained, it is an offence under Section 174 of the Water Industry Act 1991 to operate or interfere with any valves, hydrants or other apparatus vested in Affinity Water.

1:1,250

N

This map was created by the Affinity Water Asset Information Team, Tamblin Way, Hatfield, AL10 9EZ

- Distribution Main
- Asbestos Distribution Main
- Abandoned Main
- Asbestos Abandoned Main
- Adit / Tunnel
- Cable
- Hydrant
- Fitting
- Easement
- Company Boundary

London Borough of Hillingdon Correspondence

Stevens, Richard

From: Victoria Boorman <vboorman@hillingdon.gov.uk>
Sent: 05 February 2015 16:36
To: Stevens, Richard
Subject: Fwd: Flood Risk Assessment - Enquiry

Follow Up Flag: Follow up
Flag Status: Completed

Dear Richard

I have been forwarded your query. I am not aware of any incidences of flooding reported in the vicinity of this site.

regards

Vicky

Vicky Boorman
Flood and Water Management Specialist
Contact Centre: 01895 556000
Email: vboorman@hillingdon.gov.uk

Planning Specialists Team 3N/02
Residents Services
London Borough of Hillingdon (Directions)
Civic Centre, High Street,
Uxbridge. Middlesex. UB8 1UW

For more information on flooding please visit the Hillingdon website.
http://www.hillingdon.gov.uk/flooding

---------- Forwarded message ----------
From: **Stevens, Richard** <Richard.Stevens@wspgroup.com>
Date: 3 February 2015 at 14:07
Subject: Flood Risk Assessment - Enquiry
To: Vinod Mawdia <vmawdia@hillingdon.gov.uk>

Dear Sir

Stockley Park, Yiewsley

Flood Risk Assessment – Enquiry

We have been instructed by our client to carry out a Flood Risk Assessment for the proposed development at the above site and I have been given your name by my colleague as a possible contact with regards to flood risk and drainage.

The site is shown within undefended Flood Zone 1. The OS grid reference for the site is 507282, 180165 and the nearest postcode is UB11 1PA. Please fine enclosed location maps for your reference.

With regards to completing the above in compliance with the National Planning Policy Framework (NPPF), please could the London Borough of Hillingdon, as Lead Local Flood Authority, provide any **historic records of flooding in the vicinity of the site**.

We trust the above to be satisfactory, however, should you have any queries or require any further information from WSP to be able to answer the above queries, please do not hesitate to contact the undersigned.

Kind Regards

Richard Stevens

Richard Stevens BSc (Hons) MSc MCIWEM C.WEM CSci

Senior Engineer

WSP in the UK, Mountbatten House, Basing View, Basingstoke, Hampshire, RG21 4HJ
Tel: +44 (0)1256 318746

Website: www.wspgroup.co.uk

We are WSP

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Canal and Rivers Trust Correspondence

Appendix D – Topographical Survey



N

Station Information:

Station	Easting (m)	Northing (m)	Level (m)
W1	507445.371	179988.409	33.905
W2	507382.459	180002.981	33.473
W3	507298.257	180022.004	32.408
W4	507222.594	180039.069	33.534
W5	507120.134	180073.512	32.409
W6	507125.974	180176.920	33.750
W7	507158.204	180275.334	33.594
W8	507287.194	180243.839	36.252
W9	507320.431	180156.169	35.796
W10	507424.115	180161.615	34.346
W11	507401.990	180066.072	33.530
W100	507464.237	180091.105	34.107
B1	507370.367	180089.240	32.941
B2	507337.205	180051.633	32.855
L1	507485.626	180270.169	35.148
ME5	507399.855	180290.949	36.098
ME6	507166.086	180343.694	33.690

OS Note:

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only.

OS Buildings *Surveyed Buildings*

This survey has been orientated to the Ordnance Survey (O.S) National Grid (OSGB36) via Global Navigational Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN02 & OSGM02 transformation models.
The survey has been correlated to this point and a further one or more OSGB36 points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

Legend:

Buildings
Edge
Kerb line
Line marking
Drop kerb
Dropped kerb
Centre line
Station and Name
Station Level
100.000
Tree / Bush / Sapling
Area of Undergrowth
Woodland
Ridge Level
Eaves Level
Flat Roof Level
Gate
Fence types:
Hedgerow
Iron Railings
Wire Mesh
Post & Rail
Post & Wire
Chain Link
Wooden Panels
Concrete Panels
Steel Palisade
Overhead Cables
Concrete edge
Concrete ridge
Tarmac edge
Grass verge
Canopy/Overhang
Verge
IC Inspection chamber
PAV Pipe invert
Gy Gully
Bg Back gully
Dg Down pipe
Pipe Pipe above ground
MH Manhole
WL Water level
FL Fixed light
Lp Lamp post
Tp Telegraph post
Ep Electricity post
Tl Traffic light
Bus Bus stop
Sn Stop sign
St Stop tap
Er Earth rail
WR Water meter
Gas Gas valve
Av Air valve
ICU Unidentified inspection
Wo Wash out
Ra Railding rail
BB Belisha beacon
CTV Cable tv
Mo Marker post
GasM Gas marker post
Sy Sytty
Bollard
Illuminated bollard
Bin Rubbish bin
Vp Vent pipe
Gnl Ground light
Lbox Letter box
LtP Lattice
Sky Side
PL Internal floor level
THL Threshold level
Sp Sign post
Tra Trashale
BH Borehole
ELC Electric
BT British Telecom
CTele Control box
TT Tracky
BP British guard
CPS Concrete paving kerbs
Cvlt Cover
IC Inspection chamber
Rwall Runaway wall
UTL Unable to fit
TCL Tree canopy lived
G Grate
MS Multi pith
Stmp Tree Stump
CL Cover level
IL Invert level

Rev	Date	Description	Drawn	Q. Ref
1	02.02.15	Additional Survey	ME	

greenhatch group

- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

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Duffield Road
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Poland: ul. Paprocnicka 91, 40-751 Katowice, Poland, t. 0048 32 202 2292, www.greenhatch.pl

CLIENT
Barry Chinn Associates

PROJECT
Stockley Park Hayes

TITLE
Topographical Survey

SCALE	DATE
A0@ 1: 500	Dec 2014
DRAWN	QUALITY REF
WA	Draft

Level datum	See OS Note
Grid orientation	See OS Note
Job number	21053
Drawing No.	Rev.
21053_OGL	0

Comments
This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

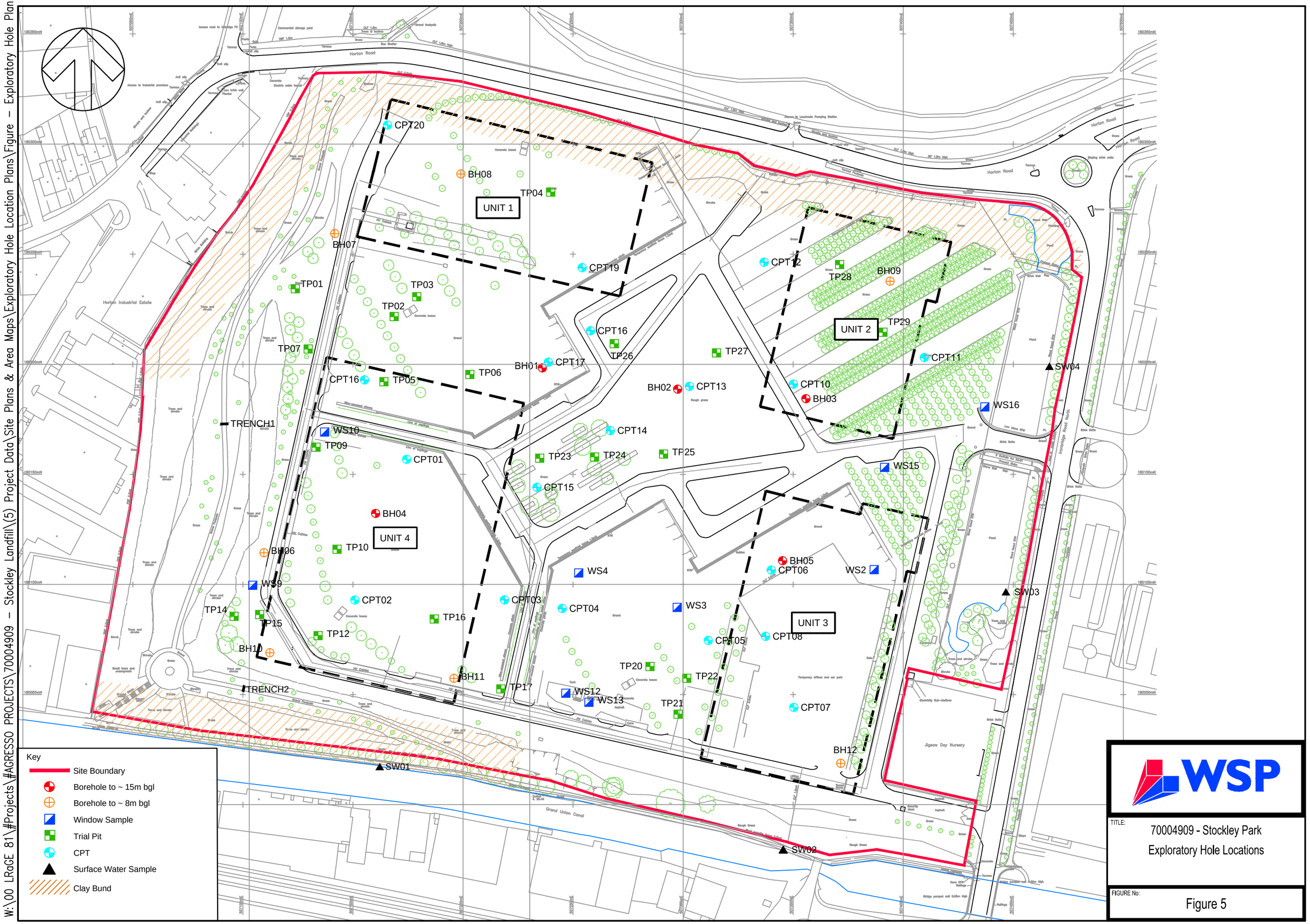
Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

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Appendix E – Clay Bund Geotechnical Investigation

W:\00 LRaGE 81\#Projects\#AGRESSO PROJECTS\70004909 - Stockley Landfill\(5) Project Data\Site Plans & Area Maps\Exploratory Hole Location Plans\Figure - Exploratory Hole Plan



WSP

TITLE:
70004909 - Stockley Park
Exploratory Hole Locations

FIGURE No:
Figure 5

Appendix F – Hillingdon Surface Water Management Plan Figures

- Figure 5.2: 1 in 100 year rainfall event depth and recorded surface water flood incidents
- Figure 9.2: Recorded incidents of Sewer Flooding
- Figure 10.2: Increased Potential for Elevated Groundwater Map

THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED

NORTH

HILLINGDON
UXBRIDGE
HAYES
YIEWSLEY
WEST DRAYTON
SOUTH BUCKS
SLOUGH
SPELTHORNE
HOUNSLOW
EALING
Heathrow Airport London
Terminal 1
Terminal 2
Terminal 3
Terminal 4
Terminal 5
Queen's Building
Stockley Country Park
Grand Union Canal
Harlington
Harmondsworth
Cranford
Yeading
Hayes End
Hayes Town
Wood End Green
Hillingdon Heath
Cowley
Colham Green
Sipson
Longford
Hounslow Heath

0 0.25 0.5 1 1.5 2 Kilometres

Legend

- Borough Administrative Boundary
- Main River
- Ordinary Watercourse
- Culverted Watercourse (Main River)
- Permanent Water Bodies
- Surface Water Flooding Incidents
- Surface Water Flood Outline

Flood Depth

< 0.1m	0.5m - 1.0m
0.1m - 0.25m	1.0m - 1.5m
0.25m - 0.5m	> 1.5m

Notes

1. This map only shows the predicted likelihood of surface water flooding (this includes flooding from sewers, drains, small watercourses and ditches that occurs in heavy rainfall) for defined areas, and due to the coarse nature of the source data used, are not detailed enough to account for precise addresses.
2. Users of this map should refer to section 3.2 of the Surface Water Management Plan for a complete description of limitations and accuracy of the flood/hazard extents shown.

London Borough of Hillingdon

HILLINGDON LONDON

Surface Water Management Plan

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Scale at A3	Date	Drawn by	Approved by
1:40,000	08/04/2011	R.MOORE	P.HLINOVSKY

1 in 100 year rainfall event depth and recorded surface water flood incidents

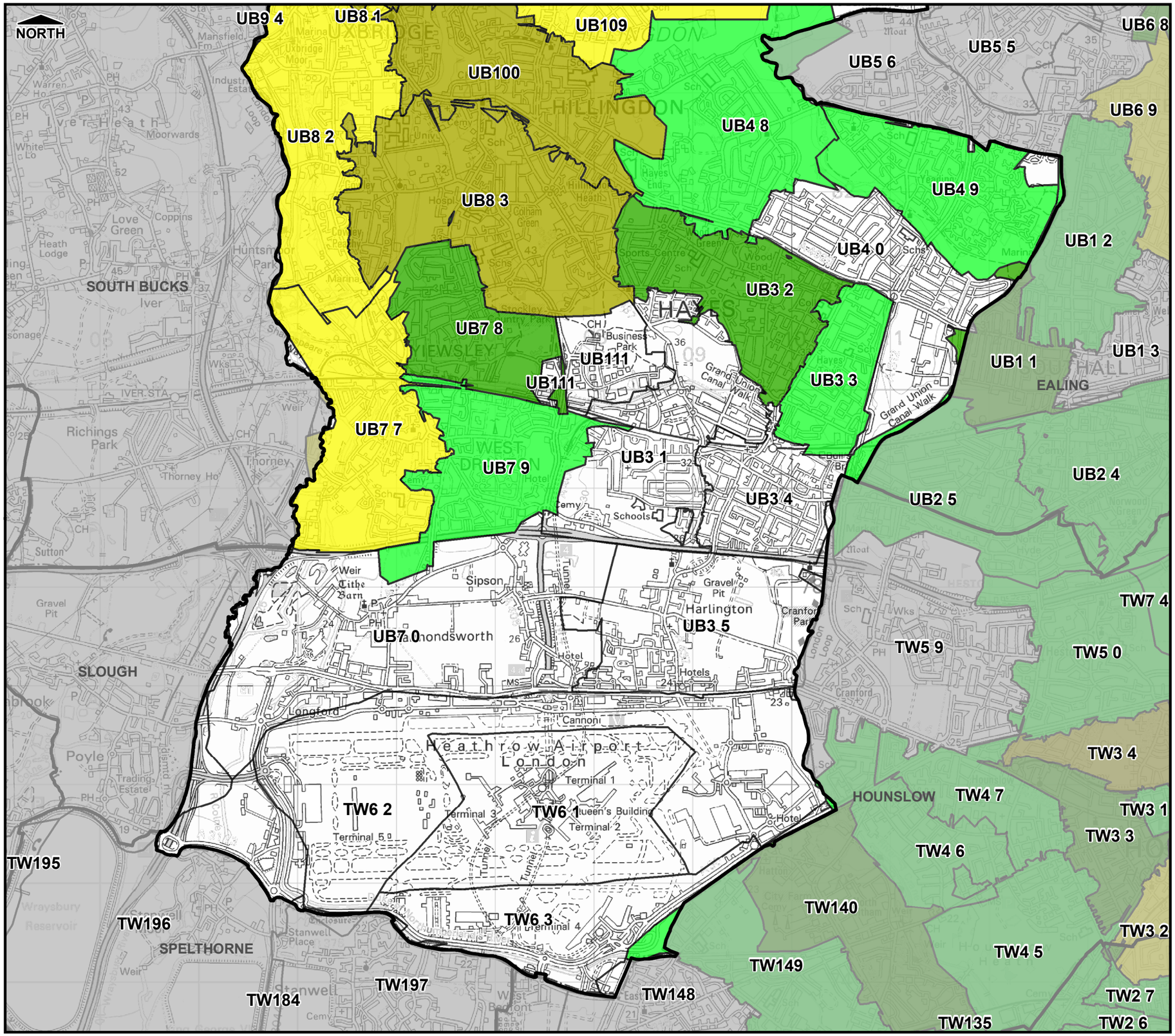
Consultants
CAPITA SYMONDS Scott Wilson
Flood Risk Management
Capita Symonds
Level Seven,
52 Grosvenor Gardens,
Belgravia,
London
SW1W 0AU

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FIGURE 5.2

Filepath: L:\Environment\zwet\CS046913_DrainLondon_Tier2\Group1\ARC\mxds\GP1_Hillingdon_Fig5.2_Depth_SWIncidents_100.mxd



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED

Legend

- Borough Administrative Boundary
- Sewer Flooding Incidents
- Sewer Flood Outline

No. of Sewer Flood Records

- None
- 1 - 5
- 6 - 10
- 11 - 20
- 21 - 50
- 51 - 100
- 101+

Notes

London Borough of Hillingdon

HILLINGDON LONDON

Surface Water Management Plan

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1:40,000	06/04/2011	R.MOORE	P.HLINOVSKY

Recorded Incidents of Sewer Flooding

Consultants
CAPITA SYMONDS Flood Risk Management
Scott Wilson
Capita Symonds
Level Seven,
52 Grosvenor Gardens,
Belgravia,
London
SW1W 0AU

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FIGURE 9.2

Filepath: L:\Environment\zwet\CS046913_DrainLondon_Tier2\Group1\ARC\mxds\GP1_Hillingdon_Fig9.2_SewerIncidents.mxd

THIS DRAWING MAY BE USED ONLY FOR
THE PURPOSE INTENDED

Legend

- Borough Administrative Boundary
- Main River
- Ordinary Watercourse
- Culverted Watercourse (Main River)
- Groundwater Flood Incident (EA Records)
- Groundwater Flood Incident (Other Records)

Increased Potential for Elevated Groundwater in

- Permeable Superficial Deposits
- Consolidated Aquifers

Notes

1. The increased Potential for Elevated Groundwater map shows those areas within the London Boroughs where there is an increased potential for groundwater to rise sufficiently to interact with the ground surface or be within 2 m of the ground surface. Such groundwater rise could lead to the following consequences:
   - flooding of basements of buildings below ground level;
   - flooding of buried services or other assets below ground level;
   - inundation of farmland, roads, commercial, residential and amenity areas;
   - flooding of ground floors of buildings above ground level; and
   - overflowing of sewers and drains.
2. Incident records shown are generally unconfirmed and may include issues such as water main bursts or non-groundwater related problems.
3. Areas not shown to have increased potential for elevated groundwater should be considered to have a low potential for elevated groundwater – Lack of information does not imply 'no potential' of elevated groundwater in that area.
4. Includes groundwater flood mapping provided by JBA Consulting Copyright © Jeremy Benn Associates Limited 2008 - 2011, partially derived from data supplied by the Environment Agency

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HILLINGDON LONDON

Surface Water Management Plan

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Scale at A3	Date	Drawn by	Approved by
1:40,000	05/04/2011	R.MOORE	P.HLINOVSKY

Increased Potential for Elevated Groundwater Map

Consultants
CAPITA SYMONDS Scott Wilson
Flood Risk Management
Capita Symonds
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52 Grosvenor Gardens,
Belgravia,
London
SW1W 0AU

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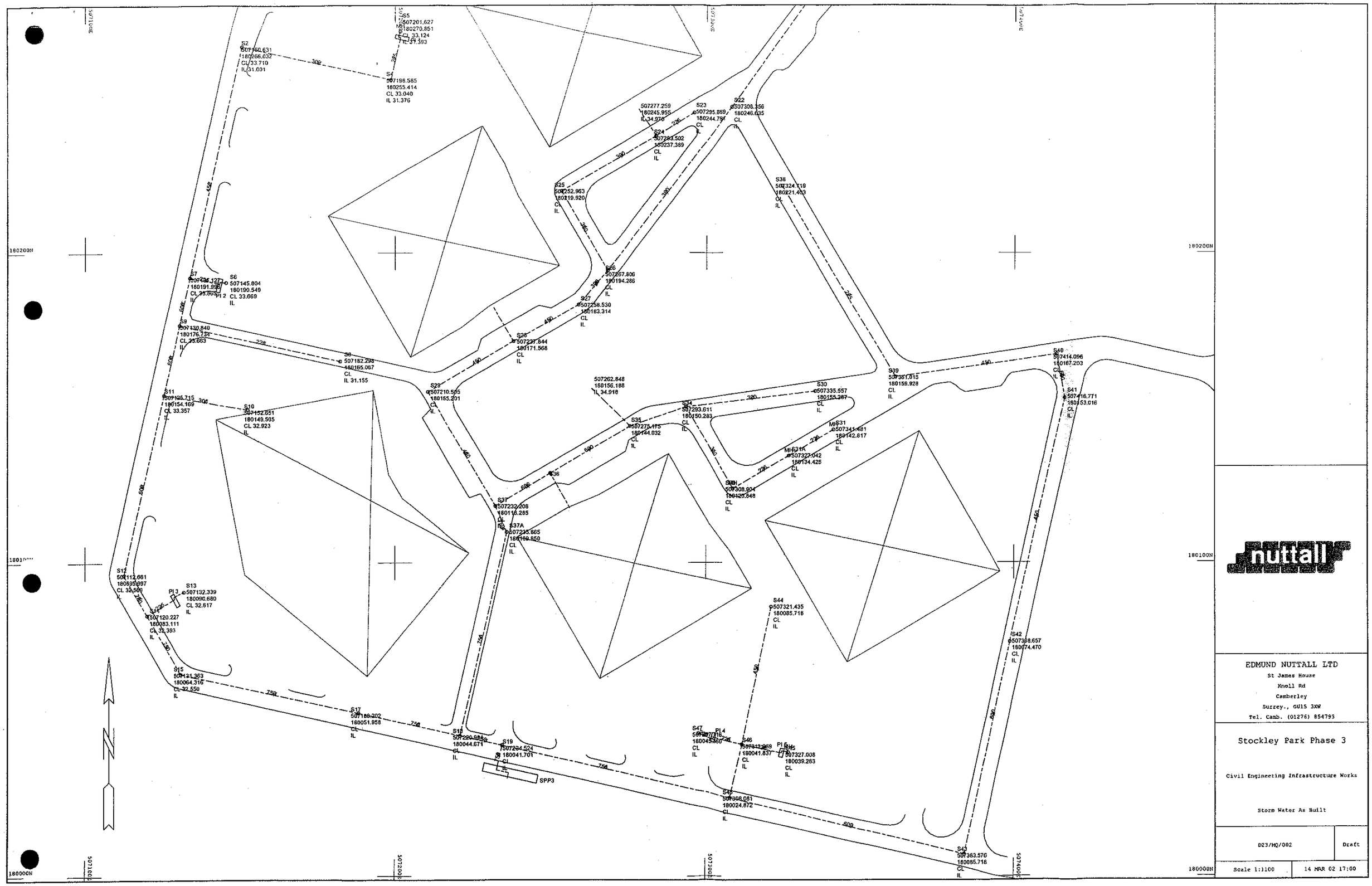
FIGURE 10.2

0 0.25 0.5 1 1.5 2 Kilometres

Filepath: L:\Environment\zwel\CS\046913_DrainLondon_Tier2\Group1\ARC\mxds\GP1_Hillingdon_Fig10.2_PotentialElevatedGWMap.mxd

Appendix G – Current On-Site Surface Water Drainage System

- Drawing No. D23/MQ/002 – Storm Water As Built (March 2002)
- Stormwater Foul and Telecom Manhole Schedule – For Construction (Nov 2000)
- Stormwater Canal Outfall – For Planning (July 2001)



EDMUND NUTTALL LTD
St James House
Knoll Rd
Camberley
Surrey., GU15 3XW
Tel. Camb. (01276) 854793

Stockley Park Phase 3

Civil Engineering Infrastructure Works

Storm Water As Built

D23/MQ/002	Draft
Scale 1:1100	14 MAR 02 17:00

A1

STORMWATER SCHEDULE

MANHOLE REFERENCE NUMBER	PLAN	EASTINGS (m)	NORTHINGS (m)	FINAL GL mAOD	MANHOLE INTERNAL DIAMETER (mm)	COVER TYPE	CLEAR OPENING (mm)	a DIA (mm)	a LL.	b DIA (mm)	b LL.	c DIA (mm)	c LL.	d DIA (mm)	d LL.
S1		507170.041	180313.895	34.005	1200	DI 2	600 x 600	225	31.482						
S2		507151.075	180266.450	33.748	1500	DI 2	600 x 600	450	31.000	225	31.225	300	31.150		
S3		507234.857	180219.242	33.936	1200	DI 10	600 dia	300	31.315	225	31.388	225	31.388		
S4		507198.668	180255.520	33.036	1200	DI 10	600 dia	300	31.315	225	31.388	225	31.388		
S5		507202.140	180210.865	33.110	1200	DI 6	600 x 600	225	31.380	225	31.380				
S6		507145.838	180189.731	33.616	1200	DI 6	600 x 600	225	31.260	225	31.260				
S7		507134.344	180192.325	33.939	1500	DI 2	600 x 600	600	31.724	450	30.874	225	31.696		
S8		507173.888	180166.880	35.133	1200	DI 4	600 x 600	225	31.164						
S9		507130.801	180176.826	33.722	1500	DI 2	600 x 500	600	30.697	600	30.697	225	31.672		
S10		507152.646	180149.503	32.931	1200	DI 6	600 x 500	300	31.500	300	31.500				
S11		507125.708	180154.069	33.411	1500	DI 2	600 x 600	600	30.858	600	30.858	300	30.958		
S12		507112.583	180095.963	32.832	1800	DI 2	600 x 600	750	30.409	600	30.559				
S13		507132.246	180090.187	32.821	1200	DI 6	600 x 600	225	31.400	225	31.400				
S14		507120.088	180083.075	32.442	1800	DI 6	600 x 600	750	30.384	750	30.384	225	30.909	225	30.909
S15		507131.078	180064.291	32.595	1800	DI 2	600 x 600	750	30.347	750	30.347				
S16		507190.531	180063.283	32.959	1200	DI 6	600 x 600	300	31.500	300	31.500				
S17		507188.620	180051.305	33.241	1800	DI 2	600 x 600	750	30.249	750	30.249	300	30.899		
S18		507220.713	180044.062	33.528	1800	DI 2	600 x 600	750	30.205	750	30.205	750	30.205		
S19		507234.342	180040.886	33.378	1800	DI 2	600 x 600	750	30.188	1ND DIAM	30.711	750	30.186	750	30.186
S20 (penstock)		507228.768	180016.263		1800	DI 10	1200 x 600	750	29.700	750	28.225				
S21		507341.240	180291.744	35.975	1200	DI 4	600 x 600	225	34.445						
S22		507307.977	180246.289	35.581	1200	DI 4	600 x 600	300	34.008	225	34.163				
S23		507294.462	180244.833	36.123	1200	DI 6	600 x 600	225	34.105						
S24		507262.734	180237.171	36.013	1200	DI 8	600 x 600	300	33.998	225	34.073	225	34.073		
S25		507252.852	180219.687	36.191	1200	DI 8	600 x 600	300	33.916	300	33.916				
S26		507267.712	180194.290	36.195	1200	DI 8	600 x 600	300	33.848	300	33.848	300	33.818	150	33.968
S27		507258.272	180182.107	36.094	1350	DI 8	600 x 600	450	33.609	300	33.759				
S28		507237.975	180171.457	36.068	1350	DI 8	600 x 600	450	33.516	450	33.516	225	33.741	150	33.741
S29		507219.434	180155.925	36.150	1350	DI 8	600 x 600	450	33.464	450	33.464				
S30		507335.831	180136.407	35.605	1200	DI 8	600 x 600	300	34.100						
S31		507341.498	180142.888	35.889	1200	DI 8	600 x 600	225	34.075						
S32		507328.774	180132.941	35.982	1200	DI 8	600 x 600	300	33.912	225	34.047				
S33		507308.534	180123.833	35.977	1200	DI 8	600 x 600	300	33.895	300	33.895				
S34		507293.814	180150.017	35.945	1500	DI 8	600 x 600	600	33.797	300	34.097	150	34.247	300	34.097
S35		507275.077	180143.870	36.050	1500	DI 8	600 x 600	600	33.629	600	33.629				
S36		507249.348	180128.817	36.046	1500	DI 8	600 x 600	600	33.335	600	33.335	150	33.785	225	33.710
S37		507232.209	180118.570	36.177	1800	DI 8	600 x 600	750	33.052	600	33.202	450	33.352		
S37A		507235.584	180110.000	36.062	1800	DI 8	600 x 600	750	33.034	750	33.034				
S38		507324.621	180221.498	35.880	1200	DI 4	600 x 600	225	34.395						
S39		507360.667	180159.859	35.498	1350	DI 4	600 x 600	450	33.690	225	33.815				
S40		507414.074	180167.788	34.494	1350	DI 8	600 x 600	450	32.850	450	32.850				
S41		507416.328	180152.547	34.203	1350	DI 8	600 x 600	450	32.560	450	32.560				
S42		507398.631	180074.583	33.519	1500	DI 6	600 x 600	600	31.730	450	31.880				
S43		507383.374	180007.368	33.305	1500	DI 2	600 x 600	600	31.343			600	31.343		
S44		507321.808	180087.310	32.955	1350	DI 10	600 dia	450	30.756	225	30.881	225	30.981		
S45		507326.898	180035.529	32.480	1200	DI 6	600 x 600	225	31.400	225	31.400				
S46		507311.588	180042.073	32.344	1500	DI 10	600 dia	600	30.654	450	30.804	225	31.029	225	31.029
S47		507297.544	180045.222	32.482	1200	DI 6	600 x 600	225	31.400	225	31.400				
S48		507307.823	180024.459	32.211	1800	DI 2	600 x 600	750	30.474	600	30.924	600	30.624		

NOTE: ALL COORDINATES ARE FOR THE INTERSECTION OF PIPES
ALL COVER AS GLYNWED OR SIMILAR APPROVED

FOUL DRAINAGE SCHEDULE

MANHOLE REFERENCE NUMBER	PLAN	EASTINGS (m)	NORTHINGS (m)	FINAL GL mAOD	MANHOLE INTERNAL DIAMETER (mm)	COVER TYPE	CLEAR OPENING (mm)	a DIA (mm)	a LL.	b DIA (mm)	b LL.	c DIA (mm)	c LL.	d DIA (mm)	d LL.
F4		507229.113	180263.020	32.974	1200 diam	DI 6	600 x 600	150	31.175	150	31.175				
F5		507224.618	180253.228	33.019	1200 diam	DI 6	600 x 600	150	31.115	150	31.140				
F6		507214.833	180256.058	32.852	1200 diam	DI 10	600 dia	225	30.945	150	31.020	150	31.020	150	31.020
F7		507181.227	180263.708	33.147	1200 diam	DI 10	600 dia	225	30.619	225	30.619	150	30.694		
F8		507149.690	180270.992	33.635	1200 diam	DI 2	600 x 600	225	30.293	225	30.293				
F9		507132.935	180196.554	33.998	1200 diam	DI 2	600 x 600	225	29.583	225	29.583				
F10		507121.677	180146.806	33.301	1200 diam	DI 2	600 x 600	225	29.083	225	29.083				
F11		507111.158	180100.188	32.658	1200 diam	DI 2	600 x 600	225	28.605	225	28.605				
F12		507111.894	180094.171	32.573	1200 diam	DI 2	600 x 600	225	28.327	225	28.327	225	28.327		
F13		507150.187	180100.481	32.950	1200 diam	DI 6	600 x 600	150	31.465	150	31.465				
F14		507129.909	180092.797	32.581	1200 diam	DI 6	600 x 600	150	30.020	150	30.020	150	30.020		
F15		507114.978	180087.138	32.465	1200 diam	DI 2	600 x 600	225	28.940	225	28.940				
F16		507251.819	180152.065	36.118	1200 diam	DI 10	600 x 600	150	34.790						
F17		507219.222	180133.015	36.177	1200 diam	DI 10	900 x 600	150	34.510	150	34.510				
F18		507233.419	180108.750	36.056	1200 diam	DI 10	600 x 600	150	33.788	150	33.788				
F19		507335.846	180084.486	33.011	1200 diam	DI 6	600 x 600	150	31.700	150	31.700				
F20		507298.245	180080.684	32.953	1200 diam	DI 6	600 x 600	150	31.700	150	31.700	150	31.700		
F21		507322.837	180073.901	32.805	1200 diam	DI 10	600 dia	225	31.500	150	31.580	150	31.580		
F22		507319.504	180058.601	32.632	1200 diam	DI 10	600 dia	225	30.787	225	30.787	150	30.862		
F23		507311.173	180021.775	32.211	1200 diam	DI 2	600 x 600	225	30.408	225	30.408				
F24		507253.856	180034.718	33.059	1200 diam	DI 2	600 x 600	225	29.806	225	29.806				
F25		507218.502	180042.588	33.518	1200 diam	DI 2	600 x 600	225	29.441	225	29.441	150	31.240	PIPE C	BACKDROP
F26		507181.694	180050.997	33.156	1200 diam	DI 2	600 x 600	225	29.066	225	29.066				
F27		507124.649	180063.671	32.629	1200 diam	DI 6	600 x 600	225	28.481	225	28.481				
F28		507107.506	180092.410	32.882	1200 diam	DI 6	600 x 600	225	28.147	225	28.147	225	28.147		
F29		507103.486	180099.452	32.800	1200 diam	DI 6	600 x 600	225	28.065	225	28.065				
F30		507101.446	180102.982		1200 diam	DI 6	600 x 600	225	28.017	225	28.017				
F31		507100.971	180103.541		1200 diam	DI 6	600 x 600	225	27.909	225	27.909				
F40 DISCH. CHAMBER		507149.930	180220.693		1350 diam	DI 10	600 dia	146 ID	31.260	225	31.360				

NOTE: ALL COORDINATES ARE FOR THE INTERSECTION OF PIPES
ALL COVER AS GLYNWED OR SIMILAR APPROVED

FOUL PUMP STATION SCHEDULE

CHAMBER	PUMP OUTLET AND DISCHARGE	COVER TYPE	CLEAR OPENING (mm)
MAIN FOUL PUMPSTATION VALVE CHAMBER	146mm ø ID RISING MAIN	D400 HEAVY DUTY COVER RECESSED, LOCKABLE, DOUBLE SEAL, GRP SAFETY GRID	1840 x 2140
MAIN FOUL PUMPSTATION WET WELL	225 mm INLET	D400 HEAVY DUTY COVER RECESSED, LOCKABLE, DOUBLE SEAL, GRP SAFETY GRID	1520 x 750

NOTE: FOR SETTING OUT INFORMATION REFER TO DRAWING 0202-XO-G-DR-2401
ALL COVER AS NORINCO OR SIMILAR APPROVED

PETROL INTERCEPTOR SCHEDULE

PETROL INTERCEPTOR	LOCATION	PRODUCT CODE	PLAN	CENTRE OF INTERCEPTOR (C) EASTINGS (m)	CENTRE OF INTERCEPTOR (C) NORTHINGS (m)	INLET DIA (mm)	INLET I.L.	OUTLET DIA (mm)	OUTLET I.L.	DIAMETER (mm)	LENGTH (mm)	INLET/ OUTLET CONFIGURATION	COVER TYPE
PI 1	PLOT 1	NSB10S/21		507201.698	180268.915	225	31.380	225	31.330	1200	3957	A – E	DI 6
PI 2	PLOT 2	NSB10S/21		507143.790	180190.193	225	31.260	225	31.210	1200	3957	A – E	DI 6
PI 3	PLOT 3	NSB10S/21		507129.277	180088.451	225	31.400	225	31.350	1200	3957	A – E	DI 6
PI 4	PLOT 4	NSB7.5S/21		507302.619	180044.100	225	31.400	225	31.350	1200	3007	A – E	DI 6
PI 5	PLOT 5	NSB7.5S/21		507324.860	180039.080	225	31.400	225	31.350	1200	3007	A – E	DI 6
SPP3	BETWEEN SITE AND CANAL	NSB200S/21 8no MAX FLOW		507238.800	180032.479	750	30.176	750	30.126	3000	15931	A – E	DI 10

NOTE: ALL COORDINATES ARE FOR THE CENTRE OF THE INTERCEPTOR
THE PETROL INTERCEPTORS SPECIFIED ARE CONDER, SIMILAR APPROVED WILL BE ACCEPTABLE

KEY
+ SETTING OUT POINT

TELECOMMS CHAMBER SCHEDULE

CHAMBER NUMBER	CHAMBER TYPE	PLAN	EASTINGS (m)	NORTHINGS (m)	FINISHED G.L. mAOD	COVER TYPE
T1	2		507260.373	180276.108	33.140	DI 5
T2	2		507227.310	180307.416	33.172	DI 5
T3	1		507176.577	180305.975	33.822	DI 9
T3A	1		507158.274	180306.757	.	DI 9
T3B	1		507172.809	180299.728	33.795	DI 1
T4	1		507151.957	180253.401	34.082	DI 5
T5	2		507192.015	180244.821	33.479	DI 5
T6	2		507216.454	180208.541	33.160	DI 5
T7	1		507138.553	180194.006	33.879	DI 1
T8	1		507132.260	180158.123	33.498	DI 1
T8A	4		507133.531	180182.219	33.395	DI 5
T9	2		507161.589	180159.870	33.091	DI 5
T10	2		507161.188	180105.186	33.137	DI 5
T11	1		507126.274	180139.601	33.154	DI 9
T12	1		507125.456	180081.300	32.393	DI 9
T13	1		507171.869	180059.354	32.892	DI 9
T14	1		507233.434	180045.450	33.328	DI 1
T15	2		507236.610	180051.576	33.158	DI 5
T16	2		507269.121	180090.500	33.140	DI 5
T17	1		507286.530	180033.476	32.412	DI 9
T18	1		507325.506	180024.680	32.392	DI 1
T19	2		507333.167	180047.380	32.581	DI 5
T20	2		507349.385	180095.757	33.140	DI 5
T23	1		507434.828	179992.176	33.749	DI 1
T23A	1		507388.494	180004.500	33.349	DI 1
T24	1		507383.613	180008.428	.	DI 1
T25	2		507377.916	180059.085	33.168	DI 5
T26	2		507361.686	180102.800	33.140	DI 5
T27	1		507294.687	180024.119	32.365	DI 1
T28	2		507301.318	180053.851	32.565	DI 5
T29	2		507281.410	180097.429	33.140	DI 5
T30	1		507225.044	180039.701	33.459	DI 1
T31	1		507153.414	180053.610	32.917	DI 1
T32	2		507171.860	180077.322	32.898	DI 5
T32A	2		507175.805	180066.583	33.098	DI 5
T33	2		507184.129	180100.082	33.137	DI 5
T33A	1		507132.580	180068.569	32.563	DI 1
T33B	4		507131.367	180058.237	.	DI 9
T34	1		507112.510	180083.435	32.479	DI 1
T35	1		507118.987	180141.245	33.183	DI 1
T36	1		507127.731	180179.991	33.718	DI 1
T37	2		507164.556	180171.220	34.676	DI 9
T38	2		507204.293	180201.426	33.140	DI 5
T39	1		507142.024	180243.320	34.328	DI 1
T40	1		507151.985	180283.701	.	DI 1
T41	2		507195.384	180273.036	32.976	DI 5
T42	2		507248.501	180268.532	33.140	DI 5
T43	3		507208.201	180181.389	36.263	DI 7
T44	3		507217.792	180161.856	36.124	DI 7
T45	3		507249.378	180182.436	36.107	DI 7
T46	3		507245.433	180187.179	36.432	DI 11

CHAMBER NUMBER	CHAMBER TYPE	PLAN	EASTINGS (m)	NORTHINGS (m)	FINISHED G.L. mAOD	COVER TYPE
T47	3		507266.866	180166.512	35.991	DI 9
T48	3		507262.210	180160.606	36.224	DI 7
T49	3		507274.786	180210.462	36.391	DI 9
T50	3		507256.636	180256.314	36.453	DI 9
T51	3		507303.940	180245.111	36.078	DI 7
T51A	3		507299.490	180251.640	36.053	DI 11
T51B	3		507289.167	180239.845	35.925	DI 11
T51C	3		507318.828	180246.580	35.608	DI 9
T52	3		507313.030	180259.849	35.908	DI 9
T53	3		507321.178	180252.771	35.408	DI 9
T54	3		507329.549	180220.232	35.825	DI 3
T55	3		507322.636	180216.130	35.242	DI 9
T55A	4		507326.739	180212.541	35.591	DI 9
T56	3		507338.545	180205.026	35.941	DI 3
T56A	3		507344.872	180194.212	35.861	DI 3
T56B	4		507347.997	180196.040	35.349	DI 9
T57	3		507358.744	180170.502	35.424	DI 3
T58	3		507351.734	180165.401	35.424	DI 9
T58A	3		507361.949	180149.934	35.626	DI 11
T59	3		507376.503	180164.657	35.041	DI 3
T60	3		507420.779	180171.206	34.338	DI 3
T61	3		507377.571	180157.435	35.087	DI 11
T62	3		507403.967	180165.555	33.744	DI 7
T62A	3		507394.643	180063.342	33.374	DI 7
T62B	1		507405.185	180060.992	.	DI 9
T64	3		507311.592	180147.677	35.897	DI 9
T65	3		507324.919	180119.654	36.412	DI 9
T66	3		507288.115	180146.181	36.066	DI 7
T67	3		507273.005	180158.962	36.101	DI 7
T68	3		507270.068	180144.584	35.938	DI 9
T69	3		507277.322	180132.580	36.463	DI 9
T70	3		507291.638	180126.459	35.995	DI 7
T71	3		507226.071	180123.202	36.162	DI 7
T72	3		507230.297	180104.928	36.128	DI 11
T73	3		507217.289	180150.984	35.963	DI 7
T74	3		507332.796	180285.283	35.978	DI 11
T75	3		507344.565	180282.407	35.419	DI 11
T76	3		507388.809	180171.275	34.319	DI 9
T77	3		507401.380	180160.683	34.623	DI 11
T78	3		507413.438	180155.211	34.215	DI 11
T79	3		507423.253	180153.275	.	DI 11
T80	3		507432.815	180162.441	.	DI 9
T81	3		507435.188	180172.812	.	DI 9
T82	3		507465.542	180150.076	.	DI 9
T83	3		507469.196	180170.077	.	DI 3
T84	3		507432.507	179998.503	.	DI 9
T85	3		507434.295	179998.059	.	DI 9
T86	3		507391.175	180013.239	.	DI 9
T87	3		507380.454	180015.446	33.255	DI 9
T88	3		507377.869	180003.060	.	DI 9

NOTES: TELECOMS CHAMBER SCHEDULE
A) SEE DRAWING 2810 AND 2811 FOR STANDARD COMMS DETAILS
B) ALL COVERS TO BE LOCKABLE
C) ALL COORDINATES ARE FOR THE CENTRE OF CHAMBER
D) FOR CLEAR OPENING SEE STANDARD DETAILS. THIS MAY BE INCREASED TO SUIT COVER AND FRAME DIMENSIONS, BUT SHALL NOT BE REDUCED BY MORE THAN 100mm.
E) TYPE 3 CHAMBERS IN BUS ROUTES SHALL BE COMPLETELY SURROUNDED WITH 150 C20 MASS CONCRETE.

COVER TYPES

PROJECT REFERENCE	BSEN 124 CLASS	TRAFFIC INTENSITY	SOLID OR RECESSED	LOCKING	PREFERRED SUPPLIERS
DI 1	D400	NORMAL	S	YES	NORINCO
DI 2	D400	NORMAL	S	NO	SAINT-GOBAIN
DI 3	D400	NORMAL	R	YES	NORINCO
DI 4	D400	NORMAL	R	NO	NORINCO
DI 5	C250	N/A	S	YES	NORINCO
DI 6	C250	N/A	S	NO	SAINT-GOBAIN
DI 7	C250	N/A	R	YES	NORINCO
DI 8	C250	N/A	R	NO	NORINCO
DI 9	B125	N/A	S	YES	NORINCO
DI 10	B125	N/A	S	NO	SAINT-GOBAIN
DI 11	B125	N/A	R	YES	NORINCO
DI 12	B125	N/A	R	NO	NORINCO

NOTES:
1. SUPPLIERS CONTACT DETAILS:
SAINT-GOBAIN PIPELINES, STANTON PAM PRODUCTS,
TEL: 01664 812812, FAX: 01664 812060
NORINCO UK, SELFLOCK LTD, MISTERTON, DONCASTER, SOUTH YORKSHIRE, DN10 4DN,
TEL: 01427 891491, FAX: 01427 891492

2. ALTERNATIVE SUPPLIER'S PRODUCTS MAY BE USED SUBJECT TO APPROVAL OF THE CLIENTS REPRESENTATIVE.

3. RECESSED COVERS FOR CLASSES B125 AND C250 SHALL HAVE STIFFENING WEBS THAT DO NOT EXTEND TO THE SURFACE.

FOUL DRAINAGE SCHEDULE – OFF SITE SEWER FOR ADOPTION

MANHOLE REFERENCE NUMBER	PLAN	EASTINGS (m)	NORTHINGS (m)	FINAL GL mAOD	MANHOLE INTERNAL DIAMETER (mm)	COVER TYPE	CLEAR OPENING (mm)	a DIA (mm)	a LL.	b DIA (mm)	b LL.
F1		507150.138	180327.535	33.400	1200 diam	DI 2 HEAVY DUTY, DOUBLE TRIANGULAR COVER LABELLED THAMES WATER	675 x 675	225	31.750	225	31.750
F2		507116.594	180339.511	32.720	1200 diam	DI 2 HEAVY DUTY, DOUBLE TRIANGULAR COVER LABELLED THAMES WATER	675 x 675	225	31.160	225	31.160
F3		507082.175	180330.741	32.250	1200 diam	DI 2 HEAVY DUTY, DOUBLE TRIANGULAR COVER LABELLED THAMES WATER	675 x 675	225	30.570	225	30.570
EXISTING MANHOLE IN HORTON ROAD		AS EXISTING (507055.316)	AS EXISTING (180309.285)	AS EXISTING	AS EXISTING	AS EXISTING	AS EXISTING	225	29.930	AS EXISTING	AS EXISTING

NOTE: ALL COORDINATES ARE FOR THE INTERSECTION OF PIPES
D OR SIMILAR APPROVED

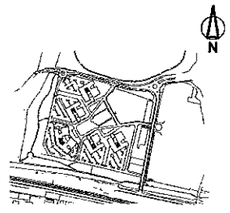
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM (mAOD).
3. ALL MANHOLE COVERS TO BE LOCKABLE WITH RECESS FOR FILLING UNLESS OTHERWISE STATED.

Rev.	Date	By	Description
6	13/09/04	JTC	AMENDED AS INDICATED
5	14/06/04	MC	AMENDED AS INDICATED
4	19/04/01	MC	COVER TYPES AMENDED, MINOR SETTING OUT AMENDMENTS
3	23/02/01	NA	CONSTRUCTION ISSUE
2	19/01/01	MC	FOUL PUMP STATION MANHOLE CHANGE
1	10.01.01	MC	TENDER ISSUE

Drawing Status
CONSTRUCTION

Key Plan



Job Title
STOCKLEY PARK
PHASE 3

Drawing Title
STORMWATER, FOUL AND TELECOM MANHOLES SCHEDULE

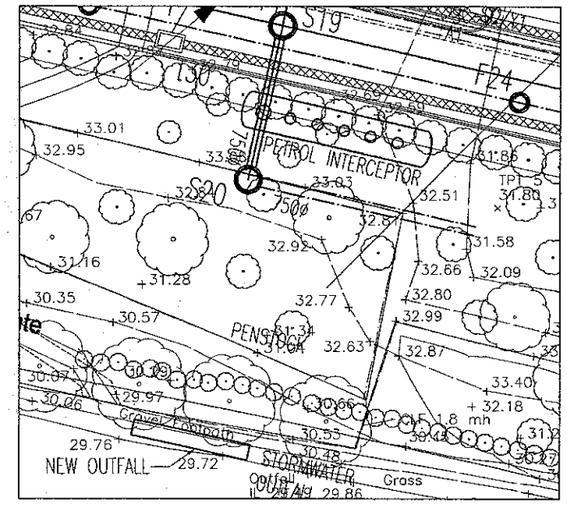
ARUP
Ove Arup & Partners ©
13 Fitzroy Street London W1P 6BQ
Tel: 020-7636 1531 Fax: 020-7580 3924

Scales: Originator: DMC
Checked: MC/NA Approved: PT Date: NOV 2000

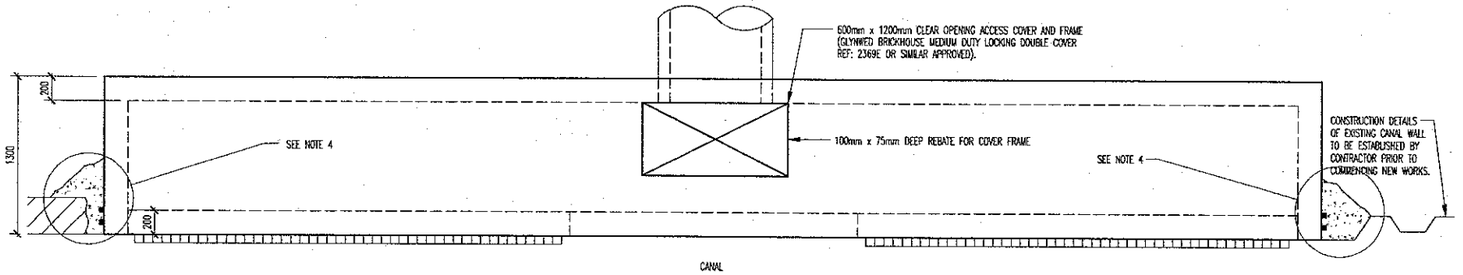
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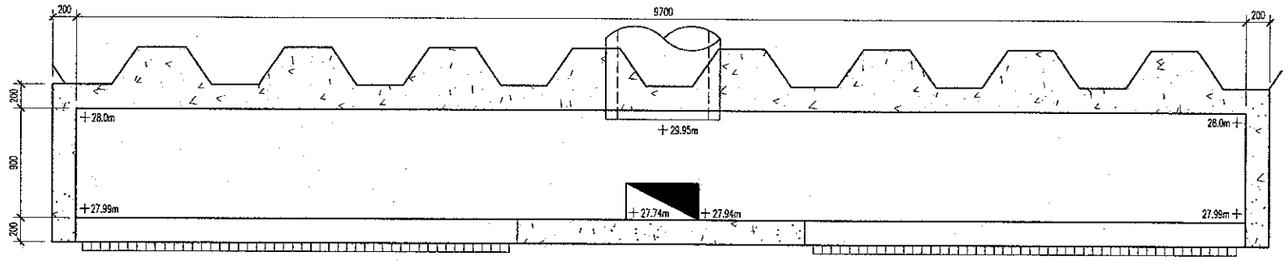
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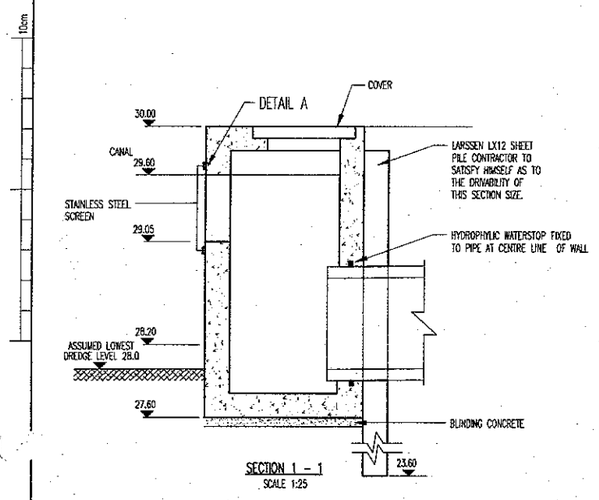
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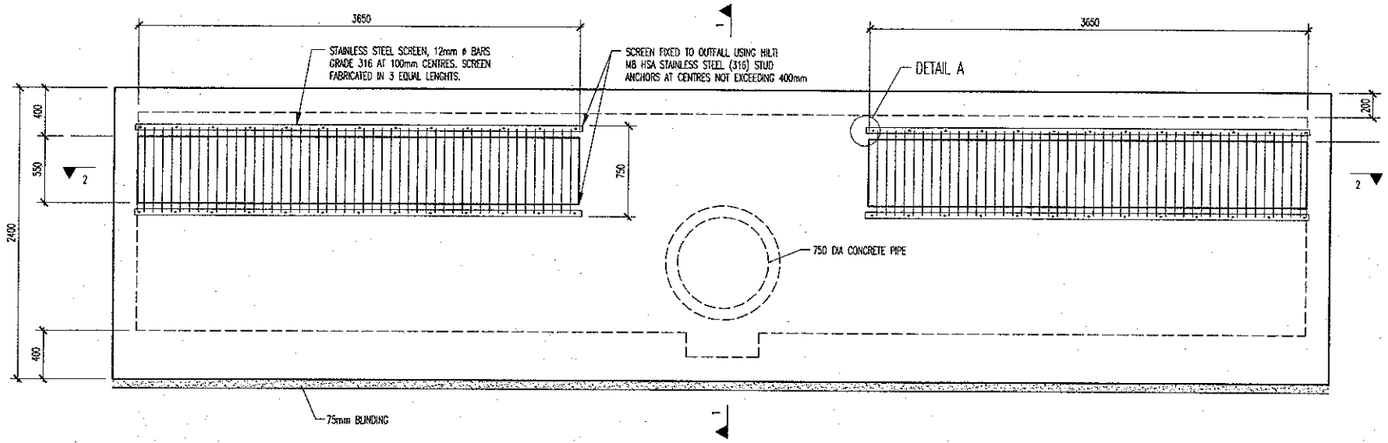
PLAN
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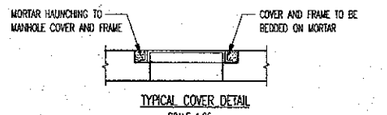
SECTION 2 - 2
SCALE 1:25



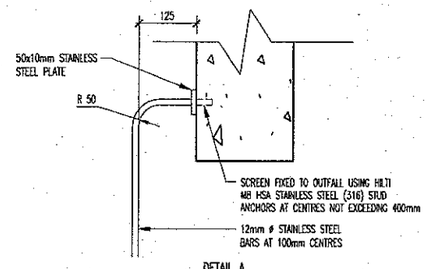
SECTION 1 - 1
SCALE 1:25



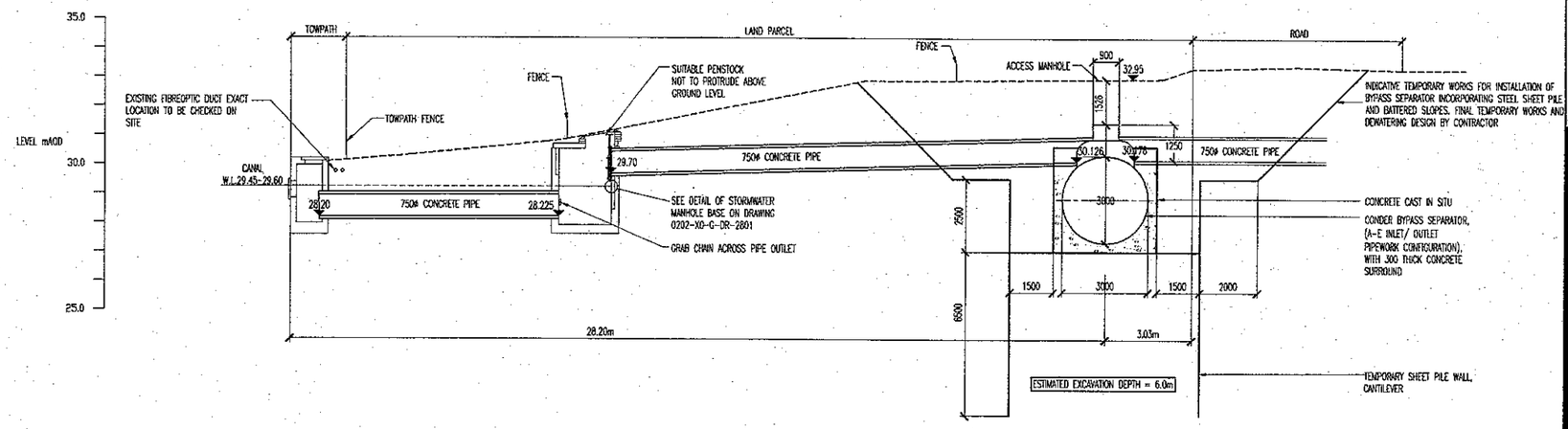
ELEVATION
SCALE 1:25



TYPICAL COVER DETAIL
SCALE 1:25



DETAIL A
NOT TO SCALE



CROSS SECTION THROUGH SPP3 PETROL INTERCEPTOR
SCALE 1:100

NOTES:

1. ALL LEVELS TO METRES ABOVE ORDNANCE DATUM (mAOD).
2. ALL DRAINAGE DETAILS ARE TO BE IN ACCORDANCE WITH SEWERS FOR ADOPTION, 4th EDITION.
3. CONTRACTOR TO AGREE ALL TEMPORARY WORKS WITH BRITISH WATERWAYS , AND TO ARRANGE ALL AGREEMENTS AND LICENCES FOR TEMPORARY WORKS.
4. FINAL DETAIL OF TIE IN, TO BE AGREED WITH THE CONSTRUCTION MANAGER ON SITE. PROVISIONALLY ALLOW FOR CLEANING EXISTING WALL FIX 2 LINES OF HYDROPHILIC WATER STOPS AND PLACE MASS CONCRETE PLUG.
5. SEE GEOTECHNICAL DETAILS OF GROUND CONDITIONS AND GROUNDWATER IN THE VICINITY OF THE OUTFALL.
6. CONTRACTOR SHALL SUBMIT ALL TEMPORARY WORK DRAWINGS AND METHOD STATEMENT TO THE SOUTHERN REGION OFFICE OF BRITISH WATERWAYS, COMPLY WITH CONTRACTOR REQUIREMENTS OF "CODE OF PRACTICE FOR WORKS AFFECTING BRITISH WATERWAYS" AND OBTAIN CONSENT FOR CONSTRUCTION OF THE WORKS.
7. CONCRETE GRADE C50 TO BS 5328, MIN CEMENT CONTENT 400kg PER m³, MAX WATER CEMENT RATIO 0.45. REINFORCEMENT STEEL GRADE 460, COVER 40mm, 1 TONNE PER 10m³

CONTRACTOR'S RESPONSIBILITIES INCLUDE THE FOLLOWING:-

A) AGREEING TEMPORARY WORKS WITH BRITISH WATERWAYS.

B) COMPLYING TO BRITISH WATERWAYS' CODE OF PRACTICE.

C) ENSURING DRIVEABILITY OF SHEET PILES.

D) SAFEGUARDING THE EXISTING OPTICAL FIBRE DUCTS IN TOWPATH.

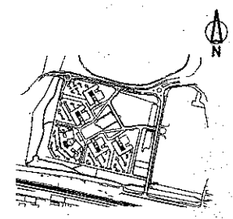
E) TOWPATH DIVERSION

F) ALL TEMPORARY WORKS.

Rev.	Date	By	Description
8	26/06/05	JTC	ISSUED FOR PLANNING
7	07/02/02	NA	MINOR AMENDMENTS
6	19/01/01	MC	NOTES ON CONTRACTOR'S RESPONSIBILITIES ADDED
5	10.01.01	MC	TENDER ISSUE
4	05/12/00	CJP	GENERAL AMENDMENTS
3	02/10/00	DMC	PENSTOCK ACCESS MANHOLE SIZE AMENDED
2	13/09/00	DMC	GRADIENT AND LEVEL OF PIPE
1	04/09/00	DMC	SHEME DESIGN REPORT ISSUE 2

Drawing Status
FOR PLANNING

Key Plan



Job Title
STOCKLEY PARK
PHASE 3

Drawing Title
STORMWATER CANAL OUTFALL

ARUP
Ove Arup & Partners©
13 Fitzroy Street London W1P 6BQ
Tel: 020-7636 1531 Fax: 020-7580 3924

Scales AS SHOWN | Designed DMC
Checked MC/NA | Approved PT | Date 07/02/01

Job No. 57376 | Drawing No. 0202-XO-G-DR- 2501 | Rev. 8

Appendix H - Drainage Calculations

- Drawing No. 6377-D-01

PHASE 1	
IMPERMEABLE AREA	3.59HA
REQUIRED STORAGE	2281m^3

PHASE 2	
IMPERMEABLE AREA	4.15HA
REQUIRED STORAGE	2637m^3

PHASE 1 STORAGE PROVISION	
NORTHERN CAR PARK	569m^3
SOUTHERN CAR PARK	1047m^3
LOADING BAY YARD	665m^3
TOTAL	2281m^3

RED LINE BOUNDARY

PHASE 2

PHASE 1

MAXIMUM NORTHERN BUILDING LINE

MAXIMUM SOUTHERN BUILDING LINE

MAXIMUM HEIGHT 16.5m

MAXIMUM AREA 25,500m²

POTENTIAL LOCATION OF ACCESS POINTS

2 STOREY OFFICES

2 STOREY OFFICES ABOVE GROUND

UNIT 1

UNIT 2

6 No DOCK LEVELLERS

9 No DOCK LEVELLERS

HORTON ROAD

GRAND UNION CANAL

Beeches Yard

Works

Warehouse

Lake

Pond

Barrie Works

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DO NOT SCALE

KEY:

- PHASE 1 BOUNDARY
- PHASE 2 BOUNDARY
- PIPE CONNECTION
- PETROL INTERCEPTION AND PENSTOCK
- FLAPPED OUTFALL
- PERMEABLE PAVING WITH GEOCELLULAR STORAGE
- SUB-SURFACE GEOCELLULAR STORAGE TANK

REV	DATE	BY	DESCRIPTION	CHK	APD
A	24/02/15	MLE	FIRST ISSUE	RS	RS

DRAWING STATUS: FOR INFORMATION ONLY

WSP

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http://www.wspgroup.com

CLIENT:

ARCHITECT:

PROJECT: PROLOGIS PARK, WEST LONDON

TITLE: INDICATIVE DRAINAGE STRATEGY

SCALE @ A3:	CHECKED:	APPROVED:
1:2000	RS	RS
CAD FILE:	DESIGN-DRAWN:	DATE:
6377-D-01	MLE	February 2015
PROJECT No:	DRAWING No:	REV:
70006377	6377-D-01	A

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S:\70006377 - Stockley Park Phase 3\E Models and Drawings\Development\AUTOCAD\D Drainage\6377-D-01.dwg 26/02/2015 11:26:59 Eldridge, Max

ICP SUDS Mean Annual Flood

Input

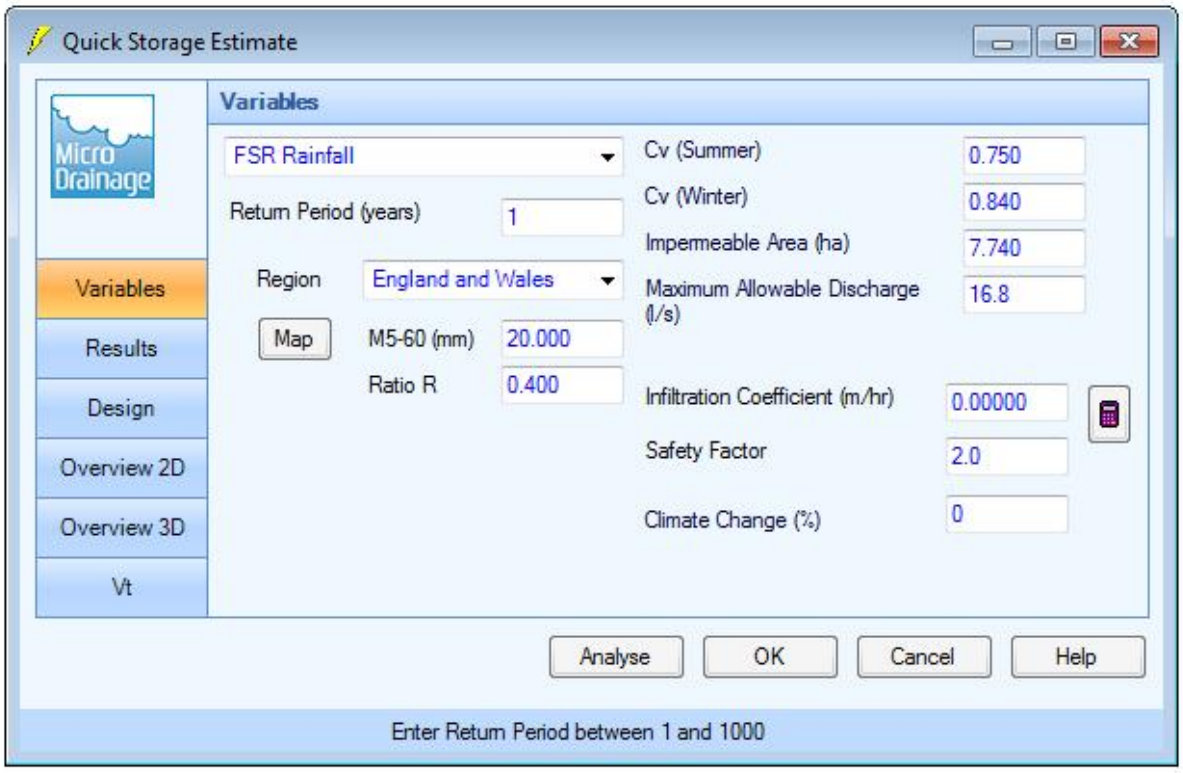
Return Period (years)	100	Soil	0.300
Area (ha)	1.000	Urban	0.000
SAAR (mm)	624	Region Number	Region 6

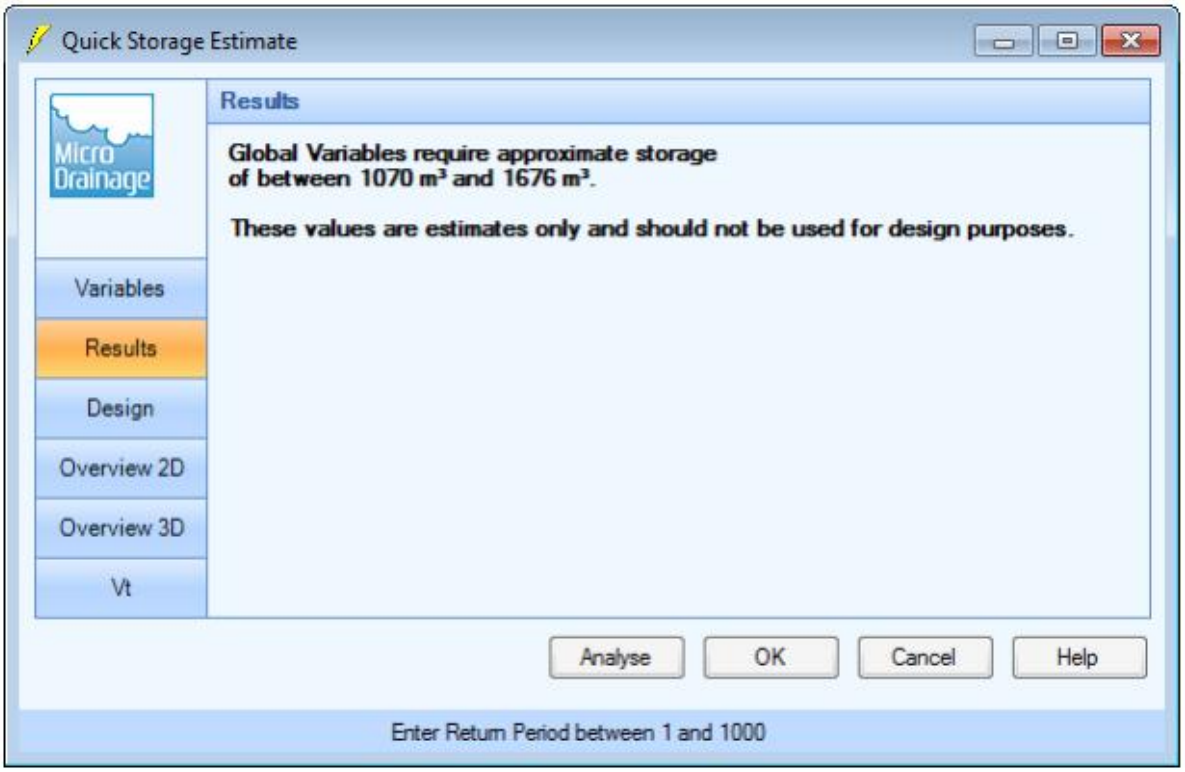
Results l/s

QBAR Rural	1.6
QBAR Urban	1.6
Q100 years	5.1
Q1 year	1.4
Q30 years	3.6
Q100 years	5.1

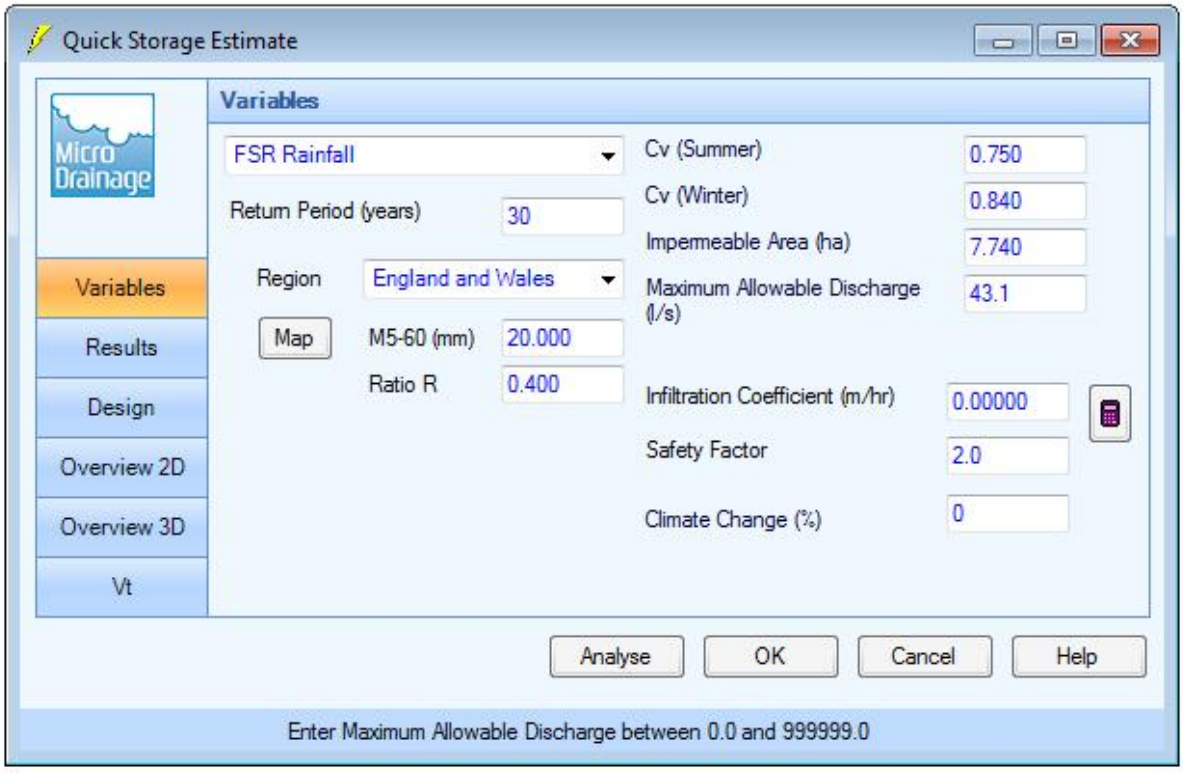
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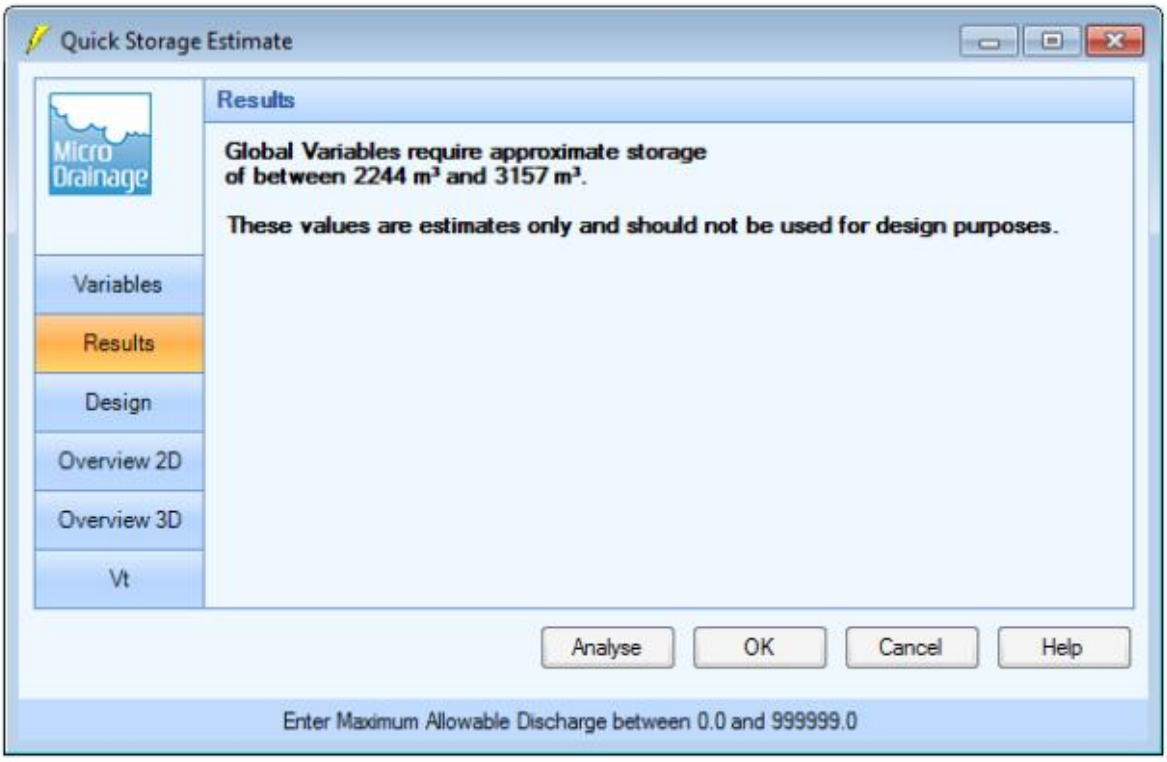
1:1yr rainfall event



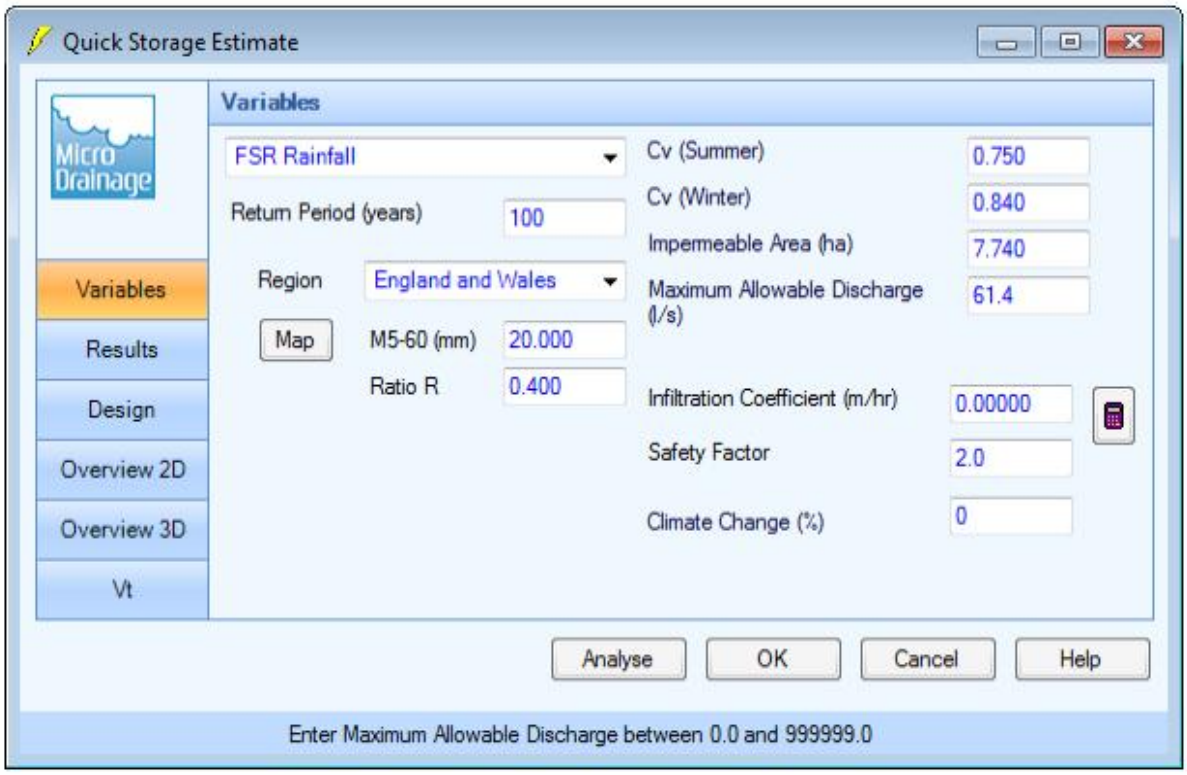


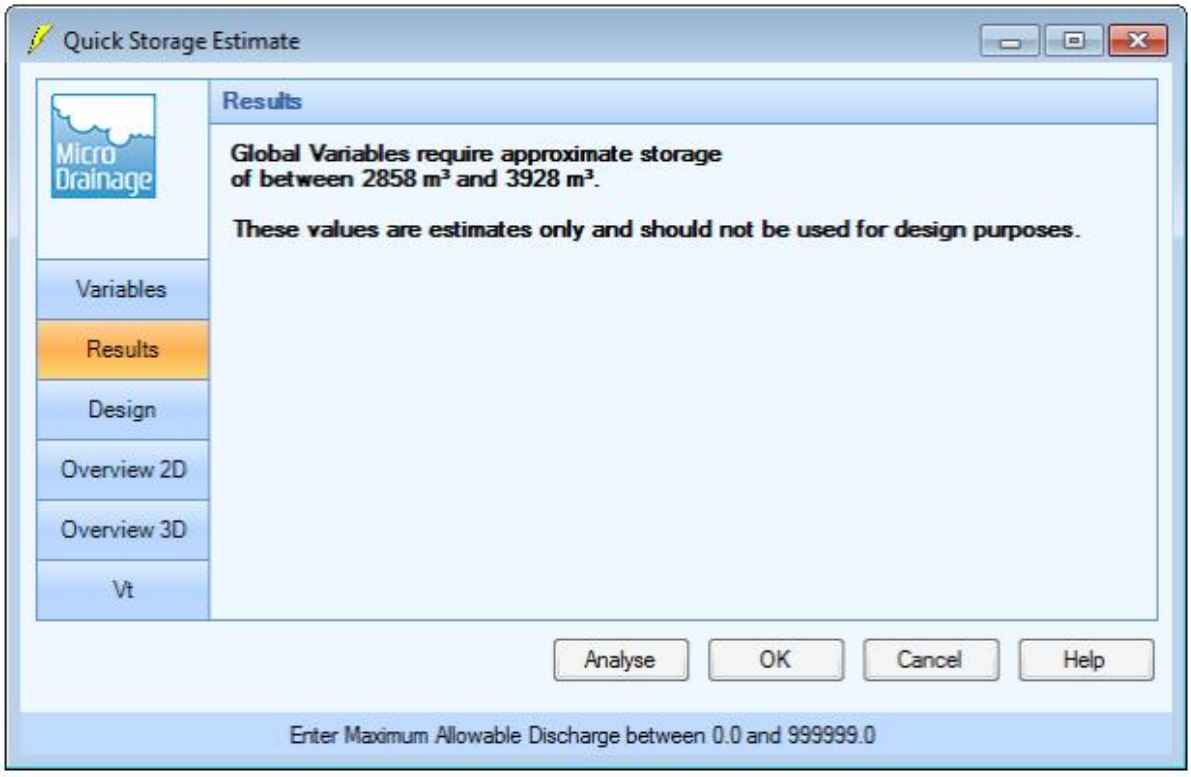
1:30yr rainfall event



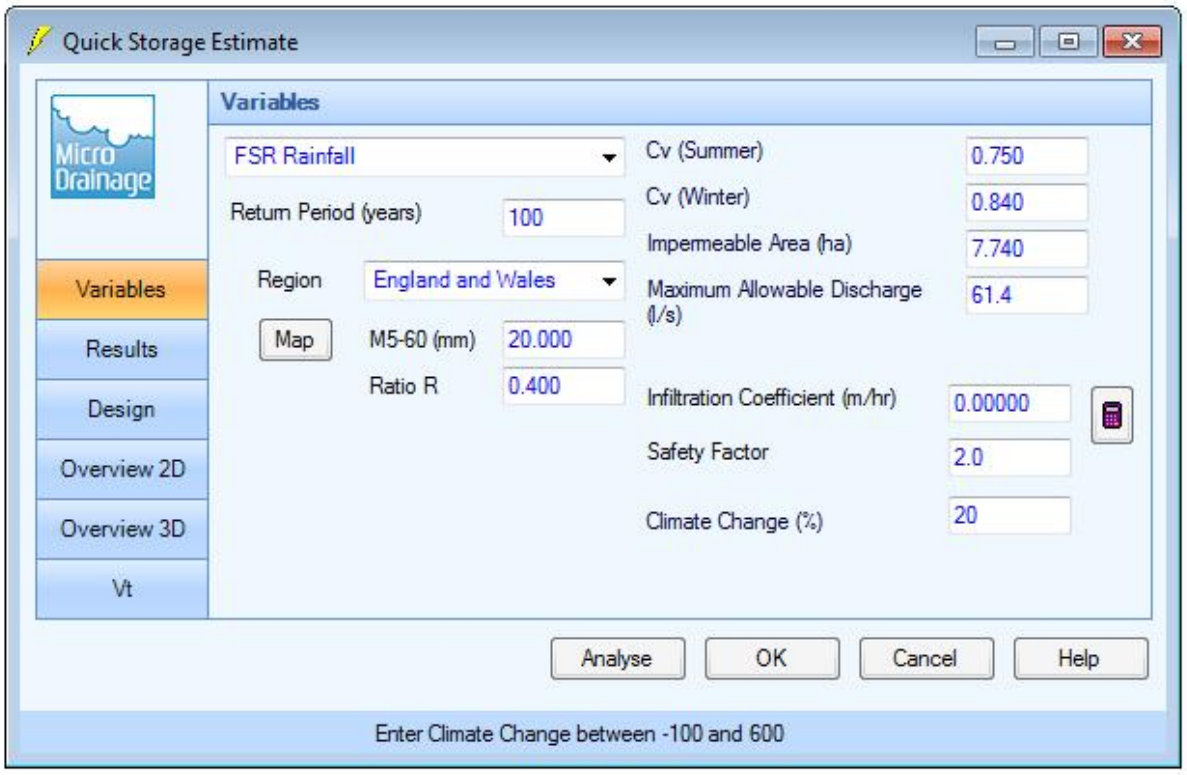


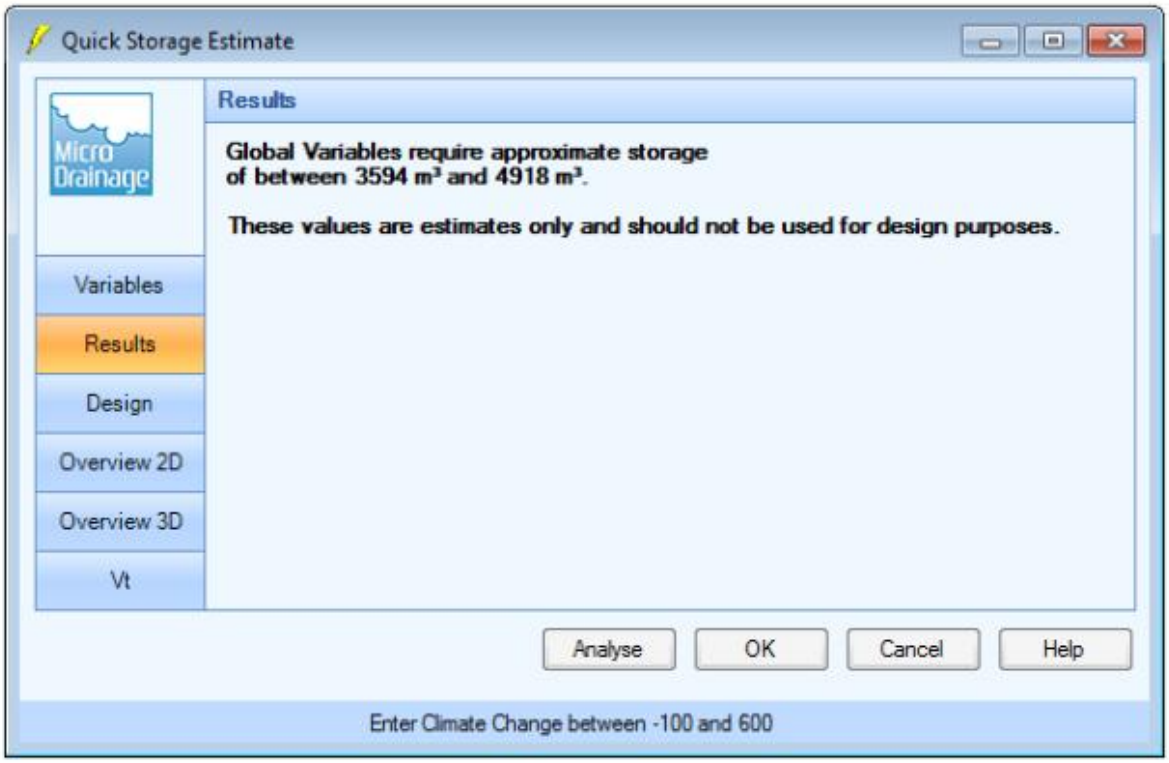
1:100yr rainfall event





1:100yr rainfall event with climate change





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