The O2 Centre Masterplan Phase 1 S73 Submission

Flood Risk Assessment Addendum

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Landsec

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Introduction

Pell Frischman have prepared this Flood Risk addendum on behalf of Landsec, to support a new Section 73 Application which seeks to vary planning permission ref. 2022/0528/P, granted on 20 December 2023, in respect of the O2 Masterplan Site (O2 Finchley Road, London) within the London Borough of Camden (LBC). Whilst the Section 73 Application will grant a new planning permission for the entire Site, amendments are only proposed to the Detailed Element. The Outline Elements will be unaffected by the proposed changes except for a reduction in the maximum residential floor area proposed.

This report serves as an addendum to the previously approved document submitted as part of the aforementioned planning application. The document reference is summarised below and included under Appendix A of this report.

- 104878-PEF-ZZ-ZZ-RP-D-100009-S4-P06 - Flood Risk Assessment

The Site is subdivided into 10 Development Plots (N1, N2, N3, N3-E, N4, N5, N6, N7, S1 and S8). These are identified on Parameter Plan ref. 19066_X_(02)_102. The 10 plots sit within three indicative phases.

The proposed Section 73 amendments relate to Development Plots N3E, N4 and N5, and the associated landscaping, access roads and infrastructure. These plots are located in the centre of the Site and are approved in detail as they form the first phase of the development – the “Detailed Element”. The Detailed Element of the Site extends to 1.79 ha.

Development Plots S8, N7 and N6 located in the west of the Site are approved in outline and form “Outline Element West”. Development Plots N3, N2, N1 and S1 located in the east of the Site are approved in outline and form “Outline Element East”. These plots together are referred to as the “Outline Elements.” The Outline Elements are not affected by the amendments proposed as part of this Section 73 Application except for a reduction in the maximum residential floor area proposed.

The amendments proposed as part of this Section 73 Application are herein referred to as the “Proposed Development”.

In summary, the Section 73 design amendments relate principally to the Detailed Element and involve adjustments to the height, massing and footprints of the buildings; the replacement of Block N4D with a two storey community centre; new landscaping and additional public realm; revisions to architecture; and revisions to unit mix and internal layouts. Overall, there is an increase in floorspace of 5,766 sqm (GIA) for the Detailed Element compared with the Approved Scheme, an increase of 43 residential units, an increase in the size of the community centre and a slight reduction in commercial floorspace (-8sqm GIA). The affordable housing provision remains the same at 36% of the floorspace (GIA).

While there is an increase in the floorspace proposed in the Detailed Element, there is a corresponding reduction in floorspace in the Outline Elements such that overall, there is no change proposed to the total floorspace permitted for the O2 Masterplan as a whole, apart from an 8sqm (GIA) reduction in commercial floorspace from the Detailed Element.

The Proposed Description of development is as follows:

"Application under Section 73 of the Town and Country Planning Act 1990 (as amended) to vary Conditions I4 (Severability Condition), AD1 (Approved Drawings - Masterplan), AD2 (Approved Drawings - Reserved Matters), AD3 (Approved Drawings - Phase 1), RM1 (Parameter Plans and Development Specification), RM6 (Phasing Plan), RM11 (Reserved Matters – Access Statement), RM21 (Reserved Matters – Total floorspace), D20 (Photo-voltaic Cells), D21 (Phase 1 Long Stay Cycle Parking), D22 (Phase 2 Short Stay Cycle Parking), D24 (Phase 1 Disabled Car Parking), D26 (Phase 1 Fire Safety Implementation of Approved Measures), and M28 (Phase-Wide Lighting Strategy) and the removal of Conditions M6 (Enabling Works) and M7 (Major Utilities Infrastructure) of planning permission ref. 2022/0528/P dated 20 December 2023 for 'Detailed planning permission for Development Plots N3-E, N4, and N5 and Outline planning permission for Development Plots N1, N2, N3, N6, N7, S1 and S8, including demolition of all existing structures and associated works, and redevelopment to include residential development (Class C3), commercial, business and service uses (Class E), local community uses (Class F2), and Sui Generis leisure uses (including cinema and drinking establishments) together with all landscaping, public realm, cycle parking and disabled car parking, highway works and infrastructure within and associated with those Development Plots, in accordance with the Development Specification. For the avoidance of doubt, the Detailed and Outline planning permission are separate and severable for each of the Plots shown on plan P011 and the description of development on any decision notice issued pursuant to the application would reflect that', to allow for amendments to the Detailed Element (Plots N3-E, N4 and N5) including additional height, alterations to the design, massing and footprint of the buildings; the replacement of Block N4D with the relocated community centre; additional residential floorspace (and corresponding reduction in floorspace within Outline Elements); revisions to unit mix and internal layouts; additional community (Class F2) floorspace, reduction in retail (Class E,a) floorspace, reduction in professional services (Class E,c) floorspace, additional blue badge parking and cycle parking; revised landscaping and additional public realm; and associated works".

Full details and scope of the Section 73 Application are described in the submitted Planning Statement Addendum, prepared by Newmark and the Design and Access Statement prepared by GRID.

The following sections are provided to summarise how the conclusion of the Flood Risk report approved under planning permission reference ref. 2022/0528/P are not affected by this Section 73 Application.

Flood Risk Summary

A Flood Risk Assessment (FRA) was submitted and approved under planning permission ref. 2022/0528/P. A copy of the approved document is provided under Appendix A.

The proposals submitted under the S73 Application do not include any material changes in relation to the consideration of Flood Risk. As such, all sources of Flood Risk have been considered in line with the previous assessment.

The following sources of information have been updated since this FRA was prepared.

- National Planning Policy Framework (NPPF), December 2024
- Planning Practice Guidance (PPG), August 2022
- The London Borough of Camden Flood Risk Management Strategy, 2022

A summary of the planning policy documents was presented in Section 3 of the approved FRA. Since the previous revision paragraphs 159 to 169 of the NPPF have been replaced by paragraphs 170 to 182. The changes to NPPF do not impact the outcome of the approved FRA.

London Borough of Camden updated their Flood Risk Management Strategy (FRMS) in 2022 for the period 2022 to 2027. As with the previous version the FRMS provides further information regarding surface runoff, groundwater and sewer flooding and flood risk around the borough and the introduction of flood risk alleviation schemes including SuDS.

Camden Council is in the process of updating the Local Plan. The emerging Camden Local Plan is currently it its consultation stage. The Regulation 18 consultation took place in early 2024. Further consultation is anticipated in 2025, with adoption currently anticipated in Spring 2026. At this stage in the plan preparation process, the draft Local Plan policies carry limited weight. However, these will start to carry more weight as the plan moves towards adoption and so have been considered within the application documentation.

The key findings from the previously submitted Flood Risk Assessment have found to remain true, and there are no fundamental changes to the baseline flood risk data, level of assessment required or mitigation measures. These are summarized in the table below which include reference to the relevant section on the Flood Risk Assessment report 104878-PEF-ZZ-ZZ-RP-D-100009-S4-P06 (Refer Appendix A).

Sources of Flood Risk	Degree of Risk			Comments
	Significant	Moderate	Low	
Fluvial			X	Section 4.2: The site is located wholly within Flood Zone 1.
Coastal & Tidal			X	Section 4.3 The site is far removed from the coast and impact of tidal flood levels.
Groundwater			X	Section 4.4 Potential susceptibility to groundwater flooding across the borough.
Surface Water		X		Section 4.5 Centre and west of site at moderate risk of surface water flooding, with small areas of high risk present.
Sewers			X	Section 4.6 Limited network of public and private sewers on site linking to wider systems outside of site boundary.

Canals			X	Section 4.7 No canals within the vicinity of the site
Reservoirs & Waterbodies			X	Section 4.8 None present.

To summarise, the overall flood risk classification for the development remains the same as before.

Flood Risk Mitigation proposals and Conclusions of the FRA are presented in Section 5 and 6 of the FRA respectively. The proposed development changes do not result in any changes to either section.

Conclusion

Since the previous approved scheme, the National Planning Policy Framework (NPPF) and London Borough of Camden Flood Risk Management Strategy have been updated. However, these updates do not change the outcome of the assessment made in the approved scheme.

Mitigation of flood risk to any 3rd party remains a critical consideration for the proposed drainage strategy, which is presented in the proposed Sustainable Drainage Report.

The outcomes of the approved Flood Risk Assessment are not impacted by the proposed S73 proposals, with the overall risk to the proposed development remaining low.

Pell Frischmann

Appendix A – Approved Flood Risk Assessment

Pell Frischmann

O2 Finchley Road, London

Flood Risk Assessment

Report Ref.		**104878-PEF-ZZ-ZZ-RP-D-100009**				
File Path		**https://pellf.sharepoint.com/sites/104878/Shared Documents/General/01 - WIP/Documents/Drainage/Flood Risk/FRA/104878-PEF-ZZ-ZZ-RP-D-100009.docx**				
Suit	**Rev**	**Description**	**Date**	**Originator**	**Checker**	**Approver**
S4	P06	For planning	27/01/2022	T. Sturtridge	D. Allum-Rooney	M. Hitchens
Ref. reference. Rev revision. Suit suitability.						

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1 Introduction

1.1 Project Brief

1.1.1 This Flood Risk Assessment (FRA) has been prepared by Pell Frischmann on behalf of LS (Finchley Road) Limited ('the Applicant') in support of an application made in part detail and part outline ('the Application') for the demolition and redevelopment of land encompassing the O2 Centre and associated car park, Homebase store, car showrooms and Builder's merchant (the "Site") within the London Borough of Camden ("LBC").

1.1.2 Development plots N3-E, N4 and N5 and the associated landscaping, access roads and infrastructure form the detailed element of the Application which extents to 1.79ha and these proposals are referred to as the "Detailed Proposals".

1.1.3 The remainder of the Application (comprising Development Plots N1, N2, N3, N6, N7, S1 and S8) is submitted in outline and these proposals are together referred to as the "Outline Proposals".

1.1.4 The Detailed Proposals and Outline Proposals together are referred to as the "Proposed Development".

1.1.5 Full details and scope of the Applications are described in the submitted Planning Statement, prepared by Gerald Eve LLP.

1.1.6 This report aims to review available information and assess the flood risk posed to the site and proposed development from a range of sources, now and in the future. The FRA has been carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG), in respect of flood risk and coastal change.

1.1.7 To complete the Flood Risk Assessment, the following key stages of work have been undertaken:

- Collate desk-based information and undertake a review of publicly available flood risk information including Environment Agency mapping and local data, policy, and guidance
- Undertake a desktop review of other data that has been made available such as topographical surveys, utility plans and proposed development layout options.
- Consult relevant stakeholders to obtain further information on local risks and issues.
- Provide advice on appropriate flood risk mitigation measures for the proposed development.
- Completion of relevant Camden Flood SuDS Proforma and Camden SuDS Proforma in line with Council requirements.

1.2 Sources of Information

1.2.1 A review of relevant information and guidance from a range of sources has been undertaken and includes the following key documents;

- National Planning Policy Framework (NPPF), July 2021
- Planning Practice Guidance (PPG), June 2021
- Environment Agency Flood Map for Planning and Risk of Flooding from Surface Water datasets from the DEFRA Spatial Data Catalogue
- DEFRA MagicMap, 2021
- British Geological Survey Geology of Britain Viewer, 2021
- Camden Planning Guidance: Water and Flooding, March 2019
- London Borough of Camden Strategic Flood Risk Assessment, July 2014
- London Borough of Camden Preliminary Flood Risk Assessment, April 2011
- The London Borough of Camden Flood Risk Management Strategy, 2013
- Camden Local Plan, 2017

- London Borough of Camden Surface Water Management Plan, July 2011

2 Background & Site Context

2.1 Site Location & Existing Use

2.1.1 The site is located to the west of Finchley Road in the London Borough of Camden, and currently comprises the O2 centre, other retail units and associated car parking, access roads and service yards. It is situated east station. A site location plan is included for reference as **Figure 2.1**. In total, the total site boundary area covers approximately 5.79 hectares.

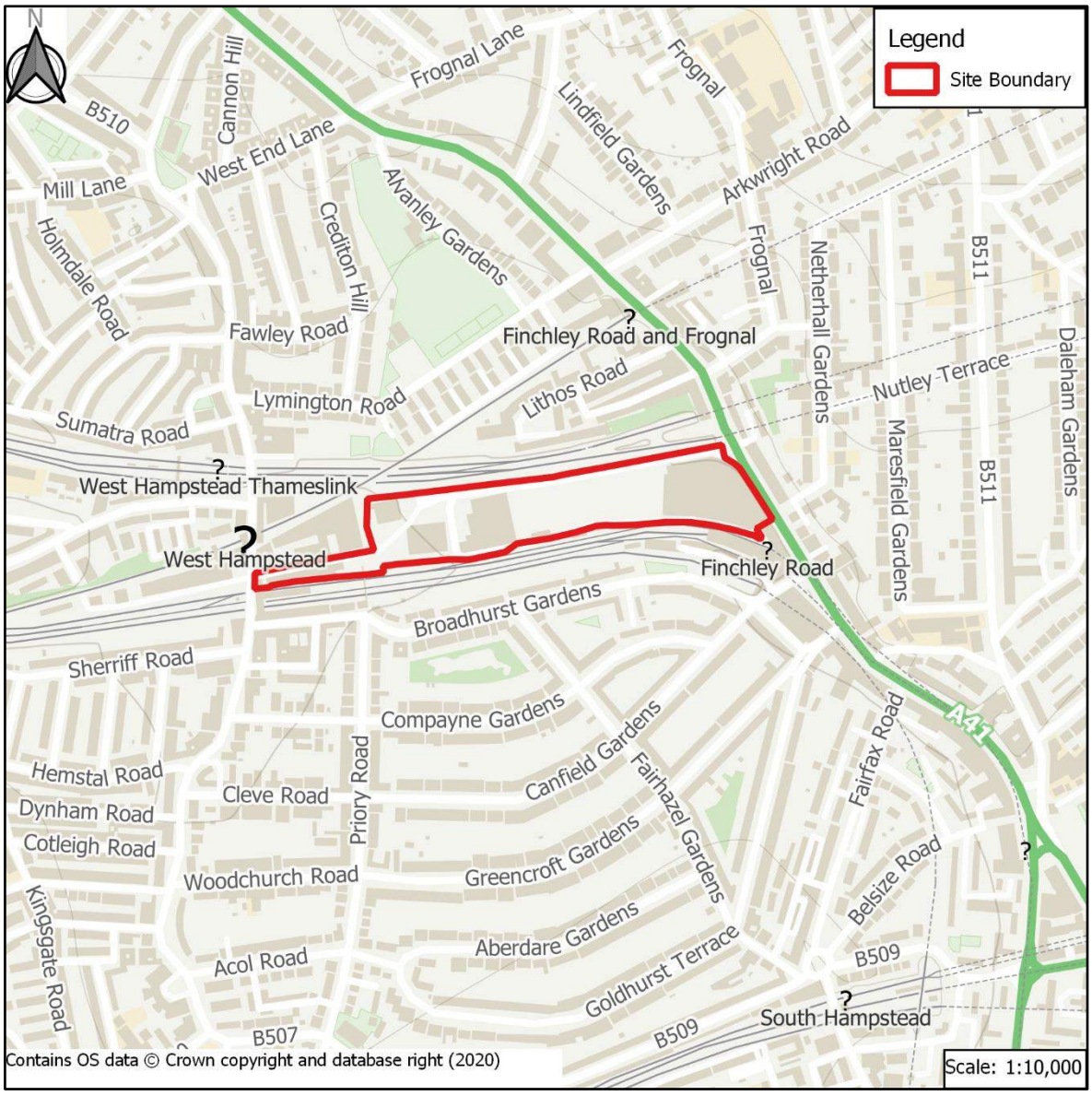


Figure 2.1 Site Location Map

2.1.2 The eastern boundary is formed by Finchley Road (A41), with railway links to the immediate north and south serving West Hampstead Thameslink and TfL stations. Generally speaking, the site is within a predominantly residential area with dwellings beyond the main transport infrastructure in all directions.

2.1.3 Mapping shows the site to be entirely covered with buildings and paved areas and therefore, it is considered brownfield in development terms, and will likely have existing drainage infrastructure serving the area.

2.2 Local Watercourses

2.2.1 The site has no open watercourses within its boundary. The OS OpenRivers dataset indicates the presence of a potentially culverted watercourse approximately 920m to the east of the site. A review of the information and wider mapping suggests that there may be a culverted section of watercourse from the southernmost pond in Hampstead Heath approximately 1.5km northeast of the site underneath The Serpentine in Hyde Park.

2.2.2 It is thought this is part of the historic River Tyburn that used to flow though London, now considered an historic 'Lost River' and in part forming sections of Thames Water's sewer network.

2.2.3 The River Westbourne was also thought to rise in Hampstead, flowing through Kirburn and Bayswater to the west of the site, again approaching The Serpentine in Hyde Park. It is understood the former river does not pass through the site.

2.2.4 **Figure 2.2** shows a plan of the local watercourses for context.

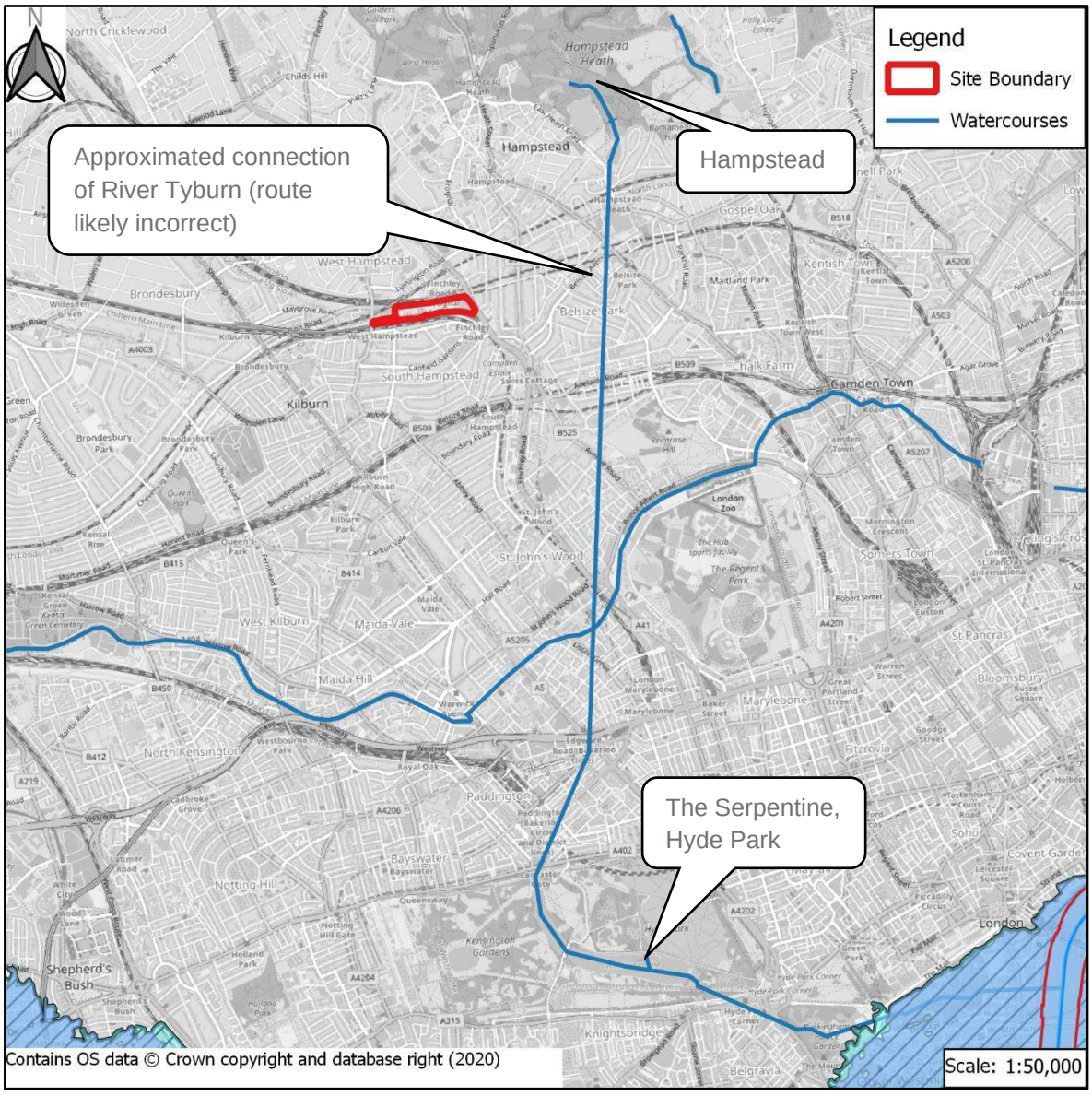


Figure 2.2 Watercourses Map

2.3 Topography

2.3.1 Topography across the site is relatively level, ranging from the lowest areas outside the western façade of the O2 Centre reported around 47.9m AOD to the western boundary where levels are approximately 50.0m AOD. Levels along Finchley Road are generally raised above the site, ranging from 56.5m AOD at the site entrance along Blackburn Road down to 54.1m AOD near the southeast corner of the site. A topographical survey of the site has been included in **Appendix A**.

2.4 Geology

2.4.1 British Geological Survey (BGS) mapping suggests the site has no recorded superficial geology across the site and the area surrounding the site.

2.4.2 The site is wholly underlain by a bedrock geology comprising London Clay Formation (clay, silt and sand).

2.4.3 A historic borehole from 1951 (BGS ref; TQ28SE516) drilled to a depth of 3.51m bgl to the south of the site confirms the bedrock to be clay heavy with medium to fine layers of gravel. Furthermore, no water was struck during the drilling, but was reported the following day that water levels were approximately 8ft from ground level.

2.4.4 Aquifer designations, as designated by DEFRA, for the underlying strata have recorded the superficial drift classification to be unproductive. The bedrock designation is also recorded as being unproductive.

2.5 Development Proposals

2.5.1 Proposals consists of part full and part outline planning permission comprising the following:

2.5.2 Detailed planning permission for Development Plots N3-E, N4, and N5 including demolition of existing above ground structures and associated works, and for residential development (Class C3) and commercial, business and service (Class E) uses in Development Plot N3-E, residential development (Class C3) and local community (Class F2) and commercial, business and service (Class E) uses in Development Plot N4, and residential development (Use Class C3) and commercial, business and service uses (Class E) uses in Development Plot N5 together with all landscaping, public realm, cycle parking and disabled car parking, highway works and infrastructure within and associated with those Development Plots.

2.5.3 Outline planning permission for Development Plots N1, N2, N3, N6, N7, S1 and S8 including the demolition of all existing structures and redevelopment to include residential development (Class C3) commercial, business and service uses (Class E), sui generis leisure uses (including cinema and drinking establishments) together with all landscaping, public realm, cycle parking and disabled car parking, highway works and infrastructure within and associated with those Development Plots. The Application is submitted in hybrid form – this means that (part of the application is made in detail and part is made in outline).

2.5.4 The Application site has been subdivided into 10 Development Plots (N3-E, N4 and N5 N1, N2, N3, N6, N7, S1 and S8).

2.5.5 The first three Development Plots (N3-E, N4 and N5), located in the centre of the Site, are submitted in detail, and form the first phase – “Detailed Phases”.

2.5.6 Development Plots S8, N7 and N6 located in the west of the Site are submitted in Outline and form the Second Phase - “Outline Phases West”.

2.5.7 Development Plots N3, N2, N1 and S1 located in the east of the Site are submitted in Outline and form the third Phase – “Outline Phases East”.

2.5.8 The Detailed Proposals will include a total of 55,180sq.m GIA of residential floorspace including an allowance for car parking. The Detailed Proposals will include approximately 608 dwellings.

2.5.9 The Outline Proposals will include up to 115,000sq. m GIA of residential floorspace including an allowance for car parking and basements.

2.5.10 Therefore, the total residential use across the Site, including residential parking in podiums could be up to 170,180sq. m GIA equivalent to approximately 1,800 residential units.

3 Policy Context

3.1 National Planning Policy Framework

3.1.1 The National Planning Policy Framework[1] (NPPF) was first published in 2012, with subsequent revision by the Ministry of Housing, Communities and Local Government appended in July 2018 and February 2019 with the most recent update made in July 2021.

3.1.2 The NPPF is the primary source of national planning guidance in England, setting out the Government's planning policies for England, and how they are expected to be applied by local councils.

3.1.3 'Chapter 14: Meeting the challenge of climate change, flooding and coastal change' outlines the guiding principles for managing flood risk as part of the planning process, notably paragraphs 159-169.

3.1.4 The Planning Practice Guidance[2] sets out the vulnerability to flooding of different land uses. It encourages development to be areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment.

3.1.5 The Planning Practice Guidance includes a series of tables that define Flood Zones, the flood risk vulnerability classification of development land uses, and 'compatibility' of development within the defined Flood Zones.

3.1.6 Therefore, this Flood Risk Assessment has been completed in line with the guidance and requirements of the NPPF and Planning Practice Guidance.

3.2 Local Plan Policies

3.2.1 The 'Camden Local Plan 2017[3]' was adopted in 2017 and sets out how land within the borough can be used and developed, providing policies which the council uses to determine application and regeneration activities.

3.2.2 The plan aims to oversee how the council will manage future growth, encourage sustainable development, and ensure changes are appropriate to local need now, and in the future.

3.2.3 More generally, the Local Plan 2017 lists policies that influence the design and principles of all development within the borough. Those relevant to this Flood Risk Assessment are as follows:

- Policy A1: Managing the impact of development
- Policy CC2: Adapting to climate change
- Policy CC3: Water and flooding

3.3 Local SFRA

3.3.1 The London Borough of Camden Strategic Flood Risk Assessment[4] was published in July 2014 in partnership with URS. The SFRA was prepared to provide an appropriate evidence base for the development, a summary of flood risk and to provide an assessment for the sequential test for suitability of development of allocated sites.

3.3.2 The SFRA also includes relevant background flooding data and a summary of flood risks within the borough.

[1] Ministry of Housing, Communities and Local Government (July 2021); *The National Planning Policy Framework*
[2] Ministry of Housing, Communities and Local Government (June 2021); *Planning Practice Guidance*
[3] London Borough of Camden (2017); *Camden Local Plan*; prepared by LBC
[4] London Borough of Camden (July 2014); *Strategic Flood Risk Assessment*; prepared by URS on behalf of LBC

3.4 Local PFRA

3.4.1 The London Borough of Camden Preliminary Flood Risk Assessment[5] was published in April 2011 in partnership with Halcrow Group Ltd. This PFRA was prepared to assist the London Borough of Camden meet their duties to manage local flood risk and deliver any legal requirements placed on them as the LLFA under the Flood Risk Regulations 2009.

3.4.2 The PFRA also identifies the past and future flood risk for the borough and includes an assessment of where within the borough flooding, including overland flow and direct rainfall, will occur and to what extent along with the number of properties at risk of flooding in the borough.

3.5 Local Flood Risk Management Strategy

3.5.1 The London Borough of Camden Flood Risk Management Strategy[6] was published in 2013. The FRMS was produced to comply with Section 9 of the Flood and Water Management Act 2010 and aims to provide a framework for meeting their requirements to develop, maintain, apply and monitor a local strategy for flood risk management.

3.5.2 The FRMS provides further information regarding surface runoff, groundwater and sewer flooding and flood risk around the borough and the introduction of flood risk alleviation schemes including SuDS.

3.6 Surface Water Management Plan

3.6.1 The London Borough of Camden Surface Water Management Plan[7] was published in July 2011 in partnership with Halcrow Group Ltd. The SWMP was produced to present the outputs of the London Borough of Camden and was used to inform the Local Flood Risk Management Strategy.

3.6.2 The SWMP further lays out the historical flooding and flood interactions between sources within the borough, also providing a risk assessment of surface water, ordinary watercourse, groundwater and sewer flooding among other influences, showing a summary of the risk the borough faces from those sources.

3.7 Camden Planning Guidance

3.7.1 The Water and Flooding Camden Planning Guidance[8] (WFCPG) was published in March 2019. The WFCPG was produced to support the policies within the Camden Local Plan 2017 in relation to flooding and water.

3.7.2 The WFCPG further provides supplementary planning guidance that developments will have to consider. This document relates to Local Plan Policy CC3: Water and Flooding and emphasises the importance of water efficiency, flood risk management and sustainable drainage.

[5] London Borough of Camden (April 2011); *Preliminary Flood Risk Assessment*; prepared by Halcrow Group Ltd on behalf of LBC
[6] London Borough of Camden (2013); *Flood Risk Management Strategy*; prepared by LBC
[7] London Borough of Camden (July 2011); *Surface Water Management Plan*; prepared by Halcrow Group Ltd on behalf of LBC
[8] London Borough of Camden (March 2019); *Water and Flooding Camden Planning Guidance*; prepared by LBC

4 Assessment of Flood Risk

4.1 Desk-Based Information

4.1.1 The NPPF states that all potential sources of flood risk must be identified and appraised. Flooding can occur from a variety of sources individually, or in combination and can result from both natural and artificial processes.

4.1.2 **Table 4.1** provides an initial desk-based review of the level of flood risk from all sources, which are then assessed in further details where the risk is considered significant and merits further investigation.

Table 4.1 Desk-Based Assessment of Flood Risk

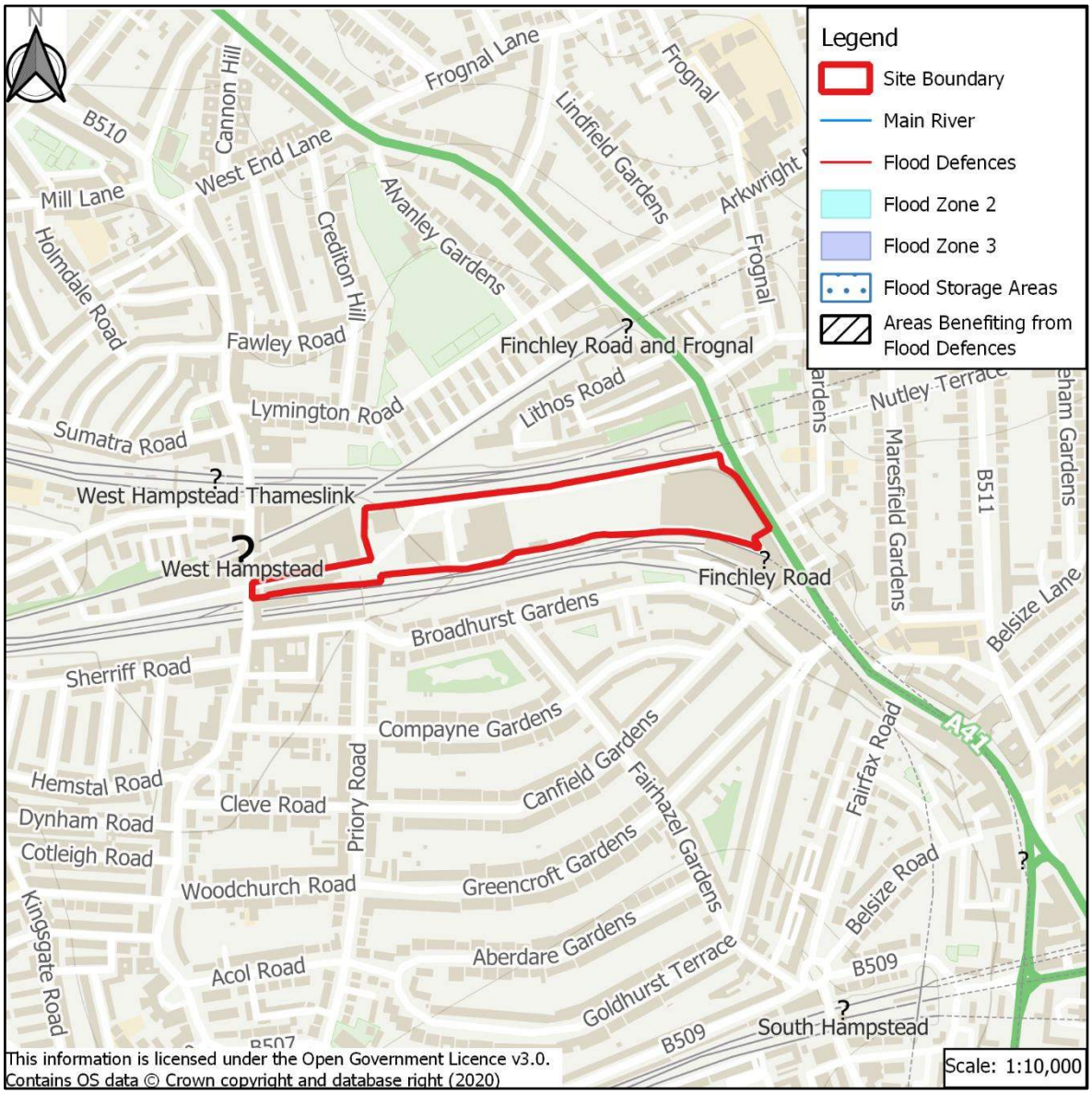
Sources of Flood Risk	Degree of Risk			Comments
	Significant	Moderate	Low	
Fluvial			X	The site is located wholly within Flood Zone 1.
Coastal & Tidal			X	The site is far removed from the coast and impact of tidal flood levels.
Groundwater			X	Potential susceptibility to groundwater flooding across the borough.
Surface Water		X		Centre and west of site at moderate risk of surface water flooding, with small areas of high risk present.
Sewers			X	Limited network of public and private sewers on site linking to wider systems outside of site boundary.
Canals			X	No canals within the vicinity of the site
Reservoirs & Waterbodies			X	None present.

4.2 Fluvial Flood Risk

4.2.1 The Environment Agency has produced a resource known as the Flood Map for Planning, which identifies areas at risk of flooding from Main Rivers and the sea. An extract of this mapping is included for reference as **Figure 4.1**.

4.2.2 The site is shown to be located wholly within Flood Zone 1 (Low Probability) which is defined in the Planning Practice Guidance as land having a less than 1 in 1,000 annual probability of river or sea flooding.

Figure 4.1 Flood Map for Planning



4.2.3 The closest Flood Zone extent is found approximately 4.5km to the west of the site associated with the River Brent and tributaries.

4.2.4 Due to the intervening topography (vast areas of residential development), distance from the site and considering the site is in Flood Zone 1 (Low Probability) with no anticipated flood risk from any ordinary watercourse, the risk of fluvial flooding is considered to be low.

4.3 Coastal & Tidal

4.3.1 The site is in Flood Zone 1, which includes the consideration of flooding from the sea and tidal influences and is considered to be far removed from tidal influences on the River Thames.

4.3.2 Therefore, the risk of flooding from Coastal or Tidal related flood events is considered to be low.

4.4 Groundwater

4.4.1 Groundwater flooding occurs when the water table rises above ground elevations. It is most likely to happen in low lying areas underlain by permeable geology. This may be regional scale chalk or

sandstone aquifers, or localised deposits of sands and gravels underlain by less permeable strata such as that in a river valley.

4.4.2 Historic boreholes in the area were dry when drilled, but recorded water rising to approximately 8m bgl the day after. The bedrock formation of London Clay is designated as unproductive strata, which are deposits that have low permeability and negligible significance for water supply or base river flow.

4.4.3 Furthermore, the borehole records show the London Clay bedrock is covered with various strata of mottled clay, sandy clay and soft to firm clays. This suggests the superficial deposits are unlikely to yield significant amounts of groundwater and restrict movement of groundwater within its layers.

4.4.4 The site is not within a source protection zone (SPZ) with the nearest zone located approximately 480m southeast of the site. Water abstraction takes place approximately 700m to the south and is not for potable water. Potable water extraction for Thames Water Utilities is recorded approximately 1.5km away from the site.

4.4.5 London Borough of Camden's SFRA shows no incidents of groundwater flooding within the site boundary, but records flooding to ~8 houses to the south of the site boundary around Canfield Gardens.

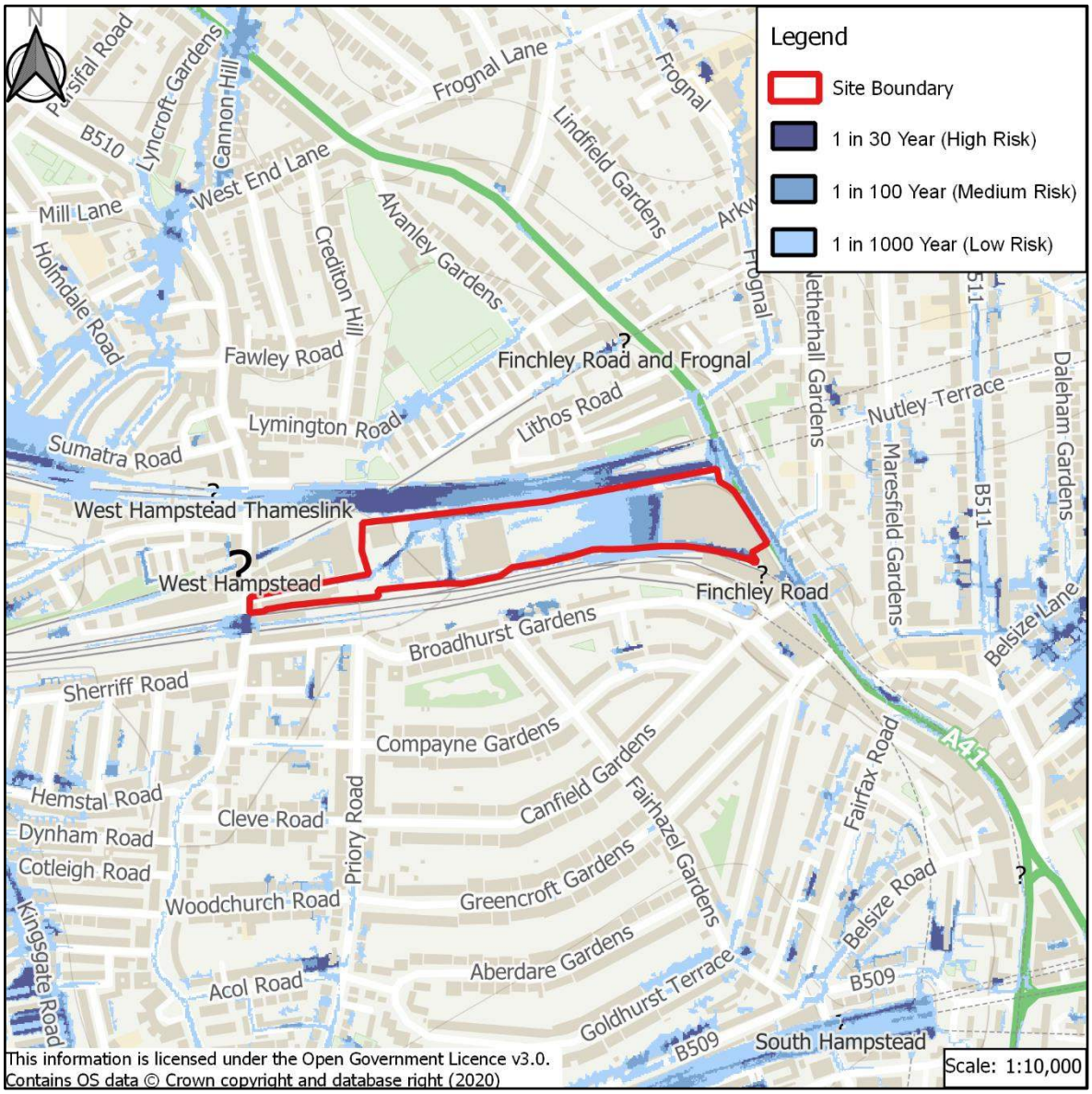
4.4.6 Furthermore, the Increased Susceptibility to Elevated Groundwater (ISEG) mapping within the SFRA reports areas where groundwater may rise within 2m of the surface. The site does not lie within this area. The SFRA also indicated that the depth of groundwater would likely be no shallower than 3m bgl.

4.4.7 Therefore, due to the types of underlying geology, non-productive designations, and the data on groundwater levels provided in the SFRA, the risk of flooding from groundwater is considered to be low. However, mitigation measures could be adopted within the design of the scheme to address any residual risk that may remain from abnormally elevated groundwater levels.

4.5 Surface Water (Pluvial)

4.5.1 The risk of flooding from surface water has been mapped by the Environment Agency on a strategic scale to understand areas that may be susceptible to ponding and routing of surface water during periods of extreme rainfall. An extract of the latest mapping is included as reference as **Figure 4.2**.

Figure 4.2 Risk of Flooding from Surface Water Map



4.5.2 The mapping indicates that generally the site is at a low risk of flooding from surface water, with small areas of moderate and high risk in the east and the west of the site. This is likely due to the current car park configuration where levels fall towards the O2 Centre and therefore any surface water shedding from the car park would be directed to this area. The topographical survey identifies a number of drainage features in this area including slot drains, gullies etc. that would seek to adequately manage the surface water generated by the car park.

4.5.3 The Thameslink railway line to the north is shown to experience large areas of high-risk ponding, but this is due to its incised nature compared to the surrounding ground levels and is unlikely to affect this site. Furthermore, the Camden SFRA confirms the site to lie within a Critical Drainage Area (Group3_010) and bordering the Goldhurst Local Flood Risk Zone. The CDA is a large area between Hamstead and Kilburn covering many residential areas where surface and sewer flooding have been previously noted. Designation within a Critical Drainage Area does not mean an area is at a higher risk of flooding than other areas, however, it may contribute towards flooding elsewhere.

4.5.4 Overall, the risk posed to the site is minimal and any risk is associated with surface water generated by the site area. It is not subject to significant flow routing through the site or from runoff generated by the wider area. Redevelopment of the site will afford the opportunity to manage runoff in a sustainable way and should be incorporated as part of a package of mitigation.

4.6 Sewers

4.6.1 A review of sewer records for the area, included as **Appendix 2**, shows a network of sewerage assets across the site and in proximity. Public storm relief sewers and combined water sewers underneath the existing buildings.

4.6.2 The Storm Water relief sewer is estimated to be approximately at 18m depth, running north to south with a diameter of approximately 2.6m. The combined water sewers are approximately 1.2m by 0.8m in diameter and run below the west of the site at approximately 3.5m to 5.5m bgl.

4.6.3 There are also private sewerage systems which serve the site's buildings and the car park. This involves a gravity fed system of manholes and gullies which discharges to the Thames Water public sewerage system. This system, however, only serves the site and will be abandoned as part of the new proposals and any diversions will be designed in such a way to manage flood risk as far as possible.

4.6.4 Private foul and surface water pumping stations are located within the service road to the south of existing O2 centre to serve the lower basement area and low levels of service road. These are pumped via rising mains back to the private foul and surface sewers within the main car park area.

4.6.5 A review of information contained in the Camden SFRA suggests the site partially falls within the 'NW6 3' post code area, which has reported a total of 8 instances of internal sewer flooding (known as DG5 registered properties) and 18 properties listed as experiencing exterior sewer flooding. However, the area comprises a number of residential streets and so is unlikely to reflect a significant risk of sewer flooding within the site, which comprises largely commercial and retail properties.

4.6.6 Therefore, the risk of flooding associated with sewers is considered to be low.

4.7 Canals

4.7.1 The nearest canal to the site is Regent's Canal approximately 1.8km to the south.

4.7.2 Due to the distance of the canal from the site and the intervening topography, the risk of flooding from canals if considered to be low.

4.8 Reservoirs

4.8.1 The Environment Agency has produced strategic-scale mapping showing the potential risk of flooding from failure of large waterbodies and reservoirs, if the relevant impounding structure were to fail.

4.8.2 The mapping confirms the site is far removed from the extent of any potential flooding from such structures. Flooding from Hampstead Ponds is shown to flow eastwards from Hampstead towards Gospel Oak and away from the proposed development site.

4.8.3 In conclusion, the site is considered at low risk of flooding from reservoirs and other large waterbodies.

4.9 Impact of the Proposed Development

4.9.1 The site is not within defined floodplain of any nearby watercourses and as such is unlikely to detrimentally affect floodplain volumes or conveyance routes.

4.9.2 The site is already previously developed and includes drainage infrastructure to manage surface water and therefore proposals are unlikely to increase the volume of water generated by the site. Nevertheless, in accordance with the NPPF, Local Plan policies and overarching aims of the London Plan new developments should seek to reduce the peak rate of runoff as far as practical to contribute to a reduction in flood risk through sustainable management of surface water.

5 Flood Risk Mitigation

5.1 Sequential Arrangement

5.1.1 The site is considered sequentially preferable due to its location within Flood Zone 1 and therefore passes the requirements of the Sequential Test.

5.2 Development Levels

5.2.1 There are no specific requirements for finished flood levels to address the low risk of fluvial flooding. However, it is recommended that appropriate design of external levels and their relation to building thresholds considers the potential residual risk groundwater flooding and potential overland flows from surface water runoff.

5.2.2 In particular, finished floor levels should be designed so there is a nominal threshold above surrounding ground levels, in accordance with the relevant building regulations and generally external levels should be designed so that any surface flows shed away from buildings and towards landscaping and positively drained areas.

5.3 Surface Water Drainage Strategy

5.3.1 Due to the nature of the development and changes to impermeable surfaces and land use, a surface water drainage strategy has been prepared for the submitted scheme.

5.3.2 In summary, the strategy is based on discharging surface water runoff from the site at a controlled rate, and provision of attenuation features to manage and store the additional runoff from the proposed development. Recommendations have been made for other SuDS measures that could be incorporated throughout the development to provide improvements to water quality and meet with local requirements as laid out within the Camden Local Plan 2017 and the supplementary guidance on water efficiency and flood risk management laid out in the Water and Flooding Camden Planning Guidance document.

5.3.3 Subject to an appropriate strategy for restricting runoff to a low rate coupled with sustainable management of surface water being approved, the proposed development is unlikely to increase flood risk elsewhere and will likely contribute to a reduction in flood risk.

6 Conclusions & Recommendations

6.1.1 This Flood Risk Assessment has been written in support of an application made in part detail and part outline ('the Application') for the demolition and redevelopment ('the Proposed Development') of the O2 Centre – Finchley Road site. The site is sequentially preferable due to its location wholly within Flood Zone 1 and therefore is considered a suitable development in flood risk terms for the proposed use.

6.1.2 The summarise the findings of the FRA

- The site is shown to be in Flood Zone 1 and so considered at low risk of flooding from fluvial and tidal sources
- The area has a low susceptibility to groundwater emergence and the risk of flooding remains relatively low.
- The risk of flooding from surface water mapping shows areas of moderate to high risk across the site, resulting from runoff generated by the site only. Sustainable management of surface water as part of the development proposals would seek to manage and mitigate this risk.

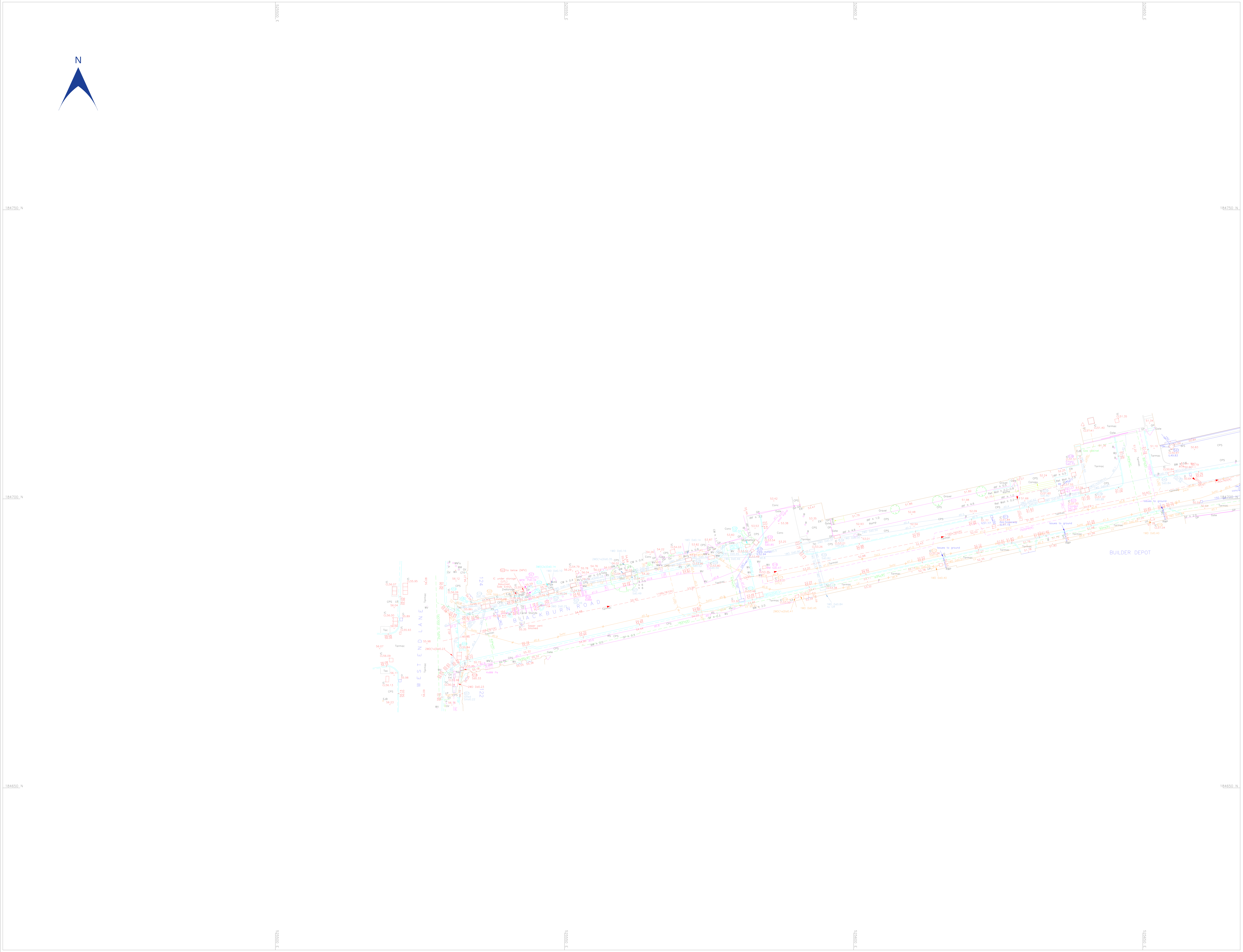
6.1.3 Recommendations are made in respect of appropriate consideration of finished floor levels and external levels design to manage any residual risk of overland flows by conveying water away from buildings and towards positively drained areas.

6.1.4 A surface water drainage strategy based on sustainable drainage principles has been developed that seeks to restrict runoff from the development to a rate less than the current rate to contribute to a reduction in flood risk in line with the NPPF and Local Plan policies.

6.1.5 In accordance with the requirements of the National Planning Policy Framework (NPPF), this FRA has demonstrated the development could proceed without being subject to significance flood risk and complies within relevant Local Plan policies.

6.1.6 Furthermore, the development will not result in increased flood risk to third parties if there is suitable management of surface water runoff.

Appendix 1 Topographical Survey



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40070T-01-1 | 40070T-01-2 | 40070T-01-3 | 40070T-01-4 | 40070T-01-5

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Landsec

100 Victoria Street
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Topographic Survey and UGS

PRESENTATION SCALE 1:200 @ A0

DATE OF ORIGINAL SURVEY August 2018

PC PROJECT No. 40070 CHECKED DGR

DRAWING No. 40070T-01-1 ISSUE E

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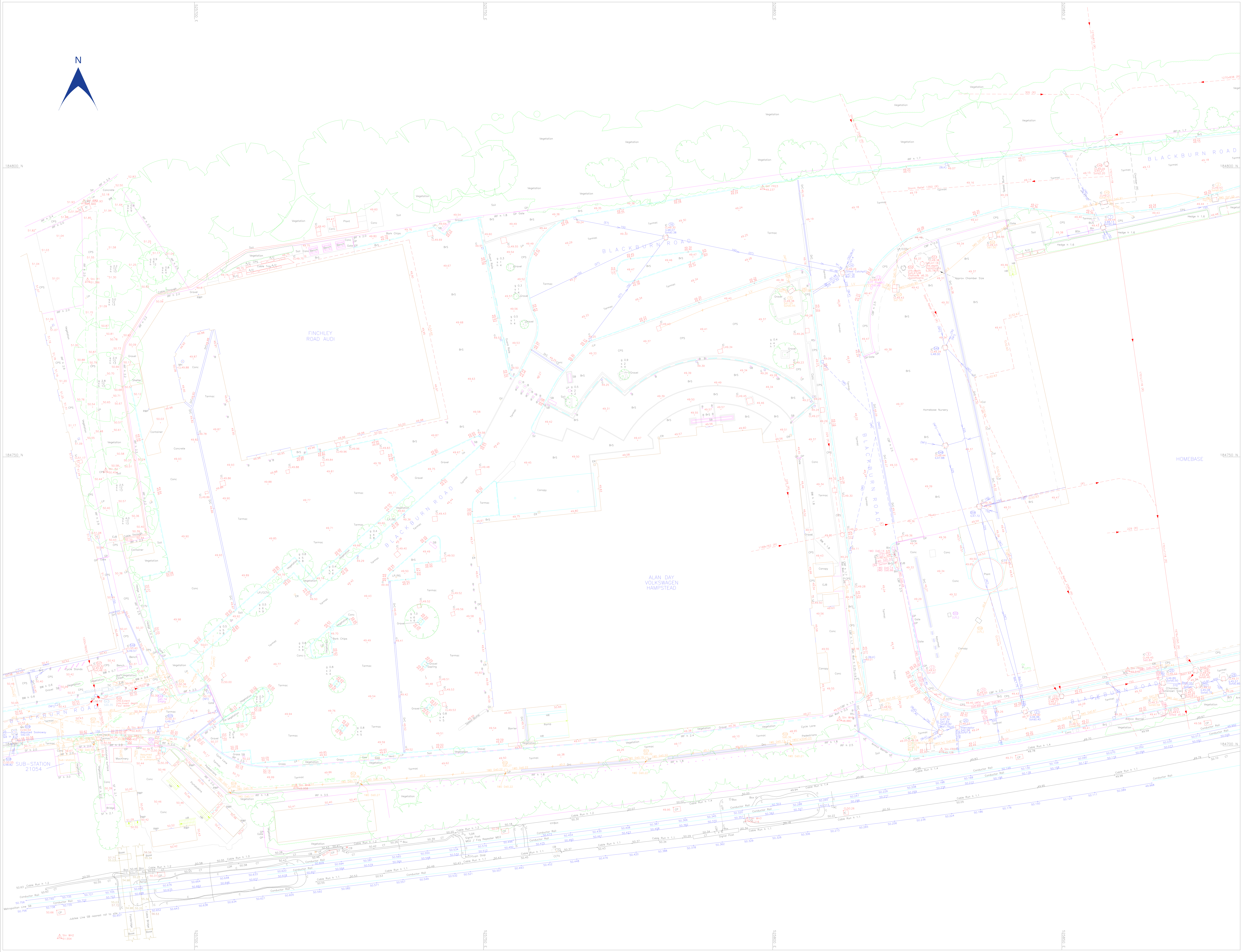

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DRAWING No. 40070T-01-2 ISSUE E

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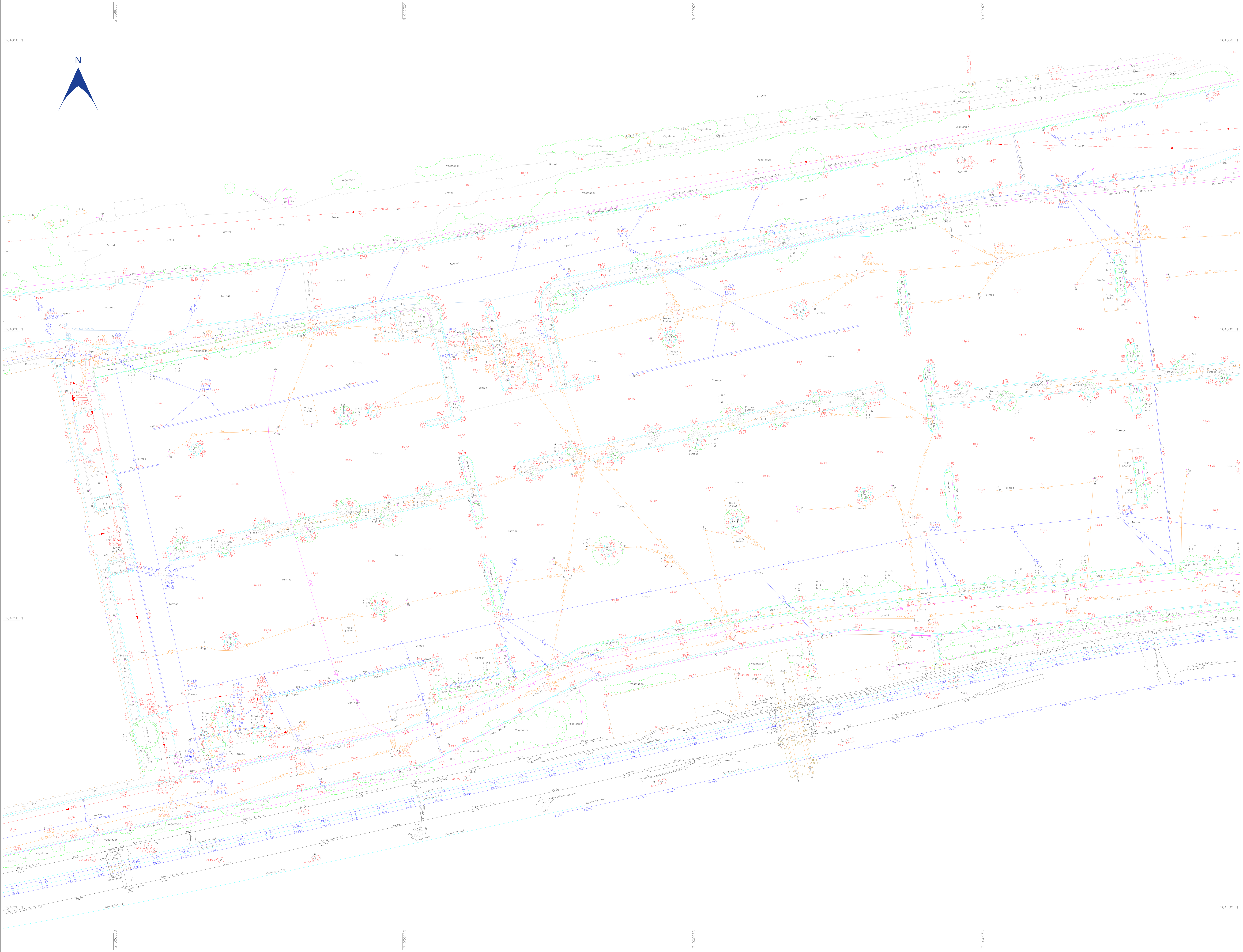

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SHEET LAYOUT

40070T-01-1 | 40070T-01-2 | 40070T-01-3 | 40070T-01-4 | 40070T-01-5

ISSUES & REVISIONS

Issue	Details	By	Date
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Jubilee line SB rail added from scanned data, with lower accuracy.

CLIENT

Landsec

100 Victoria Street
London
SW1E 5JE

PROJECT TITLE

O2 Centre

255 Finchley Road NW3 6LU

Topographic Survey and UGS

PRESENTATION SCALE: 1:200 @ A0

DATE OF ORIGINAL SURVEY: August 2018

PC PROJECT No. 40070 CHECKED DGR

DRAWING No. 40070T-01-3 ISSUE E

Plowman Craven

Plowman Craven House
2 Lea Business Park
Lower Luton Road
Harpenden
Hertfordshire
AL5 5EQ

115 Southwark Bridge Road
London
SE1 0AX

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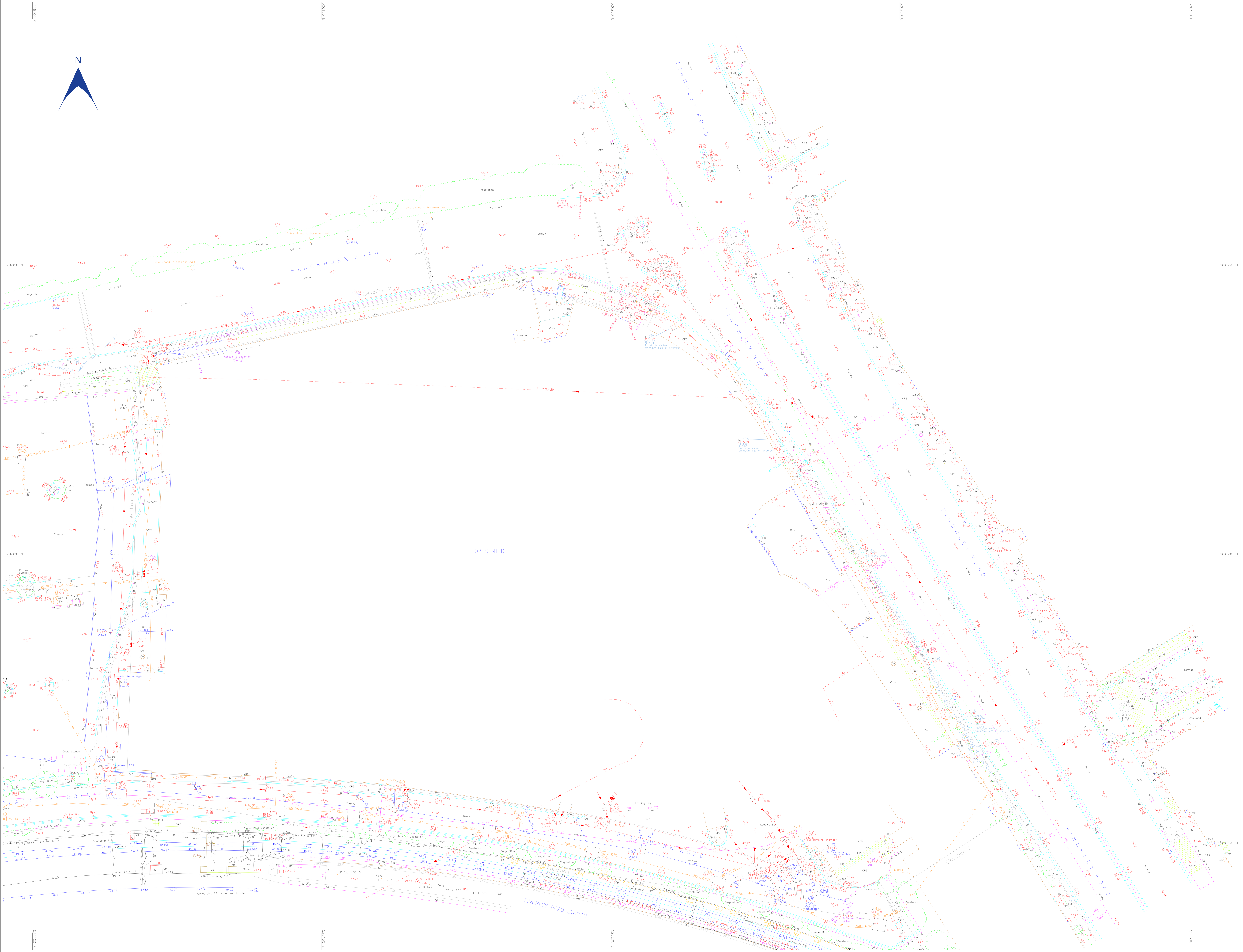
Tel: +44 (0)207 490 7700
Email: post@plowmancraven.co.uk
Web: www.plowmancraven.co.uk



STANDARD ABBREVIATIONS

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

SERVICE ABBREVIATIONS

(AR)	Assumed Route	Pd	Depth to top of pipe
Bdd	Back Drop Depth	PE	Polyethylene
BdL	Back Drop Level	(R)	From Records
(BLK)	Blocked	RWP	Rain water Pipe
CCTV	Closed Circuit TV	(s)	Service Cable
(COG)	Cable on Ground	Sofd	Soffit Depth
CR	Cable Riser	Sd	Sump Depth
d	Depth of service (approx)	SL	Sump Level
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(ET)	Electronically Traced	(UTL)	Unable to Lift without damage
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RAIL ABBREVIATIONS

AC	Axle Counter	IC	Inspection Cover
AWS	Automatic Warning System	J4	Rail Joint 4 Bolt
B	Bollard	J6	Rail Joint 6 Bolt
C	Cable	LDR	Ladder
CB	Concrete Base	LOC	Location Box
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CK	Crossing Knuckle	LST	Lineside Telephone
CN	Crossing Nose	LTB	Last Timber Bearer
COL	Column	MB	Motor Bearer
CONC	Concrete	MP	Mile Post
CP	Catch Pit	OH	Over Head
CR	Check Rail	OLE	Overhead Line Equipment
CT	Cable Troughing	P	Post
DEP	Designated Earthing Point	PB	Protection Board
DOP	Down Pipe	PR	Points Rodding
DP	Datum Plate	PTS	Points
DRC	Drainage Channel	RA	Red Aspect
EJ	Expansion Joint	RWP	Rain Water Pipe
ER	Earthing Rod	s	Spread
FW	Flash Butt Weld	SH	Switch Heater
g	Girth	SM	Switch Motor
G	Gully	SPT	Signal Post Telephone
GG	Grease Gun	SR	Speed Restriction
GP	Grease Pot	SRE	Side Ramp End
h	Height	STB	Stretcher Bar
HABD	Hot Axle Box Detector	TGM	Track Geometry Marking
HR	Hand Rail	TP	Telegraph Pole
IB	Impedance Bond	TPWS	Train Protection Warning System
IBJ4	Insulated Block Joint 4	TR	Transition Rail
IBJ6	Insulated Block Joint 6	TW	Thermic Weld
		UTP	Under Track Pipe

SERVICE LEGEND

FOUL DRAINAGE
SURFACE WATER DRAINAGE
WATER
GAS
ELECTRICITY
TELEPHONE
CABLE TV
TRAFFIC CONTROL
UNKNOWN SERVICE
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40070T-01-1
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CLIENT

Landsec

100 Victoria Street
London
SW1E 5JE

PROJECT TITLE

O2 Centre

255 Finchley Road NW3 6LU

Topographic Survey and UGS

PRESENTATION SCALE 1:200 @ A0

DATE OF ORIGINAL SURVEY August 2018

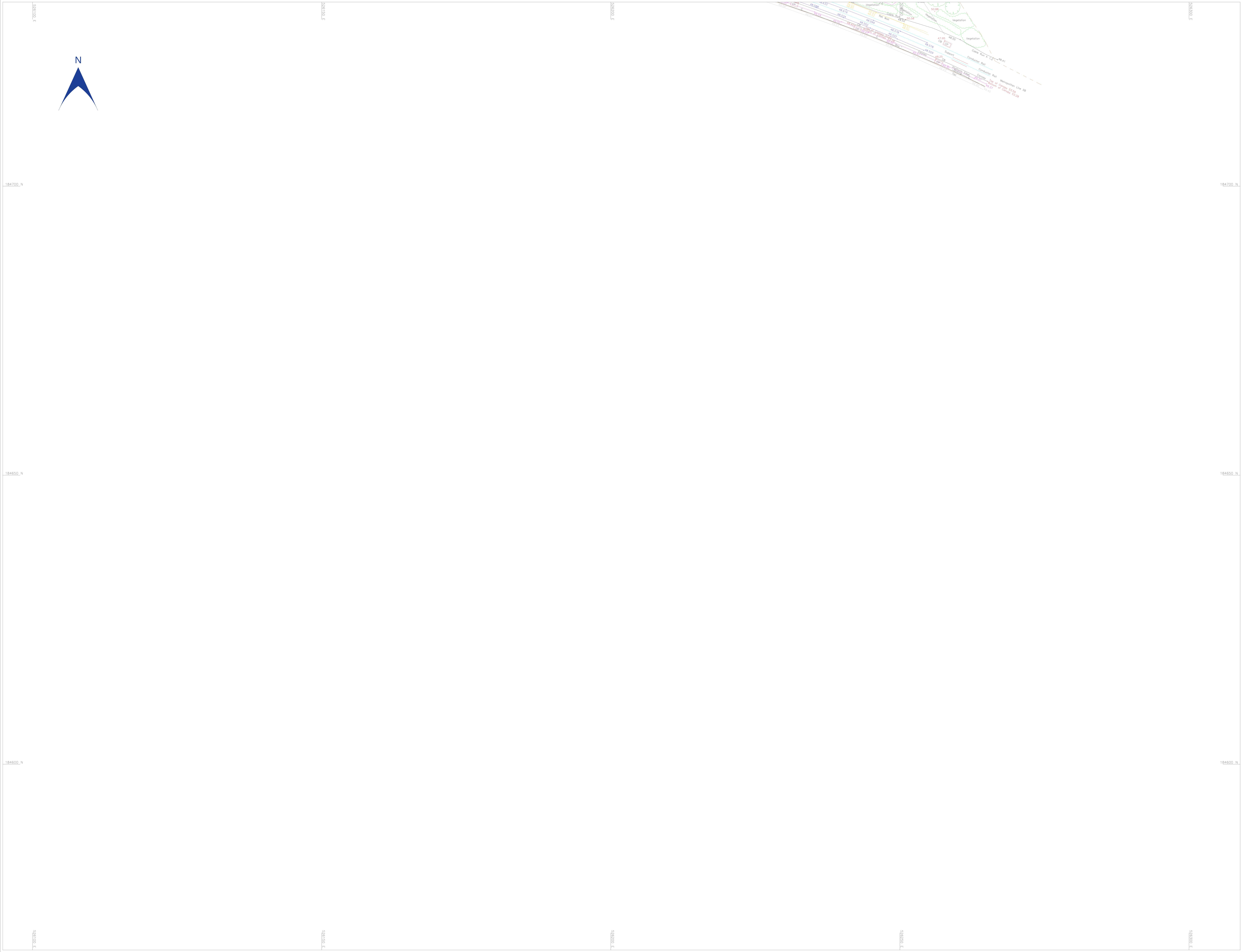
PC PROJECT No. 40070 CHECKED DGR

DRAWING No. 40070T-01-4 ISSUE E

Plowman Craven

Plowman Craven House
2 Lea Business Park
Lower Luton Road
Harpenden
Hertfordshire
AL5 5EQ
Tel: +44 (0)1582 765566
Email: post@plowmancraven.co.uk
Web: www.plowmancraven.co.uk

115 Southwark Bridge Road
London
SE1 0AX
Tel: +44 (0)207 490 7700



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100 Victoria Street
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255 Finchley Road NW3 6LU

Topographic Survey and UGS

PRESENTATION SCALE 1:200 @ A0

DATE OF ORIGINAL SURVEY August 2018

PC PROJECT No. 40070 CHECKED DGR

DRAWING No. 40070T-01-5 ISSUE E

Plowman Craven

Plowman Craven House
2 Lea Business Park
Lower Luton Road
Harpenden
Hertfordshire
AL5 5EQ

115 Southwark Bridge Road
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SE1 0AX

Tel: +44 (0)1582 765566
Tel: +44 (0)207 490 7700
Email: post@plowmancraven.co.uk
Web: www.plowmancraven.co.uk

Appendix 2 Sewer Records

Asset location search

Property Searches

Pell Frischmann Consultants Ltd
4-5
4-5Manchester Square
LONDON
W1U 3PD

Search address supplied

O2 Management Centre
O2 Centre
255
Finchley Road
London
NW3 6LU

Your reference O2 Finchley

Our reference ALS/ALS Standard/2018_3767718

Search date 4 April 2018

Keeping you up-to-date

Knowledge of features below the surface is essential in every development. The benefits of this not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility for any commercial or residential project.

An asset location search provides information on the location of known Thames Water clean and/or wastewater assets, including details of pipe sizes, direction of flow and depth. Please note that information on cover and invert levels will only be provided where the data is available.

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

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

0845 070 9148

searchcode

Asset location search

Property Searches

Search address supplied: O2 Management Centre, O2 Centre, 255, Finchley Road, London, NW3 6LU

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

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:

TQ2584NW
TQ2584NE
TQ2684NW
TQ2685SW

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.

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

TQ2584NW
TQ2584NE
TQ2684NW
TQ2685SW

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

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

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

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

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

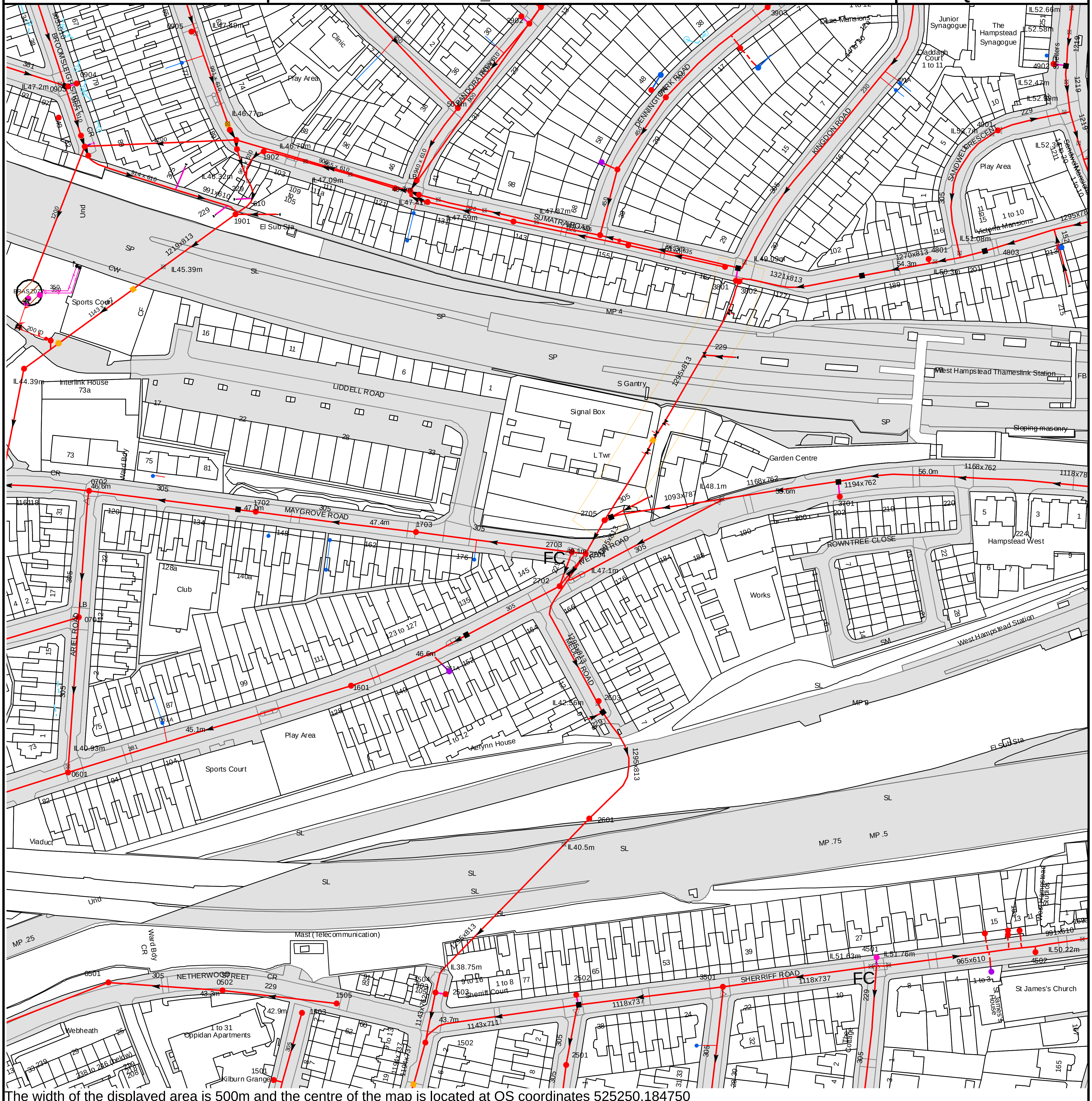
Clean Water queries

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

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

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

Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718	TQ2584NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 525250,184750

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4801	54.75	n/a
4803	n/a	n/a
48AD	n/a	n/a
4901	57.68	n/a
4501	55.34	n/a
4504	n/a	n/a
451A	n/a	n/a
4505	n/a	n/a
4507	n/a	n/a
4506	n/a	n/a
4502	n/a	n/a
1501	n/a	n/a
2501	n/a	n/a
351B	n/a	n/a
1502	n/a	n/a
1503	n/a	n/a
1505	n/a	n/a
2502	n/a	n/a
2503	n/a	n/a
1504	44.05	38.58
3501	51.18	47.27
2601	51.08	40.97
2603	48.77	n/a
1601	45.83	43.23
261A	n/a	n/a
2702	48.31	45.26
271A	n/a	n/a
2704	48.99	45.02
2703	48.72	45.94
171A	n/a	n/a
1703	47.44	44.81
2705	50.27	45.44
191A	49.87	40.28
191D	50	46.57
1702	46.98	43.68
1902	49.87	46.59
191B	49.76	47.32
181A	n/a	n/a
191F	49.7	43.21
191I	n/a	n/a
191E	49.79	47.46
191G	49.68	47.38
191C	49.65	47.49
291D	50.75	47.87
281B	50.08	47.76
281A	50.77	48.11
291E	n/a	n/a
291B	51.27	48.58
281D	n/a	n/a
281C	50.9	48.34
29BF	n/a	n/a
39CD	n/a	n/a
391A	52.11	49.57
39BJ	n/a	n/a
39CA	n/a	n/a
381A	51.65	48.84
3801	n/a	n/a
3802	n/a	48.02
3904	n/a	n/a
39CF	n/a	n/a
3701	n/a	n/a
491C	n/a	n/a
491A	n/a	n/a
4902	n/a	n/a
491B	n/a	n/a
3903	54.46	51.65
291A	51.92	43.88
2902	n/a	n/a
291C	51.92	48.55
09FA	n/a	n/a
091D	n/a	n/a
09EJ	n/a	n/a
0905	51.11	n/a
09EI	n/a	n/a
09DJ	n/a	n/a
081E	51.9	44.96
081B	51.69	n/a
081C	51.69	n/a
081D	51.69	n/a
081A	51.89	44.69
09CB	n/a	n/a
0903	n/a	n/a
0904	50.32	n/a
091C	49.67	46.77
09FB	n/a	n/a
09FD	n/a	n/a
091B	49.54	39.9
091A	49.39	46.66
0702	46.62	42.76
09FC	n/a	n/a
071A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
191H	50.18	46.69
1901	49.34	45.97
0502	n/a	n/a
0501	n/a	n/a
0601	44.64	40.85
061A	n/a	n/a
0701	45.8	42.09
171B	n/a	n/a
171C	n/a	n/a

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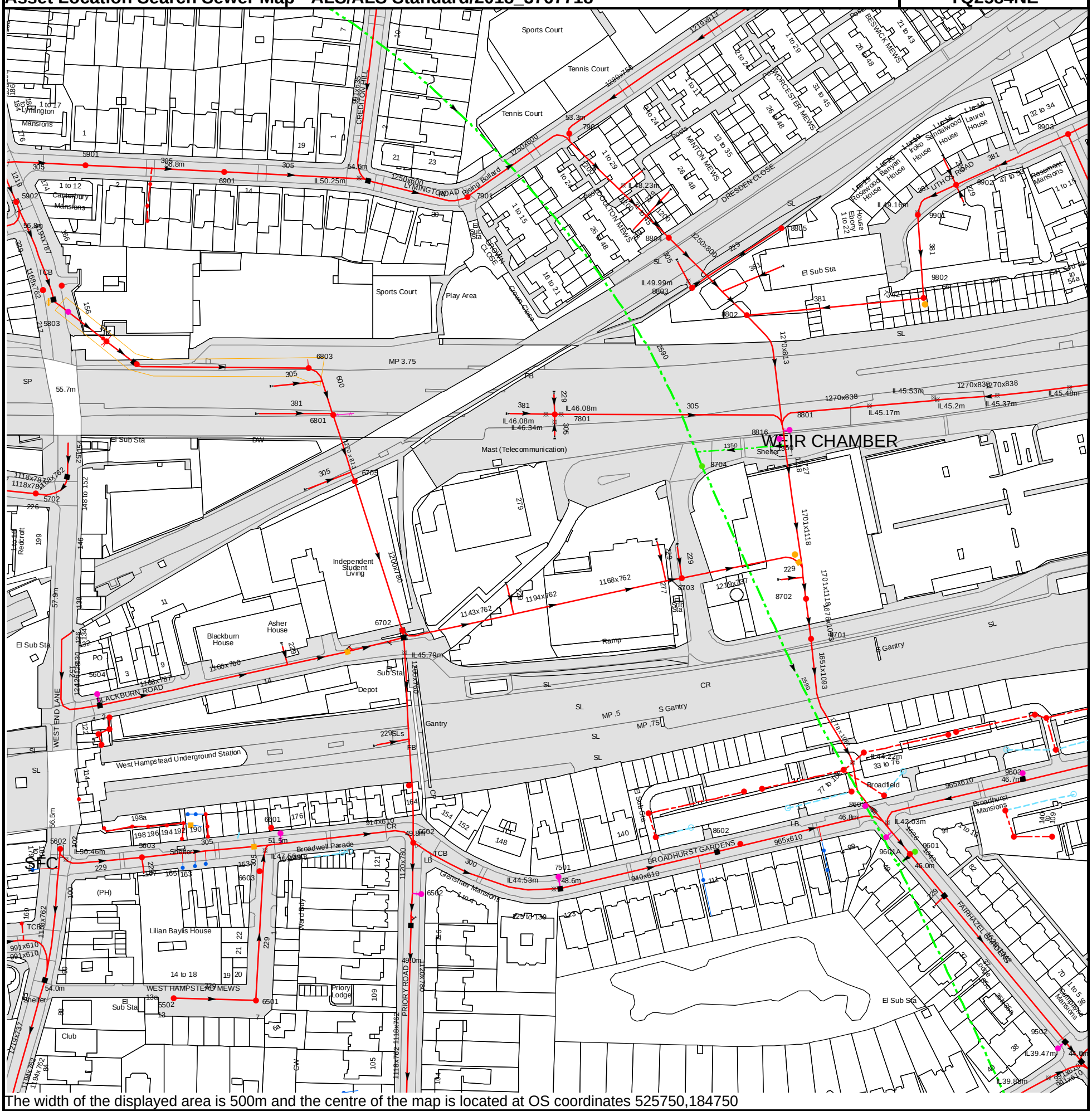
Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718

TQ2584NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 525750,184750

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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
96BI	n/a	n/a
96CE	n/a	n/a
96CD	n/a	n/a
96CB	n/a	n/a
96CC	n/a	n/a
8701	49.78	44.64
8702	49.13	44.68
8816	49.1	44.2
8801	n/a	n/a
8802	53.15	46.06
76AB	n/a	n/a
76AC	n/a	n/a
86BD	n/a	n/a
8602	47.38	43.41
86BC	n/a	n/a
86BB	n/a	n/a
86BE	n/a	n/a
861B	n/a	n/a
86AJ	n/a	n/a
86BF	n/a	n/a
86AI	n/a	n/a
8603	46.58	44.58
96CF	n/a	n/a
961A	n/a	n/a
96CG	n/a	n/a
9601	46.6	29.86
96BD	n/a	n/a
96BG	n/a	n/a
9603	46.67	n/a
96BF	n/a	n/a
96CA	n/a	n/a
96BC	n/a	n/a
9502	44.25	39.42
851B	n/a	n/a
7501	n/a	n/a
861A	n/a	n/a
9601A	46.15	41.36
6501	50.84	49.56
6502	n/a	n/a
6603	n/a	n/a
561G	n/a	n/a
561F	n/a	n/a
561E	n/a	n/a
66BE	n/a	n/a
66BF	n/a	n/a
6602	49.87	45.06
56CD	n/a	n/a
6601	n/a	n/a
66DJ	n/a	n/a
56CC	n/a	n/a
56CI	n/a	n/a
56CB	n/a	n/a
561A	n/a	n/a
561B	n/a	n/a
66CI	n/a	n/a
56BG	n/a	n/a
581C	50.23	47.53
5907	n/a	n/a
5906	n/a	n/a
5908	n/a	n/a
6901	56.15	50.97
6803	48.34	46.65
6801	48.05	46.42
6705	n/a	46.25
6702	50.83	46.18
7901	53.34	49.07
7801	48.05	n/a
8804	n/a	n/a
8703	48.77	45.2
8803	52.01	49.2
8704	48.56	30.78
56BE	n/a	n/a
56BF	n/a	n/a
56BH	n/a	n/a
5604	n/a	n/a
5702	56.02	51.43
581A	55.17	47.62
5803	55.64	51.24
581D	50.23	47.53
581F	50.23	47.53
581E	50.23	47.53
5902	56.84	52.16
5901	57.21	51.77
551A	n/a	n/a
561C	n/a	n/a
5602	55.89	49.55
561D	n/a	n/a
56DC	n/a	n/a
56DB	n/a	n/a
5603	53.54	49.43

Manhole Reference	Manhole Cover Level	Manhole Invert Level
56DA	n/a	n/a
56CJ	n/a	n/a
5502	52.33	50.48
56DD	n/a	n/a
9802	53.42	48.16
8805	52.9	50.57
9901	53.22	49.09
9902	54.18	49.87
9903	55.25	51.37
7902	53.14	48.56

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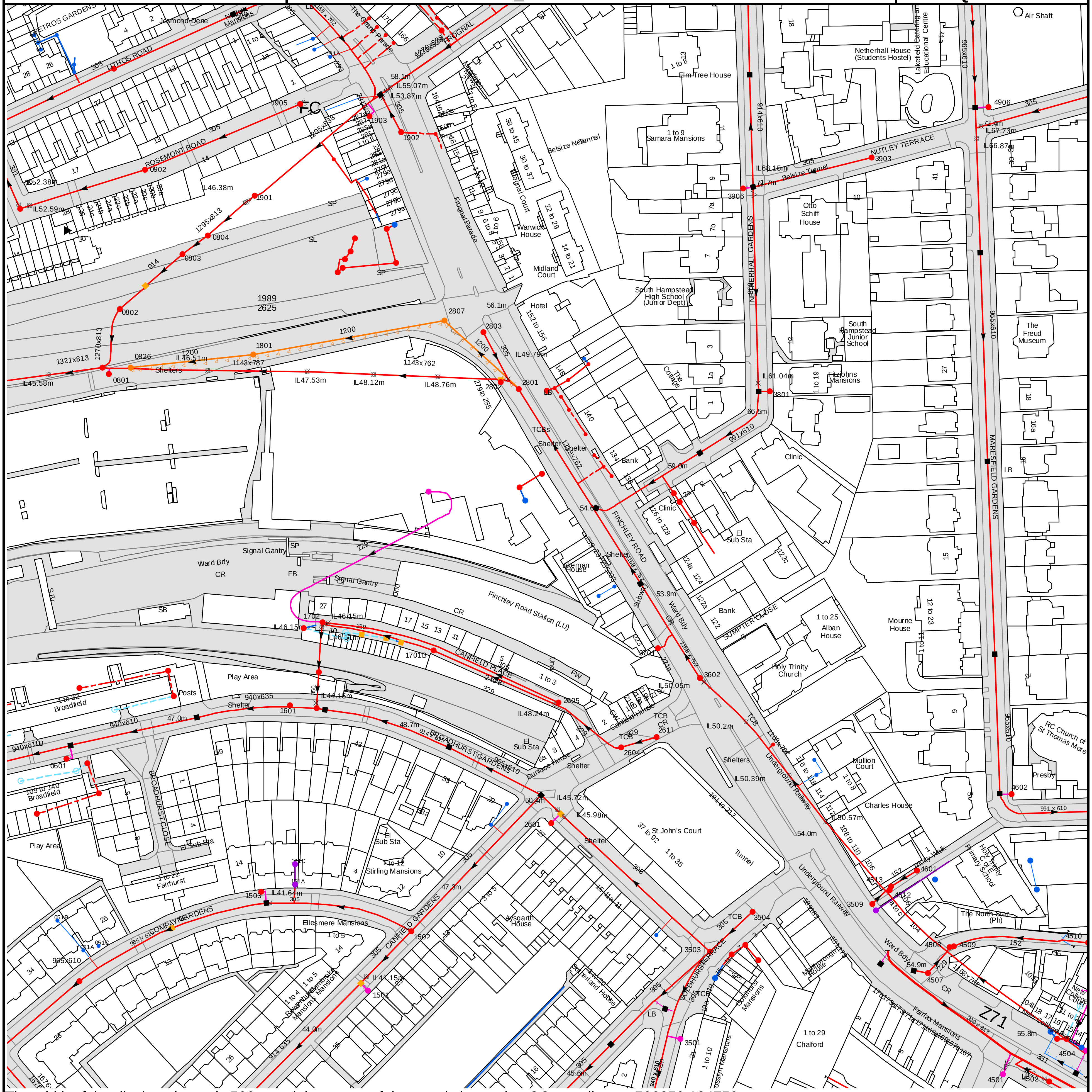
Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718	TQ2684NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 526250,184750

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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
4906	n/a	n/a
4501	54.71	n/a
4602	n/a	n/a
46AI	n/a	n/a
45DG	n/a	n/a
4502	55.61	49.91
45DC	n/a	n/a
45DA	n/a	n/a
45CJ	n/a	n/a
45CI	n/a	n/a
45DB	n/a	n/a
4504	56.29	51.57
4510	61.48	n/a
35BJ	n/a	n/a
4507	54.72	53.27
35CD	n/a	n/a
35CB	n/a	n/a
4508	56.38	53.21
4509	56.52	55.45
35CC	n/a	n/a
3504	52.33	48.88
451A	n/a	n/a
3509	54.32	52.46
4512	55.99	50.83
4513	55.96	52.38
45EF	n/a	n/a
261B	n/a	n/a
261A	n/a	n/a
2601	n/a	n/a
2605	52.05	50.07
271B	n/a	n/a
271C	n/a	n/a
2604	52.67	48.54
2611	53.12	49.01
3701	n/a	n/a
3705	n/a	n/a
3706	n/a	n/a
3602	53.34	52.43
361A	n/a	n/a
361B	n/a	n/a
361C	n/a	n/a
4601	58.43	57.79
2803	55.99	52.04
2802	n/a	n/a
2801	55.4	49.44
27CJ	n/a	n/a
27CI	n/a	n/a
27DA	n/a	n/a
28CI	n/a	n/a
28CH	n/a	n/a
281C	n/a	n/a
28CG	n/a	n/a
281B	n/a	n/a
28CE	n/a	n/a
281A	n/a	n/a
28CF	n/a	n/a
271E	n/a	n/a
271D	n/a	n/a
271A	n/a	n/a
3704	n/a	n/a
3906	n/a	n/a
3801	n/a	n/a
3903	72.04	69.19
3501	n/a	n/a
1501	45.13	n/a
3503	50.97	47.23
351A	n/a	n/a
1502	46.46	42.31
1503	n/a	n/a
151A	n/a	n/a
161C	n/a	n/a
161B	n/a	n/a
1601	47.44	43.74
06BH	n/a	n/a
161A	n/a	n/a
06BE	n/a	n/a
1701B	50.28	47.36
17BD	n/a	n/a
17BE	n/a	n/a
17BC	n/a	n/a
1702	48.6	n/a
1703	n/a	n/a
1801	49.02	46.5
2807	55.9	48.57
18AH	n/a	n/a
18AG	n/a	n/a
18AD	n/a	n/a
18AJ	n/a	n/a
0803	49.12	46.09
18AI	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
18BB	n/a	n/a
0804	51.78	46.19
18AE	n/a	n/a
18AF	n/a	n/a
1901	56	50.41
191C	n/a	n/a
191D	n/a	n/a
291A	n/a	n/a
1902	57.86	54.02
06BG	n/a	n/a
06BB	n/a	n/a
0801	50.19	n/a
0826	49.4	46.13
auto	n/a	n/a
0802	49.31	45.87
06AF	n/a	n/a
06AJ	n/a	n/a
0601	n/a	n/a
06AG	n/a	n/a
06AH	n/a	n/a
06BA	n/a	n/a
auto	n/a	n/a
051A	n/a	n/a
051C	n/a	n/a
051B	n/a	n/a
1905	58.3	55.92
191H	n/a	n/a
191B	n/a	n/a
191A	n/a	n/a
1903	n/a	n/a
191I	n/a	n/a
191G	n/a	n/a
191F	n/a	n/a
191E	n/a	n/a
1916	n/a	n/a
2901	n/a	n/a
091A	n/a	n/a
0902	57.55	53.8
091C	n/a	n/a
091B	n/a	n/a
091H	n/a	n/a
091F	n/a	n/a
091E	n/a	n/a
091D	n/a	n/a
091G	n/a	n/a

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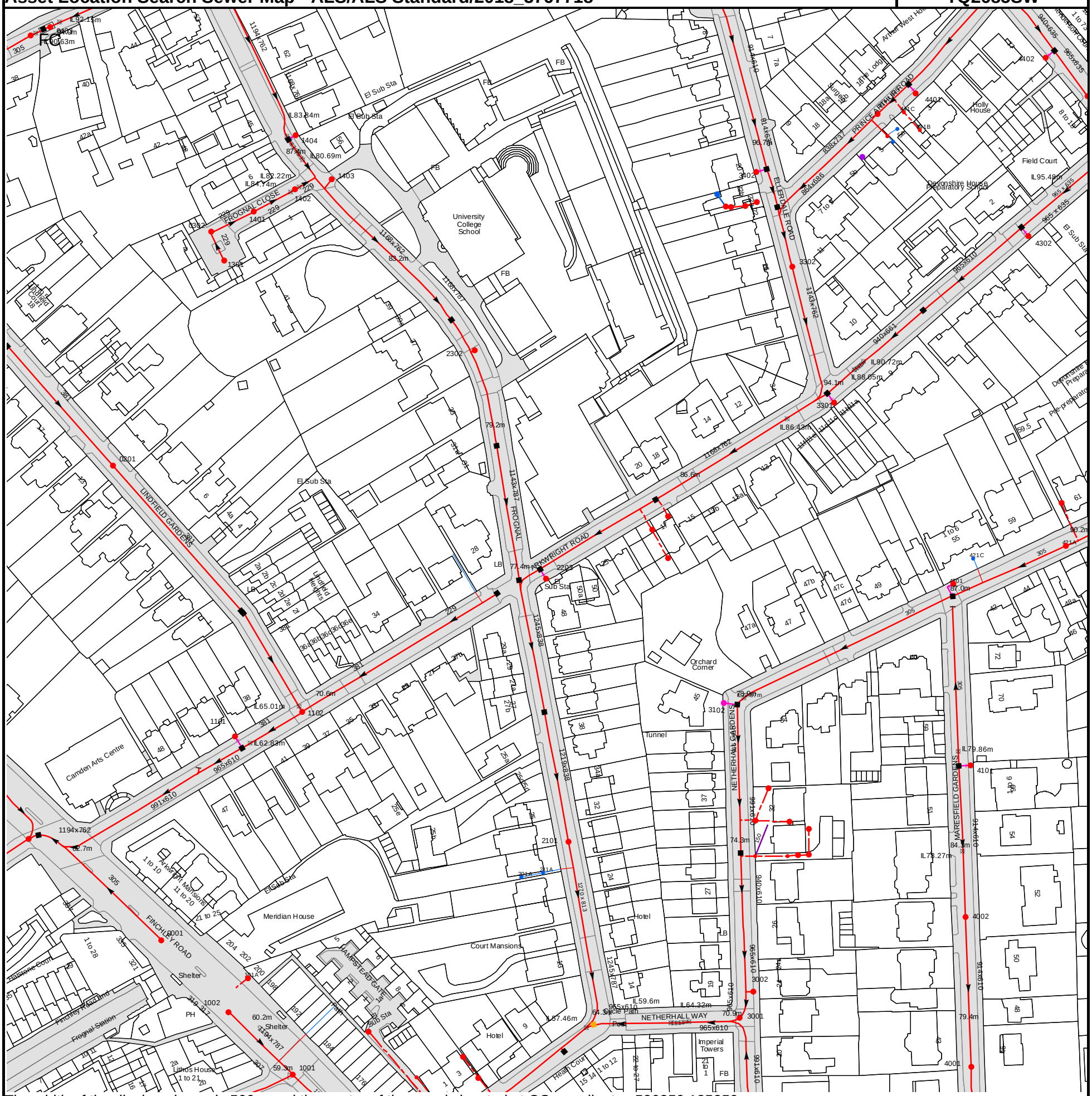
Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718

TQ2685SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 526250,185250

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Manhole Reference	Manhole Cover Level	Manhole Invert Level
34BH	n/a	n/a
34BI	n/a	n/a
34BJ	n/a	n/a
34CA	n/a	n/a
3402	n/a	n/a
34CB	n/a	n/a
341A	n/a	n/a
441G	n/a	n/a
441F	n/a	n/a
441D	n/a	n/a
441E	n/a	n/a
441C	n/a	n/a
4401	n/a	n/a
441B	n/a	n/a
4302	n/a	n/a
4402	n/a	n/a
441A	n/a	n/a
3112	n/a	n/a
3105	n/a	n/a
3111	n/a	n/a
3107	n/a	n/a
3302	n/a	n/a
3110	n/a	n/a
3108	n/a	n/a
3109	n/a	n/a
3301	n/a	n/a
4201	n/a	n/a
4002	82.58	76.52
4101	n/a	n/a
4001	76.82	71.76
421C	n/a	n/a
4206	n/a	n/a
421A	n/a	n/a
1001	59.4	54.85
1004	n/a	n/a
1005	n/a	n/a
2007	n/a	n/a
2008	n/a	n/a
3001	70.81	64.89
1002	60.41	55.76
3002	n/a	n/a
101A	n/a	n/a
201A	n/a	n/a
211A	n/a	n/a
2101	69.04	62.55
3106	n/a	n/a
1101	n/a	n/a
1102	70.36	64.86
3102	n/a	n/a
2203	n/a	n/a
3201	n/a	n/a
2210	n/a	n/a
3202	n/a	n/a
2302	n/a	n/a
1301	89.91	87.74
0302	89.8	87.09
1401	88.72	85.96
1402	86.98	n/a
1403	86.35	80.51
1404	88.07	n/a
0001	61.45	58.7
auto	n/a	n/a
auto	n/a	n/a
0403	93.85	n/a
0201	79.17	71.93

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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.

Appendix 3 Camden Flood SuDS Proforma

Pro-forma for any schemes in flood risk areas & all major development - Camden LLFA

All yellow boxes **must** be completed on this and all relevant tabs
Complete peach cells with source document and section/page references, required to support/justify responses
Do not edit grey cells
Please note guidelines / notes in column M
Complete all relevant tabs

Introduction: This Proforma is intended to help you understand the Sustainable Drainage and Flood Risk considerations that the Lead Local Flood Authority (LLFA) and Local Planning Authority (LPA) will take into account when considering an application in Camden, as well as helping us to consider the application. This does not replace the need also to provide where required a Drainage Statement, Flood Risk Assessment, and GLA-Camden SuDS Pro-forma, and observe the detailed guidance in ' Camden Planning Guidance (CPG) Water & Flooding'. Any information provided should be referenced to the relevant section of submitted supporting documents. This summary page will help provide key details on the application. Note that certain cells on this and other tabs will be populated automatically from previous answers given.

A. Application details

Planning reference (if known)				
Scheme name	O2 Fincheley Road, London			
Scheme address	255 Finchley Road, London,			
Postcode	NW36LU			
Scale of development as registered	Major			
Scale - policy subcategory	Major - largescale	Residential parts		Non-residential parts
Type(s) of development	Residential	New/re-build		
Site area, hectares	5.72	*100%*		
Of which total permeable area, to nearest 0.0001 ha	0	0%		
Of which total impermeable area, to nearest 0.0001 ha	5.14	90%		

	Existing	Proposed				
	TOTAL pre-development	For demolition	New-build incl. infills, re-build, extensions	Retained (refurbished or change of use)	TOTAL post-development	Net UPLIFT post-development
Total floor area of development (GIA)	0	0	43570	0	43570	43570
of which residential	0	0	43570	0	43570	43570
of which non- residential		51400	0	0	0	0
Number of residential units						
List all use class(es)						

Drainage Statement document details	104878-PEF-ZZ-ZZ-RP-D-100017
Flood Risk Assessment document details	104878-PEF-ZZ-ZZ-EP-D-100009

B. Flood Risk and SuDS - Policy & Documents Filter

Recommendation (Council to complete)			
	Site area 1 hectare or greater?	*Yes*	
	Major application?	*Yes*	
	In Critical Drainage Area?	Yes	
	In or bordering (<50m) Local Flood Risk Zone(s)?	Border	
	Name of LFRZ(s):	Goldhurst	
	On Historically Flooded Street 1975 or 2002?	No	
	Name of HFS(s):		
	Area at risk of flooding (surface water)?	*CHECK SITE DETAILS*	
	Elevated groundwater susceptibility or <50m of GW incid	No	
	In area with recorded sewer flooding incident?	Yes	
	In street with historical underground watercourse?	No	
	Area at risk of flooding (other relevant types)?	*Yes*	
	Basement proposed - new, enlarged or change of use?	No	
	IF YES, list proposed basement uses (all spaces):		
Approve/Condition/Refuse	*IF YES, are habitable or vulnerable use(s) included?*		
Approve/Condition/Refuse	*IF NO, is other (non-basement) vulnerable development p*	Yes	
	Vulnerable development in flood-prone area?	*Yes*	
	Site-specific Flood Risk Assessment (FRA) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Site-specific FRA submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Drainage Statement (DS) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	DS submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Sustainable drainage (SuDS) proposals required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	SuDS proposals submitted?	Yes	**If Yes, go to SuDS Proposals tab**
	FRA/DS/SuDS supporting evidence required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Supporting evidence submitted?	Yes	**If Yes, go to Flood Risk Proposals &/or SuDS Proposals ta**

Flood Risk Assessment, Proposals & Evidence

Recommendation (Council to complete)	**Assessments**	Required?	Document submitted?	Document title	Page/ section reference
	Site-specific Flood Risk Assessment	*CHECK SITE DETAILS*	*Yes*	104878-PEF-ZZ-ZZ-RP-D-100009	
	Drainage Statement	*CHECK SITE DETAILS*	*Yes*		
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100017	
	SuDS Proposals	*CHECK SITE DETAILS*	*Yes*	104878-PEF-ZZ-ZZ-RP-D-100017	
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100017	

Recommendation (Council to complete)	**Policy compliance**	Required?	Requirement met?	Document title	Page/ section reference
	Assessments address local, regional & national policies	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 3
	include suitable research & quantification of site flood risks	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 4
	address cumulative impact of developments	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 2
	propose suitable flood ingress internal coping measures	*CHECK SITE DETAILS*	No		
	propose suitable flood risk mitigation measures	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 5
	Internal water consumption target 105 l/p/d (residential)	*Yes*	N/A		
	External water consumption target 5 l/p/d (residential)	*Yes*	N/A		
	BREEAM Excellent water consumption target (non-resi >500m2)	*No*	Residential		
	Will not locate vulnerable development in flood-prone area	*Yes*	*No*	104878-PEF-ZZ-ZZ-RP-D-100009	Section 5
	Scheme does not increase flood risk on & off site	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 6
	Scheme reduces on&off-site flood risk where possible	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 5

Recommendation (Council to complete)	**Evidence supporting Assessments & Proposals**	Required?	Evidence submitted?	Document title	Page/ section reference
	Drawings showing site-specific flood risk up to 100yr+40%	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 4
	Drawings showing proposed internal coping measures	*CHECK SITE DETAILS*	No		
	Drawings showing proposed flood mitigation measures	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100017	Appendix D
	Drawings showing proposed basement/ground floor uses	*CHECK SITE DETAILS*	Yes	Submitted Layout Plans	
	Building flood risk emergency evacuation plan		No		
	Drawings showing on&off-site overland exceedance flows	*CHECK SITE DETAILS*	No		
	Internal water calculations & proposals (resi)	*Yes*	No		
	External water calculations & proposals (resi)	*Yes*	No		
	BREEAM water calculations & proposals (non-resi >500m2)	*No*	Residential		

Guidelines / notes

Policy CC3 c. consider the impact of development in areas at risk of flooding

Policy CC3 c. consider the impact of development in areas at risk of flooding
(including drainage);

Policy CC3 b. avoid harm to the water environment and improve water quality& e. utilise Sustainable Drainage Systems (SuDS) in line with the drainagehierarchy to achieve a greenfield run-off rate where feasible

including Local Plan CC3, CPG, new London Plan, National Planning Policy Framework
including Strategic Flood Risk Assessment, Update LFRZ Map & EA Mapping
Policy CC3 c. consider the impact of development in areas at risk of flooding
Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;
Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;

Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures

Policy CC3 f. not locate vulnerable development in flood-prone areas.
Policy CC3 The Council will seek to ensure that development does not increase flood risk
Policy CC3 The Council will seek to ensure that development...reduces the risk of flooding where possible

allowing 300mm freeboard to potential water ingress points

Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures

Sustainable Drainage (SuDS) Assessment, Evidence and Proposals

Recommendation (Council to complete)	**Assessments**	Document submitted?	Document title	Page/ section reference
	Drainage Statement (DS)	*Yes*	104878-PEF-ZZ-ZZ-EP-D-100017	
	GLA-Camden SuDS Pro-forma (fully completed)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix E & F

Recommendation (Council to complete)	**Policy compliance**	Requirement met?	Document title	Page/ section reference
	DS must include identification of flood risk	Yes	104878-PEF-ZZ-ZZ-EP-D-100009	FRA document
	DS must include assessment of existing, greenfield & proposed runoff rates	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3
	DS must include identification of measures, in line with the drainage hierarchy, to reduce runoff rates	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3
	Achieve greenfield runoff rates wherever feasible, or as close as possible	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Sections 3, 4 & 5
	Constrain runoff volumes to greenfield for 100yr 6hr event where feasible	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Sections 3, 4 & 5
	Backstop target for unaltered buildings: >50% reduction in existing run-off	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Sections 3, 4 & 5
	Developments must include SuDS unless inappropriate	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.5
	Development should follow the detailed London Plan drainage hierarchy	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.1
	EA climate change factor applied: 2080s upper rainfall intensity allowance (40%)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix C

Recommendation (Council to complete)	**Evidence supporting Assessments & Proposals**	Evidence submitted?	Document title	Page/ section reference
	Drawings detailing SuDS extent & position (incl. outfalls, control points, levels)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix D
	Blue-green roof details with area & minimum 150mm substrate for storage	No		
	Results of cross-site infiltration rate or similar tests to show soil (in)compatibility	Yes	Geo-Environmental Report	
	Professional run-off calculations supporting rates & volumes reported in DS	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix C and Section 2
	Drawings showing on&off-site overland exceedance flows	No	104878-PEF-ZZ-ZZ-EP-D-100009	No exceedance routes predicted
	Evidence of site surveys and investigations relating to drainage	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appedix A, B and E
	Lifetime maintenance and adoption arrangements (and maintenance owner)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.6
	Management of health & safety risks related to SuDS design	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.5
	Confirmation of discharge capacity (or correspondence) from relevant body eg TW	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix E

Guidelines / notes

Policy CC3 c. consider the impact of development in areas at risk of flooding (including drainage);

Download from www.london.gov.uk/what-we-do/environment/climate-change/surface-

Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible
& Policy CC3 supporting text §8.67

Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible
& Policy CC3 supporting text §8.66

Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible
& Policy CC3 supporting text §8.68

Appendix 4 Camden SuDS Proforma

The London Sustainable Drainage Proforma

Introduction

This proforma is intended to accompany a drainage strategy prepared for a planning application where required by national or local planning policy. It should be used to summarise the key outputs from the strategy to allow assessing officers at the Lead Local Flood Authority (LLFA) to quickly assess compliance with sustainable drainage (SuDS) planning

The proforma is divided into 4 sections, which are intended to be used as follows:

1. Site and project information - Provide summary details of the development, site and drainage
2. Proposed discharge arrangement – Summarise site ground conditions to determine potential for infiltration. Select a surface water discharge method (or mix of methods) following the hierarchical approach set out in the London Plan.
3. Drainage strategy – Prioritise SuDS measures that manage runoff as close to source as possible and contribute to the four main pillars of SuDS; amenity, biodiversity, water quality and water quantity.
4. Supporting information – Provide cross references to the page or section of the drainage strategy report where the detailed information to support each element can be found. This may be more than one reference for each

Policy

Drainage strategies for developments in the London Borough of [insert borough] need to comply with the following policies on SuDS:

1. Camden Local Plan Policy CC3
2. London Plan policy 5.13 and draft New London Plan policy SI13
3. The National Planning Policy Framework (NPPF)

Technical Guidance

- Post-development surface water discharge rate should be limited to greenfield runoff rates. Proposals for higher discharge rates should be agreed with the LLFA ahead of submission of the Planning Application. Clear evidence should be provided with the Planning Application to show why greenfield rates cannot be achieved.
- Greenfield runoff rate is the runoff rate from a site in its natural state, prior to any development. This should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- Attenuation storage volumes required to reduce post-development discharge rates to greenfield rates should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- ‘CC’ refers to climate change allowance from the current Environment Agency guidance.
- An operation and maintenance strategy for proposed SuDS measures should be submitted with the Planning Application and include the details set out in section 32.2 of CIRIA C753 The SuDS Manual. The manual should be site-specific and not directly reproduce parts of The SuDS Manual.
- Other useful sources of guidance are:
  - Camden Planning Guidance 'Water and Flooding'
  - The London Plan Sustainable Design and Construction SPG
  - DEFRA non-statutory technical standards for sustainable drainage
  - Environment Agency climate change guidance
  - CIRIA C753 The SuDS Manual
  - Camden's 'SuDS in planning applications' webpage

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1. Project & Site Details		
	Project / Site Name (including sub-catchment / stage / phase where appropriate)	O2 Finchley Road, London
	Address & post code	255 Finchely Road, London, NW56LU
	OS Grid ref. (Easting, Northing)	E 526164
		N 184818
	LPA reference (if applicable)	
	Brief description of proposed work	Urban regeneration development comprising approximately 1800 units and commercial and residential spaces surrounded by landscaped areas providing a link each end of the site and provide communal areas for residents.
	Total site Area	57,218 m^2
	Total existing impervious area	51,400 m^2
	Total proposed impervious area	43,570 m^2
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
	Existing drainage connection type and location	Combined sewer drainage to the south of the site.
	Designer Name	Richard Holmes
	Designer Position	Associate
	Designer Company	Pell Frischmann

2. Proposed Discharge Arrangements			
	2a. Infiltration Feasibility		
	Superficial geology classification	No recorded superficial geology (BGS)	
	Bedrock geology classification	London Clay Formation	
	Site infiltration rate	m/s	
	Depth to groundwater level	1.26-1.89	m below ground level
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	*Proposed (Y/N)*
	1 store rainwater for later use	Y	Y
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	Y	Y
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	Y
	7 discharge rainwater to the combined sewer.	Y	Y
	2c. Proposed Discharge Details		
	Proposed discharge location	new surface and foul sewers across site	
	Has the owner/regulator of the discharge location been consulted?	Yes	

Camden

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3. Drainage Strategy

3a. Discharge Rates & Required Storage

	Greenfield (GF) runoff rate (l/s)	*Existing discharge rate (l/s)*	*Required storage for GF rate (m^3)*	*Proposed discharge rate (l/s)*
Qbar	21.5			
1 in 1	18.3	520	594	260
1 in 30	48.8	1240	2051	260
1 in 100	68.6	1337	3048	260
1 in 100 + CC			4605	260
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Hydrobrake Manhole		

3c. Proposed SuDS Measures

	Catchment area (m^2)	*Plan area (m^2)*	*Storage vol. (m^3)*
Rainwater harvesting	0		0
Infiltration systems	0		0
Green roofs	0	5650	0
Blue roofs	0	0	0
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	0	500	0
Swales	0	250	0
Basins/ponds	0	0	0
Attenuation tanks	0		2435
Total	**0**	**6400**	**2435**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Factual Ground Investgation Report - RSK Geosciences - December 2021
Drainage hierarchy (2b)	Section 3.1
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 3.2
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 3.3
Proposed SuDS measures & specifications (3b)	Section 3.5
4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Appendix B/AHMM Architects
Detailed drainage design drawings, including exceedance flow routes	100006 Existing SW Catchment 100008 Proposed SuDS 100010 Proposed DS
Detailed landscaping plans	EAST Landscape Architects
Maintenance strategy	Section 3.6
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	Section 3.5
b) biodiversity?	Section 3.5
c) amenity?	Section 3.5