LONDON OXFORD AIRPORT

Gateway Project

Outline Foul & Surface Water Drainage Strategy

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Subject: Outline Foul & Surface Water Drainage Strategy

Project: LOA Gateway – Kidlington

Project No. 2256

1. Introduction

1.1. This note has been prepared to provide an overview of how the foul and surface water drainage for the new LOA Gateway development at London Oxford Airport, Langford Lane, Kidlington, OX5 1RA is to be addressed in order to achieve the objectives of providing a sustainable drainage solution, taking account of the requirements of The Sustainable Drainage System (SuDS) Policy.

1.2. A number of key objectives have been identified in researching the Policies for Development in Cherwell; as set out in the Final adopted Local Plan 2011-2031, in particular Policy ESD 7: Sustainable Drainage Systems (SuDS).

1.3. Policy ESD 7 calls for Sustainable Drainage Systems where potential flooding and pollution risks from surface water can be reduced by reducing the volume and rate of water entering the sewerage system and watercourse.

1.4. Taking the requirements as set in the LLFA County Response_22-03441-PREAPP the proposed scheme will adopt the SuDS philosophy and concepts as referenced within the Oxfordshire guidance, which in turn are based upon and derived from the CIRIA SuDS Manual (C753).

1.5. A copy of the LLFA County Response_22-03441-PREAPP and The Cherwell Local Plan 2011 – 2031 are appended to the statement.

1.6. A copy of the Flood Risk Assessment Ref. JSP-JBAU-XX-XX-RP-HM-0001-S3-P01-Flood_Risk_Assessment_combined is also appended to this note.

2. Existing Site

2.1. The existing site is a previously developed brownfield site within the demise of London Oxford Airport. Its previous use served as Hangarage for Aircraft, Offices, Flying Training School and car parking.

2.2. The site is bounded by Langford Lane to the South and The Boulevard to the East.

2.3. The site currently drains from the North West towards the South East via an existing surface water drainage network discharging to Thames Water MH Ref. 6905 as indicated on CCL Drg No. 2256-102 - Surface Water Drainage Layout (A1) located in the highway off Langford Lane to the approach to The Boulevard.

3. Foul Water Drainage

3.1. The existing foul drainage will be modified to suit the proposed foul water drainage strategy shown on the accompanying CCL Drg No. 2256-101 - Foul Drainage Layout (A1).

3.2. The foul water discharge from the new development will be fed via a modified on-site gravity pipe system which outfalls to the existing Thames Water system located in The Boulevard. Peak flows are calculated at 10.0 l/s.

3.3. The existing pumped foul water main from Hangar 14, the Volare facility, will be accommodated within the modifications for the new works. The pumped main discharges to an existing manhole to the South West corner of proposed Building C and further discharges from this point to MH Ref. 691A which is the proposed connection point for the new development.

4. Surface Water Drainage

4.1. The National Planning Policy Framework (NPPF) requires that new developments do not increase flood risk by reducing the current flood storage capacity of a site or increase storm water runoff from a site. It is the intention that the design for the development attenuates surfaces water discharge to limit flows equal to those of the existing development inclusive of the effects of climate change. Sustainable Urban Drainage (SuDS) are the most sustainable method of achieving this and may also offer the opportunity for betterment.

4.2. As part of the planning process, the feasibility of integrating various SuDS techniques is being formed by an appraisal of the existing information, namely site surveys, topographical surveys, flood risk assessment and the underlying ground conditions/geology.

4.3. SuDS are the preferred approach to managing rainfall runoff generated from impermeable surfaces and these will be employed as a key sustainable feature of the new development at the LOA Gateway. SuDS can be used to reduce the rate and volume of surface water discharging from developments to the receiving environment (e.g. Natural watercourses and public sewer network), reducing demand on the network, mitigating overwhelming the systems and in turn reducing flood risk.

4.4. A benefit of utilising a SuDS is the removal of pollutants, improving water quality, maintaining recharge to groundwater and providing a natural amenity and green space within a development while enhancing biodiversity.

4.5. There are various SuDS techniques that are available. Two techniques have been identified as suitable for this development and operate on two main principles:

- Infiltration; and
- Attenuation.

4.6. Infiltration SuDS rely on discharging to ground, where suitable ground conditions allow. Infiltration methods include the use of permeable paving under roadways and parking areas, infiltration trenches, soakaways and other techniques that are generally located below ground such as geo cellular systems. Their effectiveness depends on the soakage potential of the underlying geology.

4.7. A borehole prognosis report has been commissioned by Nicholls Licensing and Consulting which determines soakaways are likely to be un-effective for this development due to a low, un-reliable infiltration potential. It is therefore expected that below ground geo-cellular attenuation will be introduced.

4.8. The proposed surface water drainage strategy is indicated on CCL Drg Nos. 2256-103 - Surface Water Drainage Strategy - External Paving (A1) and 2256-102 - Surface Water Drainage Layout (A1).

4.9. Taking cognisance of Appendix G of the County Council's Guidance, which sets out that under the new guidance, for development with a design life to 2060-2115, Oxfordshire County Council (OCC) expects that all developers should design the surface water attenuation on site to accommodate upper end +40% climate change allowance.

4.10. This surface water drainage strategy proposes to provide capacity by means of below ground attenuation and to restrict the rate of discharge to the existing Thames Water MH Ref. 6905 to 5 l/s for up to 1 in 100-year critical storm return providing at least a 40% allowance for climate change. The restricted discharge will be controlled by either a hydrobrake or pumped chamber located within the site boundary at the point before final discharge to MH Ref. 6905.

4.11. In conjunction with below ground storm water attenuation, further attenuation volume will be provided in the form of permeable paving under the proposed road and paving areas. These will include a proprietary SuDS paving system comprising concrete block paviours over perforated macadam over a suitable depth of open graded granular fill. To slow the flow of water through the permeable pavements and to maximise the storage potential, attenuation check dams with control pipes / openings can be introduced and be located within the aggregate layers of the pavement / road make-ups.

4.12. Surface water runoff from the roof areas of the proposed development will be collected via a network of vertical downpipes which either discharge to the permeable paving or connection into the attenuated piped system. Flow diffuser chambers can be introduced to avoid erosion of the aggregate layers.

5. Appendices

5.1. LLFA County Response_22-03441-PREAPP

Application No: 22/03441/PREAPP
Location: New Science Park Land West Of The Junction With The Boulevard, Oxford Airport, Langford Lane, Kidlington

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Lead Local Flood Authority

Detailed comments:
The Sustainable Drainage Systems (SuDS) Policy, which came into force on the 6th April 2015 requires the use of sustainable drainage systems to manage runoff on all applications relating to major development. As well as dealing with surface water runoff, they are required to provide water quality, biodiversity and amenity benefits in line with National Guidance. The Sustainable Drainage Systems (SuDS) Policy also implemented changes to the Town and Country Planning (Development Management Procedure) (England) Order 2010 to make the Lead Local Flood Authority (LLFA) a statutory Consultee for Major Applications in relation to surface water drainage. This was implemented in place of the SuDS Approval Bodies (SAB's) proposed in Schedule 3 of the Flood and Water Management Act 2010.

All full and outline planning applications for Major Development must be submitted with a Surface Water Management Strategy. A site-specific Flood Risk Assessment (FRA) is also required for developments of 1 hectare or greater in Flood Zone 1; all developments in Flood Zones 2 and 3 or in an area within Flood Zone 1 notified as having critical drainage problems; and where development or a change of use to a more vulnerable class may be subject to other sources of flooding.

Further information on flood risk in Oxfordshire, which includes access to view the existing fluvial and surface water flood maps, can be found on the Oxfordshire flood tool kit website. The site also includes specific flood risk information for developers and Planners.

The National Planning Policy Framework (NPPF), which was updated in July 2021 provides specific principles on flood risk (Section 14, from page 45). National Planning Practice Guidance (NPPG) provides further advice to ensure new development will come forward in line with the NPPF.

Paragraph 159 states; "*Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere."*

As stated in Paragraph 160 and 161 of the NPPF, we will expect a sequential approach to be used in areas known to be at risk now or in the future from any form of flooding.

The Non-statutory technical Standards for sustainable drainage systems were produced to provide initial principles to ensure developments provide SuDS in line with the NPPF and NPPG. Oxfordshire County Council have published the "Local Standards and Guidance for Surface Water Drainage on Major Development in Oxfordshire" to assist developers in the design of all surface water drainage systems, and to support Local Planning Authorities in considering drainage proposals for new development in Oxfordshire. The guide sets out the standards that we apply in assessing all surface water drainage proposals to ensure they are in line with National legislation and guidance, as well as local requirements.

The SuDS philosophy and concepts within the Oxfordshire guidance are based upon and derived from the CIRIA SuDS Manual (C753), and we expect all development to come forward in line with these principles.

In line with the above guidance, surface water management must be considered from the beginning of the development planning process and throughout – influencing site layout and design. The proposed drainage solution should not be limited by the proposed site layout and design.

Wherever possible, runoff must be managed at source (i.e. close to where it falls) with residual flows then conveyed downstream to further storage or treatment components, where required. The proposed drainage should mimic the existing drainage regime of the site. Therefore, we will expect existing drainage features on the site to be retained and they should be utilised and enhanced wherever possible.

Although we acknowledge it will be hard to determine all the detail of source control attenuation and conveyance features at an outline stage, we will expect the Surface Water Management Strategy to set parameters for each parcel/phase to ensure these are included when these parcels/phases come forward. Space must be made for shallow conveyance features throughout the site and by also retaining existing drainage features and flood flow routes, this will ensure that the existing drainage regime is maintained, and flood risk can be managed appropriately.

Officer's Name: Nagina Bawar
Officer's Title: Senior LLFA Engineer
Date: 09/12/2022

5.2. The Cherwell Local Plan 2011 – 2031 [extract pages 99 -101]

Location	Site Specific FRA Requirement
Wherever applicable	Where a site is in close proximity of the Oxford Canal, the Level 3 FRA should include breach analysis.
Wherever applicable	Flood defended areas will require a FRA to include assessment of risk from catastrophic failure of defences.
Banbury	A detailed level 3 FRA is required for development within the River Cherwell Floodplain to include flood compensation. Groundwater risk to be highlighted at Crouch Hill.
North East Bicester	A level 2 FRA using existing data can be applied.
South East Bicester	A level 3 FRA including hydraulic modelling will be required in the vicinities of these watercourses.
Kidlington	Where EA modelled data is available a level 2 FRA can be completed using existing modelled flood levels. Where no data is available a Level 3 FRA including hydraulic modelling may be required for sites in close proximity to the Rowell Brook or the River Cherwell. A level 2 FRA to include detailed assessment of groundwater flood risk should be included at all sites.
Rural Areas	There are village specific recommendations contained in the SFRA

B.213 Additional recommendations are included in the Level 2 SFRAs for the proposed strategic site allocations.

B.214 We will work actively with the Environment Agency, the Local Lead Flood Authority, other operating authorities and stakeholders to ensure that best use is made of their expertise and so that spatial planning supports existing flood risk management policies and plans, River Basin Management Plans and emergency planning.

Policy ESD 7: Sustainable Drainage Systems (SuDS)

B.215 Policy ESD 7 sets out the Council's approach to Sustainable Drainage Systems (SuDS). Potential flooding and pollution risks from surface water can be reduced by reducing the volume and rate of water entering the sewerage system and watercourses. Managing drainage more sustainably in this way can ensure that developments are better adapted to the predicted impacts of climate change in the South East, which include more intense rainfall events. Policy ESD 7 is supported by the Flood and Water Management Act 2010

which presumes that SuDS will be used for all new developments and redevelopments in order to prevent surface water run-off from increasing flood risk, and sets out that national standards be published to address SuDS design, construction, operation and maintenance issues at a national level.

B.216 SuDS seek to manage surface water as close to its source as possible, mimicking surface water flows arising from the site prior to the proposed development. Typically this approach involves a move away from piped systems to softer engineering solutions. SuDS are considered to be suitable for use in association with developments across the District. Where site specific Flood Risk Assessments are required to be submitted to accompany development proposals these should be used to investigate how SuDS can be used on particular sites and to design appropriate systems.

B.217 In considering SuDS solutions, the need to protect ground water quality must be taken into account, especially where infiltration techniques are proposed. Where possible, multiple benefits including for recreation and wildlife should be delivered. Proposals must include an agreement on the future management, maintenance and replacement of the drainage structures.

B.218 All relevant organisations should meet at an early stage to agree on the most appropriate drainage system for the particular development. These organisations may include the Local Authority, the Sewage Undertaker, Oxfordshire County Council as the LLFA and Highways Authority, and the Environment Agency. Highways SuDS will be adopted by Oxfordshire County Council but must be located on the most appropriate land, requiring consideration of the need to provide access for maintenance purposes, and topographical factors. Non-highway SuDS draining two properties or more will be adopted by the Local Lead Flood Authority (LLFA) after Schedule 3 of the 2010 Act comes into force.

B.219 Advice on SuDS and their various techniques is provided in the Council's Level 1 SFRA (August 2008). All areas of the District are suitable for SuDS in one form or another but the SFRA contains maps of a range of geological and ground condition data which can be used to identify the general permeability of the underlying ground conditions (bedrock, superficial deposits and soil) and the vulnerability of the groundwater resources (aquifers), to determine which SuDS system might be suitable. However the SFRA's mapping of SuDS opportunity does not provide a detailed and definitive investigation at site specific level, and so further assessment may be required to further investigate SuDS opportunities on individual sites. The Level 2 SFRAs contain additional guidance relating to the use of SuDS on the proposed strategic site allocations.

Policy ESD 7: Sustainable Drainage Systems (SuDS)

All development will be required to use sustainable drainage systems (SuDS) for the management of surface water run-off.

Where site specific Flood Risk Assessments are required in association with development proposals, they should be used to determine how SuDS can be used on particular sites and to design appropriate systems.

In considering SuDS solutions, the need to protect ground water quality must be taken into account, especially where infiltration techniques are proposed. Where possible, SuDS should seek to reduce flood risk, reduce pollution and provide landscape and wildlife benefits. SuDS will require the approval of Oxfordshire County Council as LLFA and SuDS Approval Body, and proposals must include an agreement on the future management, maintenance and replacement of the SuDS features.

Our Core Assets

Policy ESD 8: Water Resources

B.220 In considering development proposals, the Council will use Policy ESD 8 together with 'Policy ESD 3: Sustainable Construction', 'Policy ESD 6: Sustainable Flood Risk Management' and 'Policy ESD 7: Sustainable Drainage Systems' (SuDS) to reduce the impact of development on the water environment, maintain water quality, ensure adequate water resources and promote sustainability in water use. This will assist in contributing to the objectives of the Water Framework Directive which seeks to protect and enhance the quality of water bodies, and indicates that development should not result in any deterioration in the status of surface water bodies. Some development can remediate contaminated land which may be having an adverse impact on controlled water and human health. These policies together with Policy ESD 8 are also intended to help deliver the actions contained in the Thames River Basin Management Plan. These actions highlight the importance of development proposals contributing to an improved water environment, through the use of sustainable design and construction techniques for water efficiency, water quality and sustainable flood management, and the incorporation of appropriate green infrastructure and biodiversity improvements.

5.3. Flood Risk Assessment Ref. JSP-JBAU-XX-XX-RP-HM-0001-S3-P01 Flood_Risk_Assessment_combined

London Oxford Airport Science Park - Flood Risk Assessment

Final Report

February 2023

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Contract

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This report describes work commissioned by Civils Contracting Ltd, by an instruction dated 05 January 2023. The Client's representative for the contract was Dave Toone of Civils Contracting Ltd.

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Abbreviations

AEP ..... Annual Exceedance Probability
BGS ..... British Geological Survey
CFMP ..... Catchment Flood Management Plan
DTM ..... Digital Terrain Model
EA ..... Environment Agency
FRA ..... Flood Risk Assessment
LiDAR ..... Light Detection And Ranging
NGR ..... National Grid Reference
NPPF ..... National Planning Policy Framework
OS ..... Ordnance Survey
OS NGR ..... Ordnance Survey National Grid Reference
PPG ..... Planning Policy Guidance
SFRA ..... Strategic Flood Risk Assessment

Executive Summary

Background and site context

JBA Consulting were commissioned by Civils Contracting Ltd in January 2023 to undertake a Flood Risk Assessment (FRA) and prepare a detailed surface water drainage strategy and an outline foul water drainage strategy for the London Oxford Airport Science Park development.

This report contains the FRA only, whereas the drainage strategies are contained in a separate report.

The proposed site is located on the south-east corner of London Oxford Airport. The existing 3.5ha site was occupied by London Oxford Airport facilities, including seven buildings in commercial use, access roads and parking areas. Some of the existing buildings have already been demolished in preparation for redevelopment.

The proposed development comprises a Science Park, including five modern two-storey commercial units, including laboratories, and associated road and parking infrastructure and landscaping.

The British Geological Survey data indicates that the site is underlain by sedimentary bedrock (such as limestone, bioclastic wackestone and packstone). Overlying sedimentary superficial deposits of sands and gravels are present. Borehole information confirms that the deposits comprise of Great Oolite Group and Inferior Oolite Group.

The closest watercourse to the proposed site is approx. 340m to the east (unnamed ordinary watercourse). Oxford Canal and River Cherwell, main river, are located further to the east. Another ordinary watercourse, Rowel Brook, is located to the west of A44, Woodstock Road.

Flood risk

- The Environment Agency's Flood Map for Planning indicates that the proposed site is within Flood Zone 1, and thus at 'very low' risk of flooding from fluvial sources. Furthermore, there are no indications that the site has flooded in the past from any fluvial sources.
- Groundwater flood risk is widely affecting the north west of Kidlington, however, it is unlikely to significantly affect the proposed site due to encountered low groundwater levels, thus the risk of groundwater flooding has been assessed as 'low'.
- The Environment Agency's Risk of Flooding from Surface Water mapping indicates that only localised surface water flooding affects parts of the site, mainly due to topographical depressions and configuration of the existing

buildings. There are no overland flow routes through the site. The risk of surface water flooding is therefore considered 'low'.

- The site is considered at low risk of flooding from sewers.
- Based on the Environment Agency's 'Risk of Flooding from Reservoirs' dataset the site is not at risk of flooding from reservoirs during either a dry day or wet day scenario.
- The site is not at risk of flooding from the Oxford Canal and any other artificial sources.
- In the unlikely event of a flood, safe and dry access will be available to and from all areas of the proposed site via the entrance and exit route of site.

Recommendations

It is recommended that:

- Finished Floor Levels (FFL) and openings (e.g. air bricks) of the proposed buildings should be set to a minimum of 150mm above the finished surrounding ground levels. It is recommended that the surface water drainage system of the site and the finished floor levels of the properties should be designed with care regarding the appropriate requirements for exceedance flows and appropriate allowances for freeboard.
- The surface water runoff originating within the redeveloped site is managed using SuDS techniques and the finished floor levels of the buildings should be designed with care regarding the appropriate requirements for exceedance flows and appropriate allowances for freeboard.

1 Introduction

1.1 Terms of reference

JBA Consulting were commissioned by Civils Contracting Ltd in January 2023 to undertake a Flood Risk Assessment (FRA) and prepare a detailed surface water drainage strategy and an outline foul water drainage strategy for a new development London Oxford Airport Science Park.

This report contains the FRA only, whereas the drainage strategies are contained in a separate report.

This FRA provides information on all aspects of flood risk pertaining to the site in accordance with the revised National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG) relating to development and flood risk. It also considers the flood risk mitigation relevant to the nature of the proposed development and the Flood Zone classification of the site.

The flood risk to and from the site has been determined from publicly available information and information provided by the client, such as topographical surveys and site investigations.

1.2 FRA requirements

It is a requirement for development applications to consider the potential risk of flooding from various sources to a proposed development over its lifetime and any possible impacts on flood risk elsewhere as a result of the development.

Where appropriate, the following aspects of flood risk should be addressed and the extent to which the development is designed to deal with flood risk:

- the nature and expected lifetime of the development and the extent to which the development is designed to deal with flood risk;
- the area liable to flooding from various sources;
- the probability of the current and future flood risk;
- the extent and standard of existing flood defences and their effectiveness over time;
- the likely depth of flooding;
- the rates of predicted flows;
- the likelihood to impacts on other areas, properties, and habitats; and
- the effects of climate change.

The level of flood risk to the site has been determined based on open license flood risk datasets provided on the Defra Data Services website by the Environment Agency. This includes the Flood Map for Planning, LIDAR Digital Terrain Model (DTM) and flood history datasets.

2 Study Area

2.1 Existing site

The proposed development is located on the south-east corner of London Oxford Airport, which is located to the north east of Kidlington, OX5 1RA. The existing 3.5ha site was occupied by London Oxford Airport facilities, including seven buildings in commercial use, access roads and parking areas. Some of the existing buildings have already been demolished in preparation for redevelopment.

The site is bounded by airport facilities to the north and west, the Boulevard to the east and Langford Lane to the south.

The site location plan and site details are included in Table 2-1 and Figure 2-1.

Table 2-1: Summary of site details

Site Name	Science Park
Site area	London Oxford Airport
Existing site use	Offices and commercial
OS NGR	SP 47605 14923
County	Oxfordshire
Country	England
Local Planning Authority	Cherwell District Council
Lead Local Flood Authority	Oxfordshire County Council
Sewerage Undertaker	Thames Water

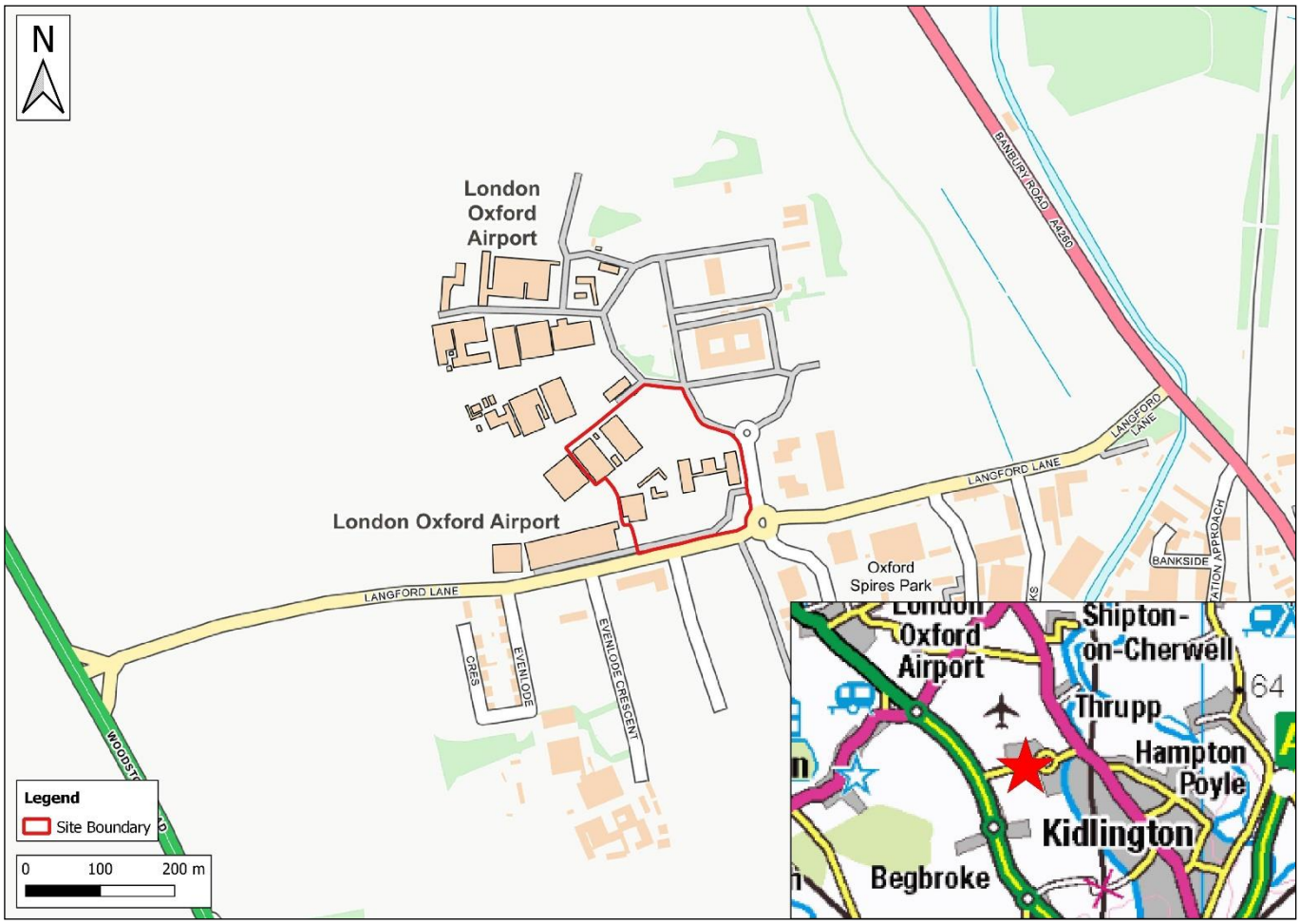


Figure 2-1: Site location plan

2.2 Proposed development

The proposed development is for a Science Park. This includes the re-development of the entrance area to London Oxford Airport, demolition of the existing buildings and construction of five modern two-storey commercial units, including laboratories, and associated road and parking infrastructure and landscaping.

The proposed development layout is shown in Appendix A.

2.3 Topography

A site-specific topographic survey was undertaken by KND Surveys Ltd, this is included as Appendix B. The survey indicates that ground levels fall between 72.97m above ordnance datum (AOD) and 71.12m AOD. Land is shown to be generally flat and slopes from the northwest to southeast direction.

The Environment Agency's (EA's) 2020 LiDAR DTM dataset has also been used to provide a topographical visualisation of the wider area and is shown in Figure 2-2.

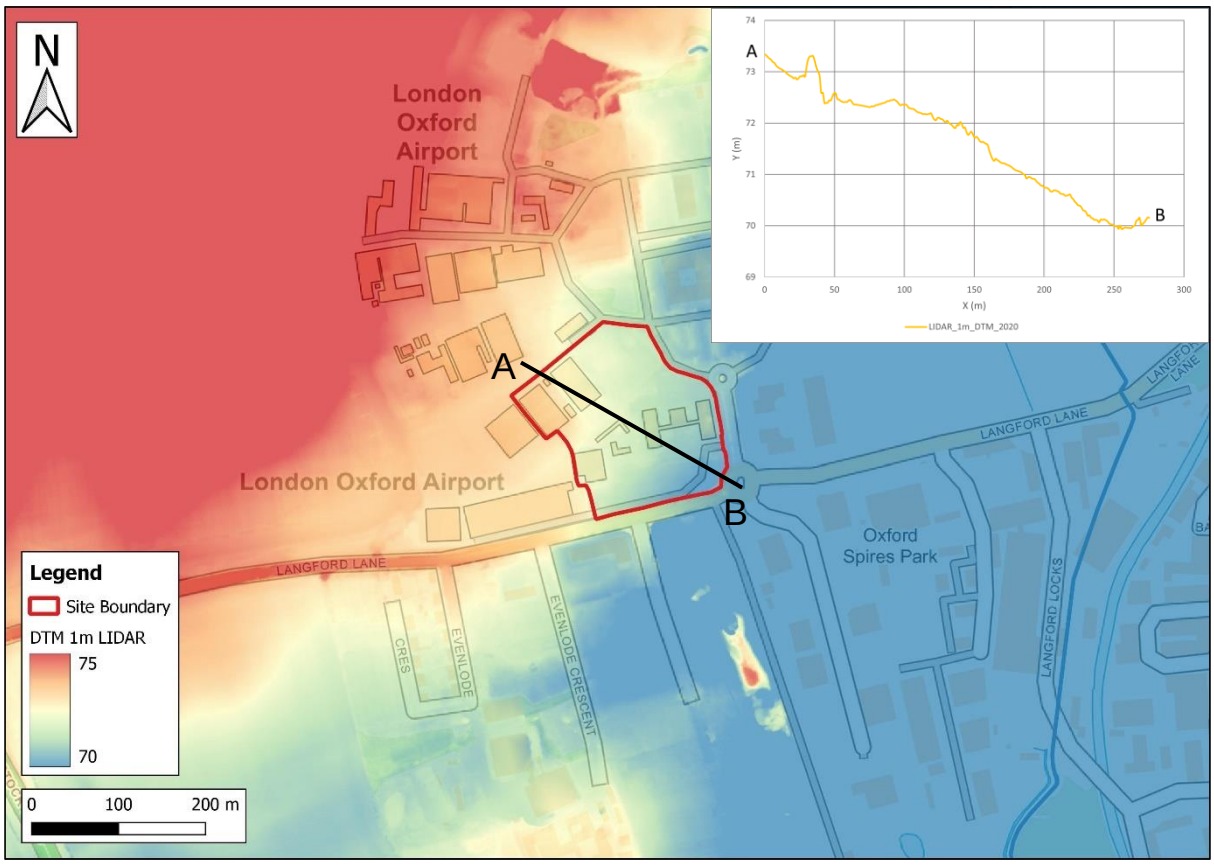


Figure 2-2: LiDAR Digital Terrain Model

2.4 Geology

British Geological Survey (BGS)[1] data indicates that the site is underlain by sedimentary bedrock (such as limestone, bioclastic wackestone and packstone). Overlying sedimentary superficial deposits of sands and gravels are present. The deposits consist of Great Oolite Group and Inferior Oolite Group.

2.5 Hydrogeology

Hydrogeological information was obtained from the online Magic Maps service[2]. These maps indicate that the site is underlain by a Great Oolite Group and Inferior Oolite Group superficial aquifers. Groundwater levels can vary seasonally within the aquifer (Allen et al., 1997)[3].

The maps also indicate that the site is underlain by a Cornbrush Formation bedrock aquifer with Soluble Rock Risk which has 'freely draining slightly acid but base-rich soils'.

The site is not located within a Source Protection Zone (SPZ). The site is within a Nitrate Vulnerable Zone which could result in vulnerability of the aquifer to pollutants discharged at the surface.

A site investigation was undertaken by Southern Testing Ltd in March 2017, this confirmed that groundwater levels (recorded in February 2017) is approximately 6-10 meters below ground level as the ground level is approx. 70.8 - 73.5mAOD. This is consistent with historic records from the BGS which struck groundwater at 70 - 73m AOD and indicated resting water levels at approx. 60 - 67mAOD4.The resting water level was measured in March 1941 and was at 60.2mAOD.

1 BGS Geology of Britain viewer: www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/

2 DEFRA Magic Maps https://magic.defra.gov.uk/magicmap.aspx

3 Allen, DJ., Brewerton, LJ., Coleby, LM., Gibbs, BR., Lewis, MA., MacDonald, AM., Wagstaff, SJ., and Williams, AT (1997) The physical properties of major aquifers in England and Wales. British Geological Survey Technical Report WD/97/34. Environment Agency R&D Publication 8

4 Local Flood Risk Management Strategy www2.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/environmentandplanning/flooding/OxfordshireFloodRiskManagementStrategy.pdf

2.6 Watercourses

Environment Agency mapping has been used to identify the locations of watercourses within and around the development site.

The nearest main river is an unnamed watercourse and its tributary some 340m east of the site. It runs parallel to the Oxford Canal, that lies approximately 570m east to the proposed site. The River Cherwell is a main river located approximately 1.2km away from the site.

There is also Rowel Brook, an ordinary watercourse, to the west of Woodstock Road.

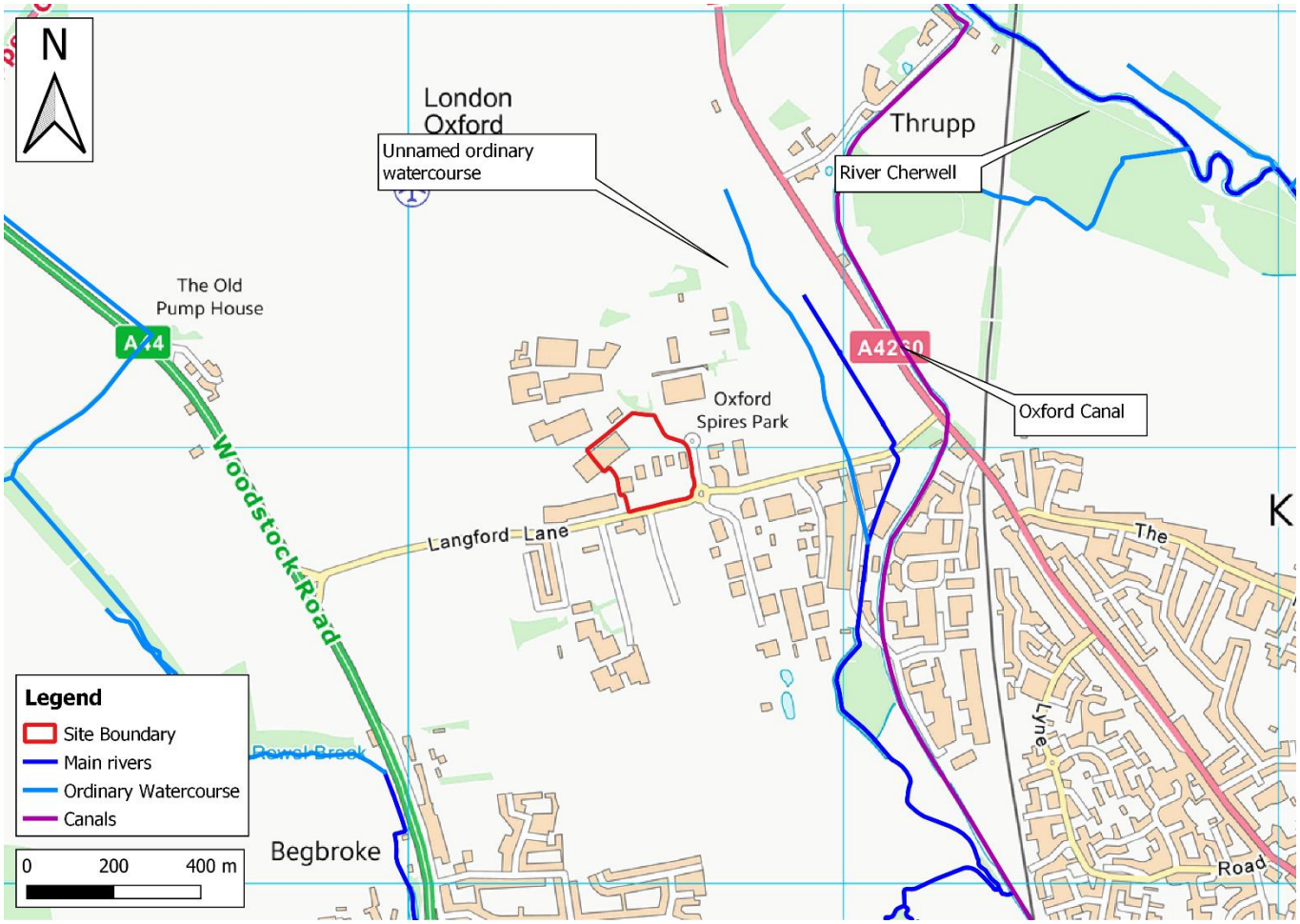


Figure 2-3: Surrounding watercourses

3 Planning Policy and Flood Risk

3.1 Planning context

The NPPF was introduced by the Department for Communities and Local Government in March 2012. The NPPF was revised a number of times since, with the latest update made in July 2021. The revised NPPF considers flood risk to developments using a sequential characterisation of all sources of flood risk, based on planning zones and the EA Flood Map. The revised NPPF is supported by the PPG, originally published in March 2014, and last updated in August 2022, which gives additional information on the assessment of flood risk. The main study requirement is to identify the flood zones and vulnerability classification relevant to the proposed development, based on an assessment of current and future conditions.

3.2 Development sites in flood zones

The EA states that the flood risk is a function of:

- "The likelihood of a particular flood happening, best expressed as a chance or probability over a period of one year. For example, 'There is a 1 in 100 chance of flooding in any given year in this location'.
- "The impact or consequences that will result if the flood occurs."

The EA has developed a Flood Map which shows the risk of flooding in England for different return period events, assuming no flood defences. This map provides the basis for the assessment of flood risk and development suitability under the NPPF. This map is divided into flood zones which indicate the probability of flooding that land in each zone has, as outlined in Table 3-1.

Table 3-1: Flood Zone classifications

Flood Zone	Definition
Zone 1: Low Probability	Land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1% AEP).
Zone 2: Medium Probability	Land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1% AEP) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1% AEP) in any year.
Zone 3a: High Probability	Land assessed as having a 1 in 100 or greater probability of river flooding (>1% AEP) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP) in any year.

Flood Zone	Definition
Zone 3b: Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.

3.3 Sequential and exception tests

The NPPF requires that the Sequential and Exception Tests be applied when choosing the location of new development and the layout of the development site. The Sequential Test aims to promote development in low flood risk areas (Flood Zone 1). The Exception Test is used where no suitable development areas can be found in low-risk zones.

The Sequential Test should be applied to identify suitable sites which are at low risk from all sources of flooding, avoiding medium and high-risk areas where possible. If no suitable areas can be identified in low-risk areas, then sites with the lowest flood risk should be considered next. If development is necessary within a medium or high-risk zone, an exception test may be required to demonstrate the need for the development in that location and plans to mitigate the flood risk. The requirement for the application of the Exception Test is outlined in Section 3.4 below.

3.4 NPPF and PPG flood vulnerability and flood zone incompatibility

Table 3-1 shows how Flood Zones are defined (as based on Table 1 of the PPG). Annex 3 of the NPPF shows the classification of flood risk vulnerability in relation to a proposed development type. Table 3-2 (reproduced from Table 2 of the PPG) shows the compatibility of these flood zones and vulnerability classifications.

The proposed development will consist of a Science Park (commercial) which is classified as ‘less vulnerable’ under the NPPF. This classification of development is

considered compatible with Flood Zone 1, and application of the Exception Test is not required, as shown in Table 3-2.

Table 3-2: Flood risk vulnerability and flood zone 'incompatibility'

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test Required	✓	✓	✓
Zone 3a	Exception Test Required	X	Exception Test Required	✓	✓
Zone 3b	Exception Test Required	X	X	X	✓

Notes:
✓ Exception Test is not required
X Development should not be permitted.

3.5 Climate change allowances

The NPPF and supporting PPG on Flood Risk and Coastal Change explain when and how flood risk assessments should be used. This includes demonstrating how flood risk will be managed now and over the development's lifetime, taking climate change into account.

On 19 February 2016, the EA released new guidance on climate change allowances to support the NPPF. The guidance was last updated on 27 May 2022. The climate changes allowances are predictions of anticipated changes for the following:

- peak river flow allowances for each river basin district;
- peak rainfall intensity;
- sea level rise; and
- offshore wind speed and extreme wave height.

3.5.1 Peak river flows

The guidance provides advice on which peak river flow allowances, based on river basins, should be used for FRAs for sites in all Flood Zones.

As the proposed development is for a commercial use, the lifetime of the development is considered to be a minimum of 75 years and therefore the central climate change

allowance for the 2080s epoch (2070– 2115) has been considered using the DEFRA Climate Change Allowances[5].

In the Gloucestershire and the Vale Management Catchment, this equates to an allowance of 26% as shown in Table 3-3 for this particular site. The 1 in 100-year event plus climate change is also known as the design flood. It should be noted that consideration of peak river flows will not be required at this site as the site is not at risk of fluvial flooding.

Table 3-3: Peak river flow allowances for the Gloucestershire and the Vale Management Catchment

Allowance	Total anticipated for the 2020s (2015-2039)	Total potential change anticipated for the 2050s (2040-2069)	Total potential change anticipated for the 2080s (2070-2115)
Central	11%	11%	26%
Higher central	17%	19%	41%
Upper end	33%	43%	84%

3.5.2 Peak rainfall intensities

Peak rainfall intensity allowances must also be considered and are applicable to surface water drainage design or surface water modelling studies. The lifetime of the proposed development is considered to be 75 years and therefore the central and upper end climate change allowances for the 2070s epoch (2061– 2125) has been considered.

In the Gloucestershire and the Vale Management Catchment, this equates an allowance of 40%, as shown in Table 3-4 for peak rainfall intensity in the 1 in 100-year event.

Table 3-4: Peak rainfall allowances for the Gloucestershire and the Vale Management Catchment

Allowance 1% AEP	Total potential change anticipated for the 2050s (2040-2060)	Total potential change anticipated for the 2070s (2061-2125)
Central	20%	40%
Upper end	25%	40%

5 DEFRA Climate Change Allowances environment.data.gov.uk/hydrology/climate-change-allowances/rainfall?mgmtcatid=3038

3.6 Policy review

3.6.1 Local Plan

The Cherwell Local Plan[6] guides planning and development across Cherwell District.

The proposed development is located on previously developed land within the Green Belt and supports the aims of the Local Plan which intends to secure the growth potential from the presence of London-Oxford Airport and accommodate high value employment uses on the site. Policy ESD6 of the Local Plan discusses sustainable flood risk management and states:

- ''Site specific flood risk assessments will be required to accompany development proposals for development proposals of 1 hectare or more located in flood zone 1.
- Flood risk assessments should assess all sources of flood risk and demonstrate that there will be no increase in surface water discharge rates or volumes during storm events up to and including the 1 in 100 year storm event with an allowance for climate change (the design storm event).
- Flood risk assessments should demonstrate that developments will not flood from surface water up to and including the design storm event or any surface water flooding beyond the 1 in 30 year storm event, up to and including the design storm event will be safely contained on site".

3.6.2 Oxfordshire County Council Strategic Flood Risk Assessment

A Strategic Flood Risk Assessment (SFRA) is undertaken by the Local Planning Authority to help manage the current and future flood risks from surface water, ground water and ordinary watercourses. The current Level 1 Strategic Flood Risk Assessment[7] was published in May 2017.

The SFRA states that river flooding in Oxfordshire is significant. Historic flood events were reported which occurred throughout the whole county but affected Oxfordshire severely. Therefore, recommendations were made to improve the severity of flooding events in the county. The proposed site is located further away from any rivers, reservoirs or watercourses, therefore the risk of flooding is very low. Although, surface water flooding from rainfall events can impact the area.

The SFRA identifies the Oxford Canal and River Cherwell as being the main source of flooding in the Kidlington region and the Oxford Canal could pose a risk of flooding

6 Final Adopted Local Plan 2011-2031 (incorporating re-adopted Policy Bicester 13) https://www.cherwell.gov.uk/downloads/download/45/adopted-cherwell-local-plan-2011-2031-part-1-incorporating-policy-bicester-13-re-adopted-on-19-december-2016

7 Cherwell and West Oxfordshire Level 1 Strategic Flood Risk Assessment www.westoxon.gov.uk/media/vlspjzlm/strategic-flood-risk-assessment.pdf

and the northwest of Kidlington is known to be widely affected by groundwater flooding, although this is unlikely to impact London Oxford Airport.

3.6.3 Oxfordshire County Council Local Flood Risk Management Strategy

Oxfordshire County Council fulfils the role of the Lead Local Flood Authority (LLFA) and published a Local Flood Risk Management Strategy[8]. The strategy has been developed in partnership with the City and District Councils, the Environment Agency and Thames Water. The Oxfordshire County Council has responsibility to 'develop, maintain, apply and monitor' a flood risk management strategy. The LFRMS does not identify specific issues for the site.

3.6.4 Thames Catchment Flood Management Plan

The Thames Catchment Flood Management Plan was prepared by the Environment Agency in December 2009[9] and has been reviewed as part of this study. The CFMP highlights that the EA aim to work with natural processes and manage the probabilities and consequences of flooding. In most years, surface water flooding occurs after heavy storms.

The site falls within Policy 6 of the CFMP, this policy is defined as an area of low to moderate flood risk where the EA will take action to store water and manage run-off to reduce flood risk and to mitigate the impacts of climate change. The EA aims to work with LPAs to set policies that lead to long-term adaptation of urban areas and identify locations where the use of water catchments can benefit communities by reduction in flood risk and environmental benefits.

3.6.5 Thames River Basin Management Plans

The Thames River Basin District Management Plans, published in December 2009, highlights the importance of a sustainable water use which can later benefit the wildlife and local communities. The site falls under the Thames River Basin District which is one of the driest in the UK with annual rainfall levels[10]. The RBMP identifies that maintaining and improving the quality of groundwater is a high priority. The aim is to ensure that the watercourses achieve a 'good status'.

8 Local Flood Risk Management Strategy
www2.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/environmentandplanning/flooding/OxfordshireFloodRiskManagementStrategy.pdf

9 Thames Catchment Flood Management Plan December 2009
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/293903/Thames_Catchment_Flood_Management_Plan.pdf

10 Thames Catchment Flood Management Plan December 2009
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/293903/Thames_Catchment_Flood_Management_Plan.pdf

4 Assessment of Flood Risk

4.1 Historic flooding

The Environment Agency's Recorded Flood Outlines dataset has been reviewed for the site.

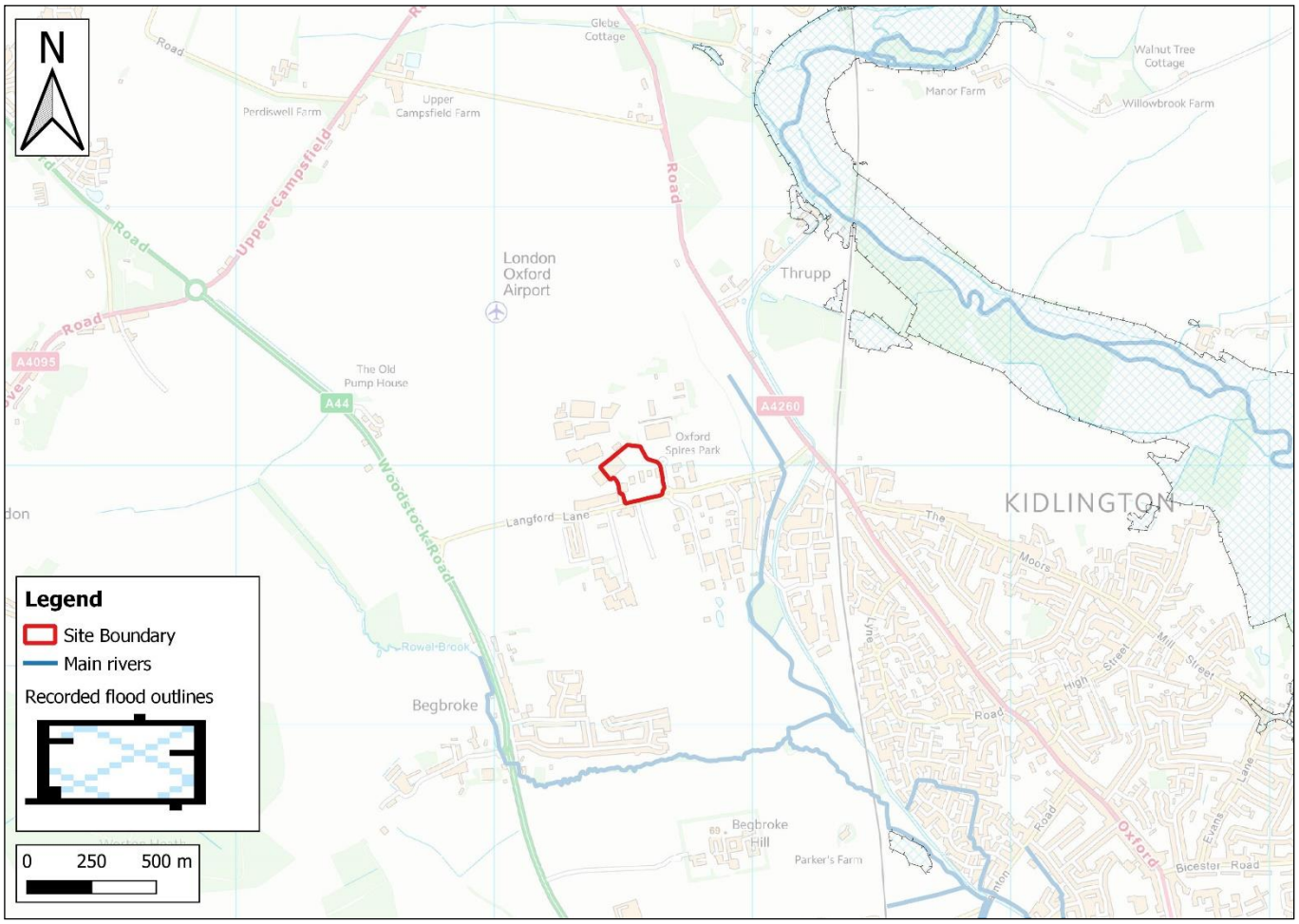


Figure 4-1 indicates that the site has not flooded historically from fluvial sources.

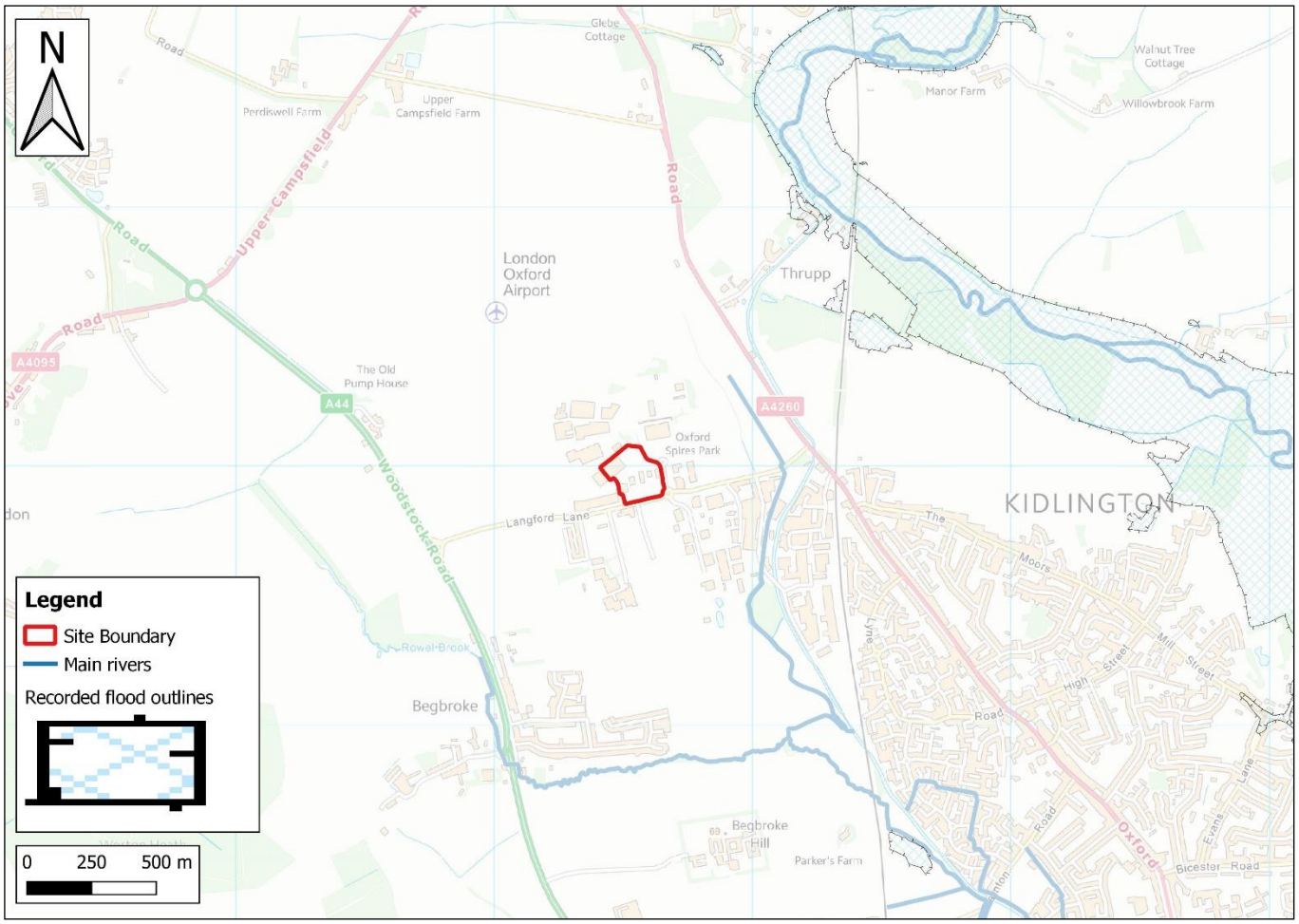


Figure 4-1: EA Recorded Flood Outlines

4.2 Fluvial flood risk

4.2.1 Flood Map for Planning

The EA Flood Map for Planning has been reviewed to assess risk of flooding from fluvial sources. This indicates that the site is within Flood Zone 1, which is land that have less than 0.1% chance of fluvial flooding annually.

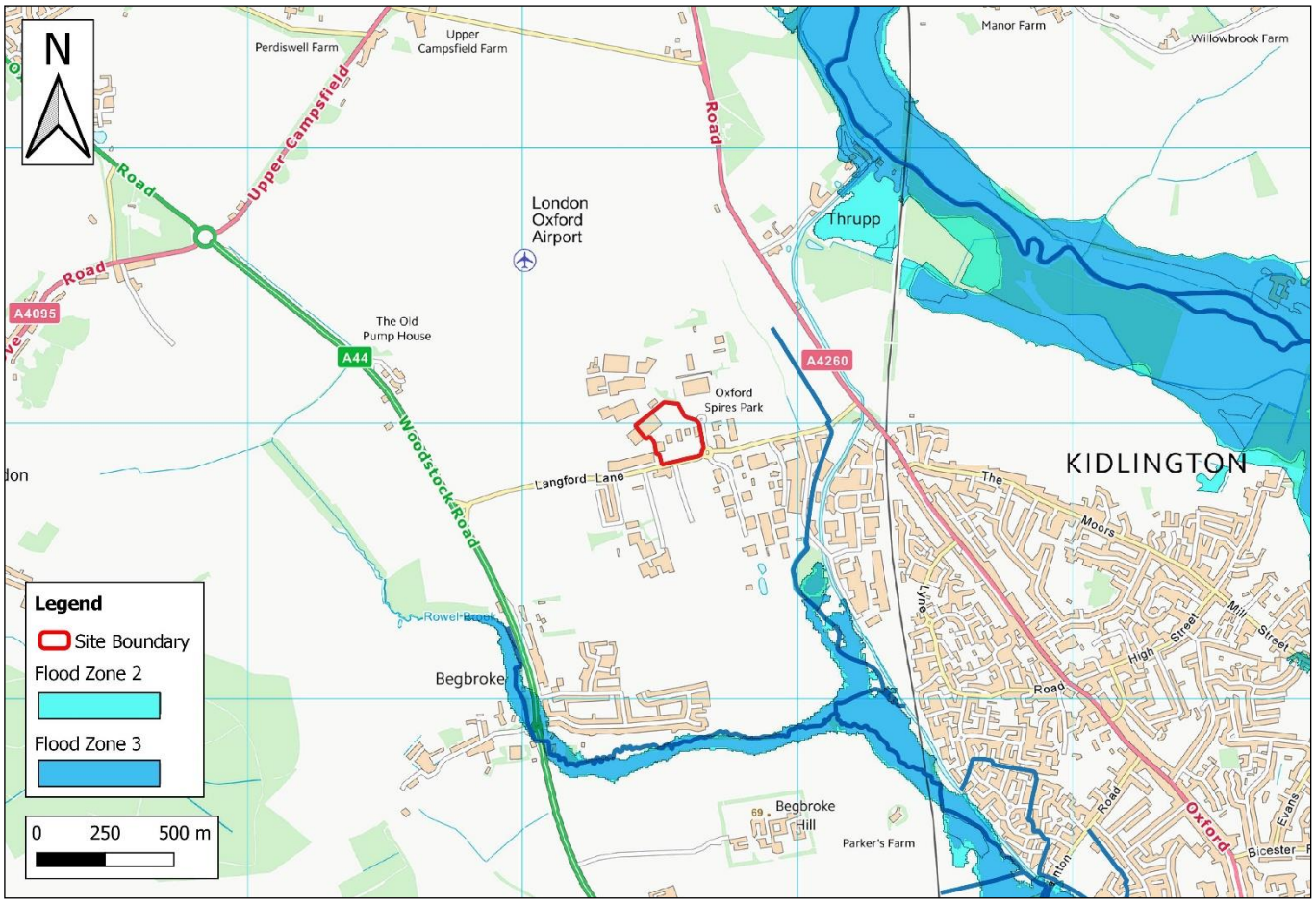


Figure 4-2: Flood Map for Planning

It should be noted that the flood modelling does not extend to the ordinary watercourse to the west of the site. Ground levels at the site and the watercourse have been assessed using the Environment Agency's 1m LIDAR DTM as follows:

- Eastern site boundary = 70.25mAOD
- Right bank of unnamed ordinary watercourse = 63.68mAOD

This indicates that there is difference of 6.57m between the lowest point of the site and the site is highly unlikely to be at risk of flooding from this watercourse. Consequently, the site is considered at 'low' risk of flooding from fluvial sources.

4.3 Surface water flood risk

Surface water flooding arises when rain falling on saturated ground flows overland, following the local topography. Overland flow can pose a risk to both the development site and land surrounding the development site. In the former case, overland flow may originate from the site itself or from adjoining land at a higher elevation from which flow migrates onto the development area. In the latter case, existing developments at a lower elevation may be subject to flooding due to overland flow originating from the site and migrating towards lower areas. The layout of the proposed development needs to reflect and, where necessary, mitigate against the risks.

The Risk of Flooding from Surface Water (RoFSW) dataset has been used to determine the potential extents of surface water flooding at the site (Figure 4-3). RoFSW mapping indicates that only small, localised areas of medium and high flood risk are present on site. There are no evident overland flow routes through the site and the ponding areas are largely due to topographical depressions and locations of particular buildings. Based on the topography, surface water also naturally ponds in the low-lying southeast corner of the site (approx. 69mAOD).

Figure 4-3: Risk of flooding from surface water mapping

Flood hazard has been reviewed for the 0.1% AEP event (Figure 4-4). This return period has been used as a proxy for climate change as no climate change modelling of the Risk of Flooding for Surface Water mapping has been made available. The hazard data indicates that most of the site has a low hazard rating (Caution) with only localised areas rated as 'danger for some'. As a result, it is highly unlikely that surface water flooding would pose a significant danger or impede access by emergency vehicles. Consequently, the site is considered to be at a low risk of surface water flooding.

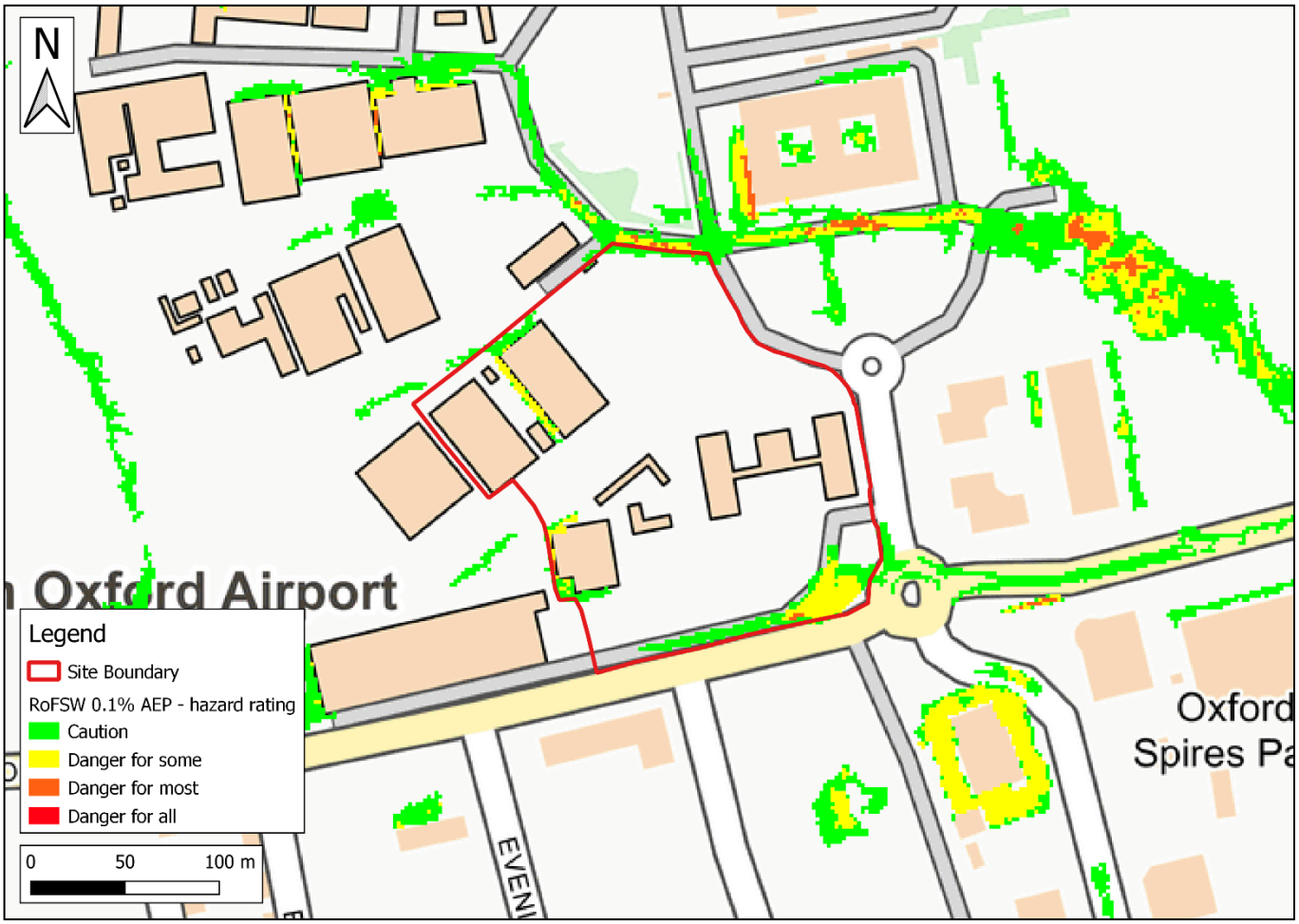


Figure 4-4: Flood hazard map of surface water flooding in a 0.1% AEP event

4.4 Groundwater flood risk

Groundwater flooding occurs when the water table rises above ground level, particularly after prolonged rainfall events. This is most likely to occur in low-lying areas that are underlain by permeable bedrock and superficial geologies. Unlike other forms of flooding, groundwater flooding does not pose a significant risk to life but can cause serious damage to property.

The site is underlain by superficial deposits comprised of sands and gravels which are considered relatively permeable, however site investigation work and historic records indicate that groundwater levels are estimated to be approximately 6-10m below ground level and recorded during February when groundwater levels would likely be high. As a result, the risk of groundwater flooding at the site is considered to be low.

4.5 Sewer flood risk

Sewer flooding can occur when drainage systems become overwhelmed by heavy rainfall or when pipes become blocked. The site is served by private surface and foul water drainage systems, which discharge to the local public sewers based on Thames

Water sewer records (Appendix C). This is currently being confirmed by on-site drainage investigation.

No information on sewer flooding events was found in the SFRA near the proposed site, and this information is often not made publicly available by water companies. Nevertheless, the road levels where the sewers can be located are at a lower elevation than the site. Consequently, the risk of sewer flooding is assessed as 'low'.

It should be noted that existing private drainage systems within the site will be made redundant and replaced with new separate surface and foul water systems designed in line with the current industry standards.

4.6 Flooding from artificial sources

The Environment Agency's 'Risk of Flooding from Reservoirs' dataset has been reviewed, this indicates that the site is not at risk of flooding from reservoirs during either a dry day or wet day scenario.

The Oxford Canal is situated approximately 600m east of the site. Ground levels at the site and the right bank of the Oxford Canal have been assessed using the Environment Agency's 1m LIDAR DTM as follows:

- Eastern site boundary = 70.25mAOD
- Right bank of Oxford Canal = 66.33mAOD

This indicates that there is a difference of 3.92m between the lowest site level and the top of the right bank of the Oxford Canal and in the unlikely event the canal was to flood, this would not affect the site. If it was to be breach, flows would be discharged to the south, along the path of the existing main river and away from the site.

5 Flood Mitigation Measures

Overall, the site is at low risk of flooding from all considered sources and it is highly unlikely that the development would result in any adverse off-site impacts. Nevertheless, the following recommendations have been made as part of this FRA.

5.1 Finished floor levels

The proposed site is not at risk of fluvial flooding, however, it is suggested that the floor levels are raised to avoid any surface water or groundwater flooding should they occur.

In line with part H of Building Regulations, the finished floor levels (FFL) and openings (e.g. air bricks) of the proposed buildings should be set to a minimum of 150mm above the surrounding finished ground levels. This is to prevent flooding from flowing or ponding storm water near doorways and other ingress routes such as vents and air bricks.

5.2 Safe access and egress

The proposed site is located within Flood Zone 1 and safe access and egress will be achievable for all sources of flooding and during all events up to and including the 0.1% AEP surface water flood event.

In the unlikely event of a flood, safe and dry access will be available to and from all areas of the proposed site via the entrance and exit route of site.

5.3 Surface water drainage

It is recommended that the surface water runoff originating within the redeveloped site is managed using SuDS techniques and that exceedance flow routing is considered.

A drainage strategy has been prepared as part of the commission and is included in a separate report.

6 Conclusions and Recommendations

6.1 Conclusions

- JBA Consulting were commissioned by Civils Contracting Ltd in January 2023 to undertake a Flood Risk Assessment (FRA) and prepare a detailed surface water drainage strategy and an outline foul water drainage strategy for the London Oxford Airport Science Park development. This report contains the FRA only, whereas the drainage strategies are contained in a separate report.
- The proposed site is located on the south-east corner of London Oxford Airport. The existing 3.5ha site was occupied by London Oxford Airport facilities, including seven buildings in commercial use, access roads and parking areas. Some of the existing buildings have already been demolished in preparation for redevelopment.
- The proposed development comprises a Science Park, including five modern two-storey commercial units, including laboratories, and associated road and parking infrastructure and landscaping.
- The British Geological Survey data indicates that the site is underlain by sedimentary bedrock (such as limestone, bioclastic wackestone and packstone). Overlying sedimentary superficial deposits of sands and gravels are present. Borehole information confirms that the deposits comprise of Great Oolite Group and Inferior Oolite Group.
- The closest watercourse to the proposed site is approx. 340m to the east (unnamed ordinary watercourse). Oxford Canal and River Cherwell, main river, are located further to the east. Another ordinary watercourse, Rowel Brook, is located to the west of A44, Woodstock Road.
- The Environment Agency's Flood Map for Planning indicates that the proposed site is within Flood Zone 1, thus at 'very low' risk of flooding from fluvial sources. Furthermore, there are no indications that the site has flooded in the past from any fluvial sources.
- The closest watercourse to the proposed site is approx. 340m away (unnamed ordinary watercourse). Flooding from this watercourse would not affect the proposed site due to difference of approximately 6.50m between the lowest point of the site and the watercourse bank levels.
- Groundwater flood risk is widely affecting the north west of Kidlington, however, it is unlikely to significantly affect the proposed site due to encountered low groundwater levels, thus the risk of groundwater flooding has been assessed as 'low'.
- The Environment Agency's Risk of Flooding from Surface Water mapping indicates that only localised surface water flooding affects parts of the site,

mainly due to topographical depressions and configuration of the existing buildings. There are no overland flow routes through the site and the hazard to people is mostly low. The risk of surface water flooding is therefore considered 'low'.

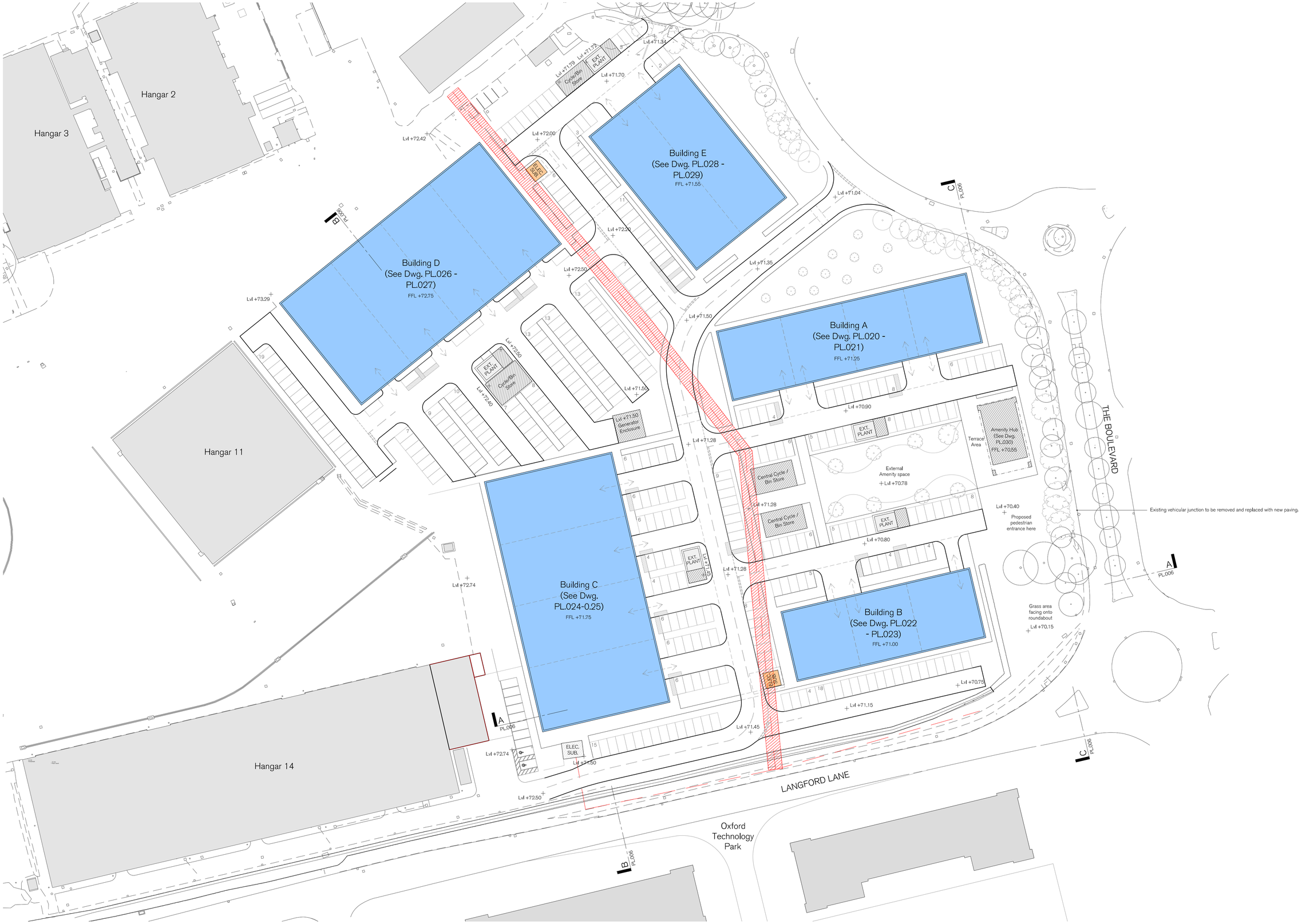
- The site is considered at low risk of flooding from sewers.
- Based on the Environment Agency's 'Risk of Flooding from Reservoirs' dataset the site is not at risk of flooding from reservoirs during either a dry day or wet day scenario.
- Ground levels at the site and the right bank of the Oxford Canal have been assessed using the Environment Agency's 1m LIDAR DTM. This indicates that there is a difference of approximately 3.90m between the lowest site level and the top of the right bank of the Oxford Canal and in the unlikely event the canal was to flood, this would not affect the site.
- In the unlikely event of a flood, safe and dry access will be available to and from all areas of the proposed site via the entrance and exit route of site.

6.2 Recommendations

It is recommended that:

- Finished Floor Levels (FFL) and openings (e.g. air bricks) of the proposed buildings should be set to a minimum of 150mm above the finished surrounding ground levels. It is recommended that the surface water drainage system of the site and the finished floor levels of the properties should be designed with care regarding the appropriate requirements for exceedance flows and appropriate allowances for freeboard.
- The surface water runoff originating within the redeveloped site is managed using SuDS techniques and the finished floor levels of the buildings should be designed with care regarding the appropriate requirements for exceedance flows and appropriate allowances for freeboard.

A Proposed development layout



1:500
0 5 15 25 50m

N

KEY:

Planning Application Boundary

Drawings based upon client supplied survey by KND Surveys LTD dated June 2017.

SPRATLEY & PARTNERS
7 CENTENARY BUSINESS PARK, STATION ROAD, HENLEY-ON-THAMES, OXFORDSHIRE RG9 1DS . 01491 411277

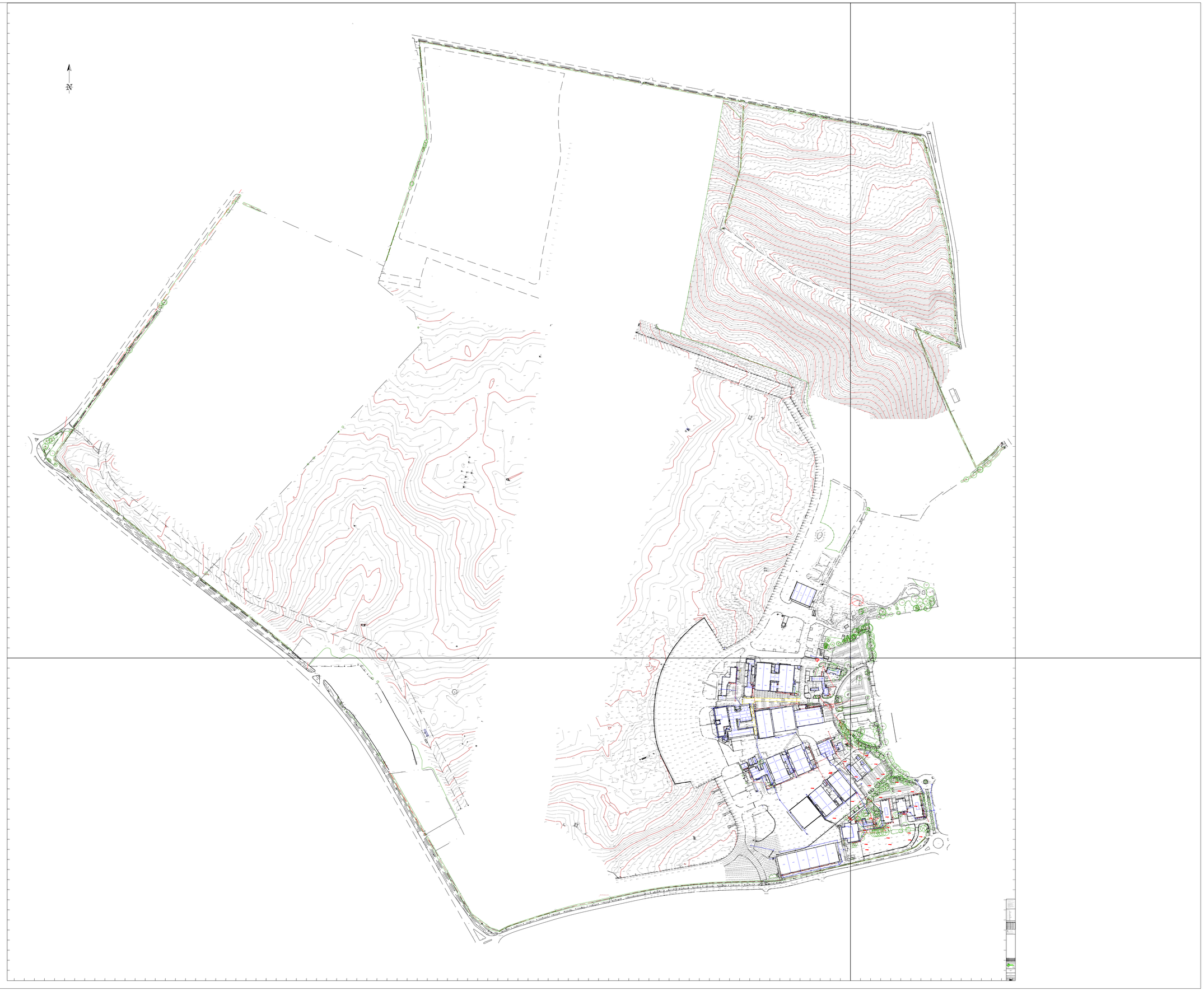
REV.	ISSUED	DESCRIPTION	DRAWN	CHECKED
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

PROJECT: Oxford London Airport
DESCRIPTION: Proposed Site Plan
CLIENT: Oxford Aviation Services LTD

DATE: July 2022
SCALE AT A1: 1:500
STATUS: PLANNING
DRAWN: AM
CHECKED: GT
JOB NO: 21.926
DRAWING NO: PL.005
REV:

S & P

B Topographic survey


N

C Thames Water sewer records

Asset location search

Property Searches

Yes Engineering Group Limited
The Moat House,133 The Moat House

STAFFORD
ST16 2EZ

Search address supplied London Oxford Airport
Langford Lane
Kidlington
Oxford
Oxfordshire
OX5 1RA

Your reference 1703902

Our reference ALS/ALS/24/2018_3789993

Search date 8 May 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: London Oxford Airport, Langford Lane, Kidlington, Oxford, Oxfordshire, OX5 1RA

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:

SP4715SE
SP4714NW
SP4715SW
SP4714NE

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:

SP4715SE
SP4714NW
SP4715SW
SP4714NE

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/24/2018_3789993

SP4715SE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 447750,215250

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
7004	68.08	66.2
7001	n/a	n/a
8001	67.3	64.81
6003	n/a	n/a
6004	70.21	67.47
6005	69.81	66.76
7002	69.2	66.16
7101	68.61	65.91
8101	68.5	65.35
511E	n/a	n/a
6102	70.3	68.24
511D	n/a	n/a
6101	70.23	67.55
7102	69.6	66.86
8102	68.9	66.46
721A	n/a	n/a
721C	n/a	n/a
721D	n/a	n/a
721E	n/a	n/a
621A	n/a	n/a
721B	n/a	n/a
6002	n/a	n/a
6001	n/a	n/a
7003	68.08	66.5
511B	n/a	n/a
521C	n/a	n/a
521D	n/a	n/a
521E	n/a	n/a
511A	n/a	n/a
511C	n/a	n/a
5101	70.84	69.59
521A	n/a	n/a
5001	70.81	68.5
521B	n/a	n/a

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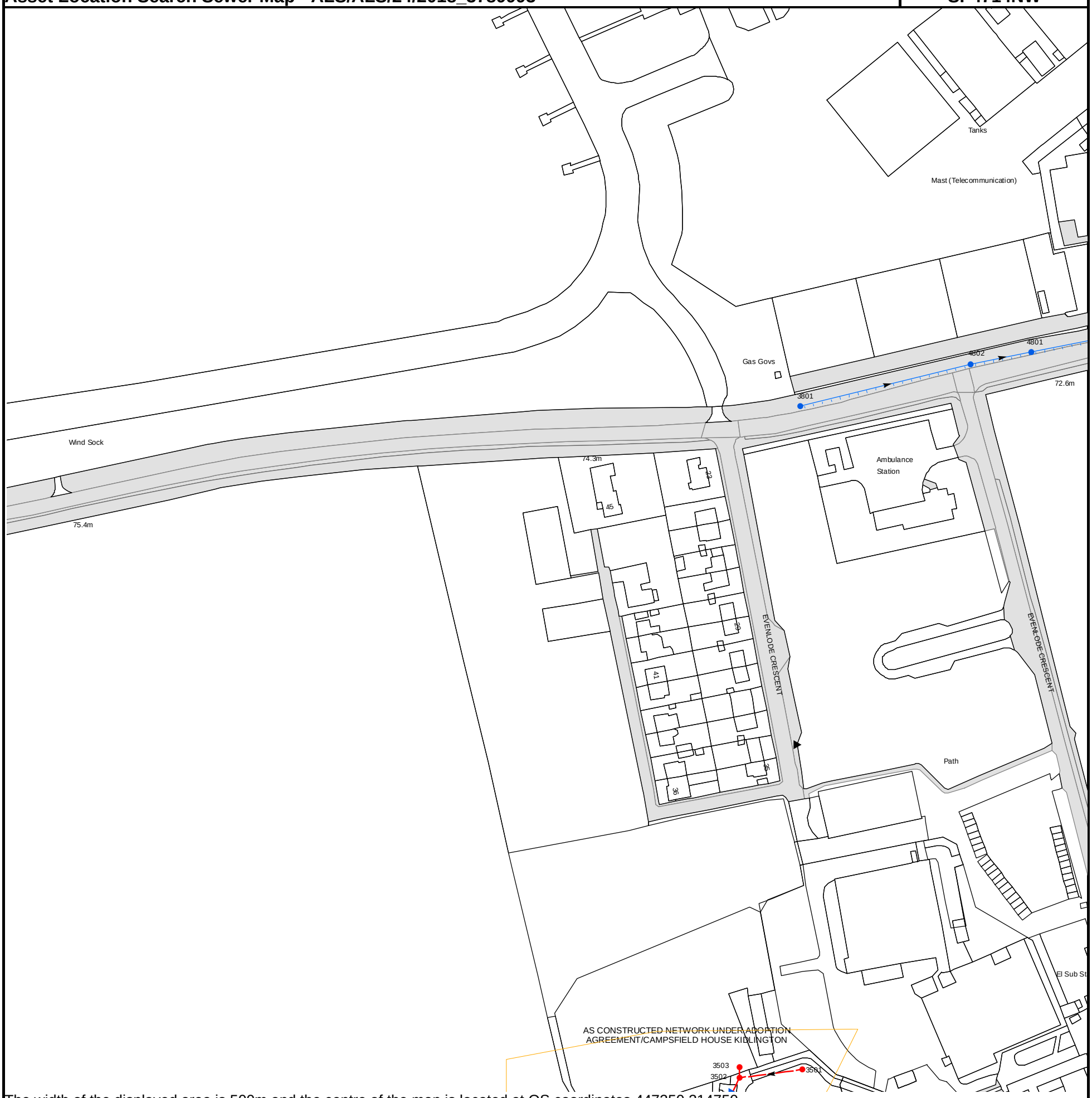
Asset Location Search Sewer Map - ALS/ALS/24/2018_3789993

SP4714NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 447250,214750

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
3801	n/a	n/a
4802	n/a	n/a
4801	n/a	n/a
3502	n/a	n/a
3501	n/a	n/a
3503	n/a	n/a

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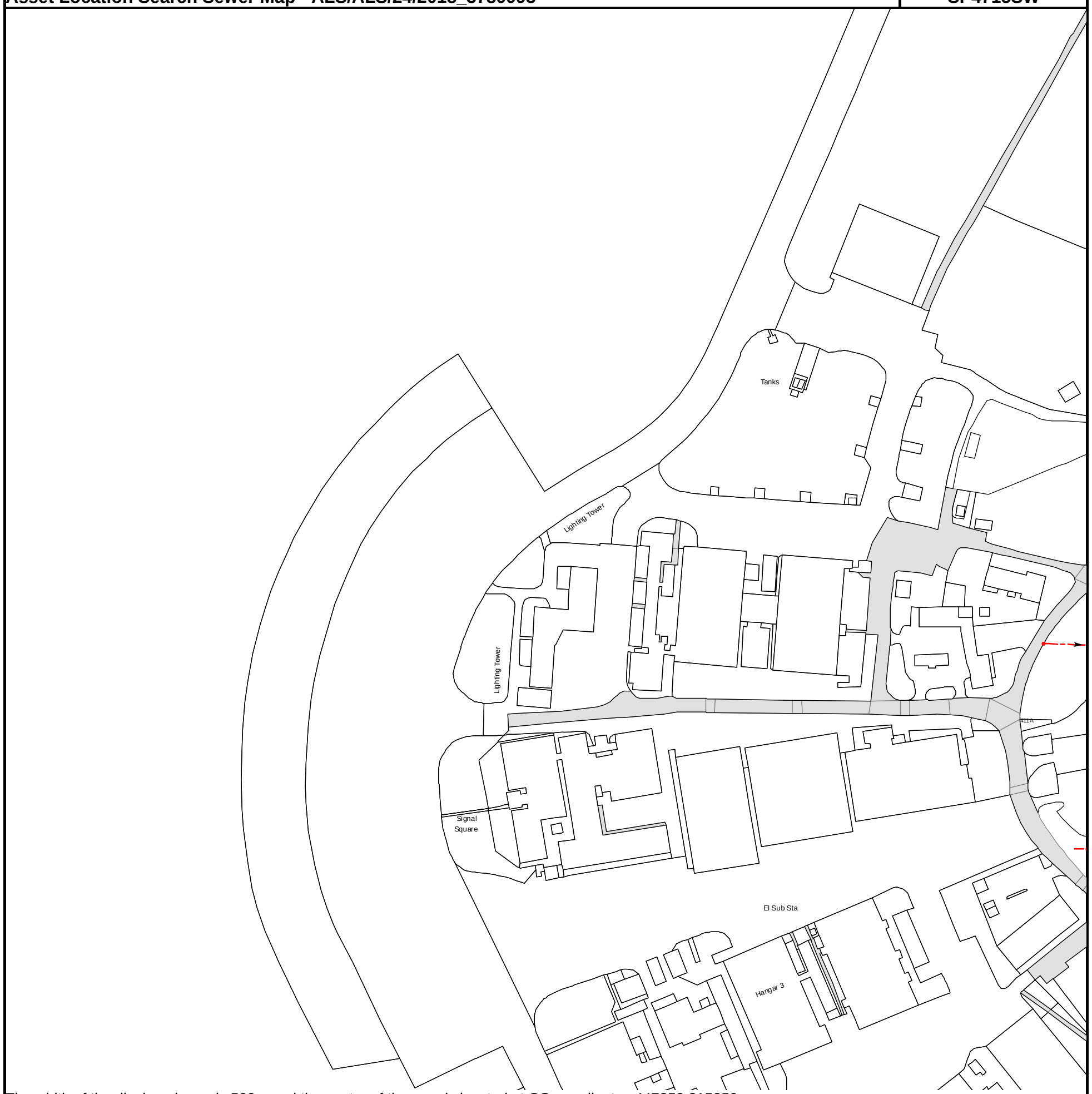
Asset Location Search Sewer Map - ALS/ALS/24/2018_3789993 | **SP4715SW**



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 447250,215250

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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
411A	n/a	n/a

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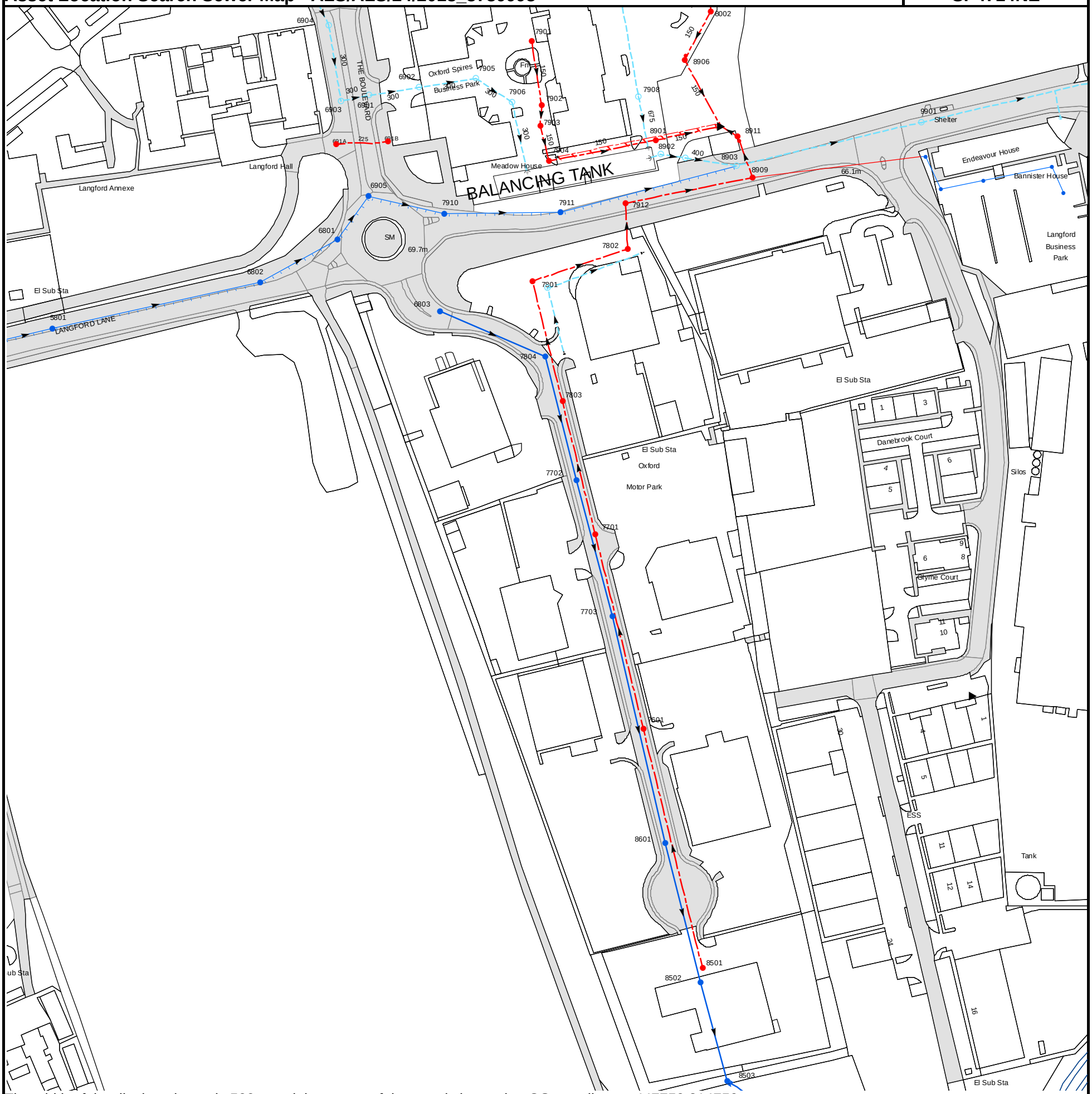
Asset Location Search Sewer Map - ALS/ALS/24/2018_3789993

SP4714NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 447750,214750

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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
8911	n/a	n/a
8909	n/a	n/a
9901	n/a	n/a
991A	n/a	n/a
991G	n/a	n/a
991F	n/a	n/a
991E	n/a	n/a
991C	n/a	n/a
991D	n/a	n/a
7911	n/a	n/a
7803	n/a	n/a
7702	n/a	n/a
7701	n/a	n/a
7912	n/a	n/a
7802	n/a	n/a
7908	n/a	n/a
8901	n/a	n/a
8902	n/a	65.35
8906	67	63.92
891B	n/a	n/a
8002	66.6	64.27
8903	n/a	n/a
5801	n/a	n/a
6802	n/a	n/a
6904	n/a	n/a
691A	n/a	n/a
6801	n/a	n/a
6903	n/a	n/a
6905	n/a	n/a
6901	n/a	n/a
691B	n/a	n/a
6902	n/a	n/a
6803	n/a	n/a
7910	n/a	n/a
7905	n/a	n/a
7906	n/a	n/a
7901	n/a	n/a
7801	n/a	n/a
7903	n/a	n/a
7902	n/a	n/a
7804	n/a	n/a
781G	n/a	n/a
7904	n/a	n/a
8503	n/a	n/a
8502	n/a	n/a
8501	n/a	n/a
8601	n/a	n/a
7601	n/a	n/a
7703	n/a	n/a

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

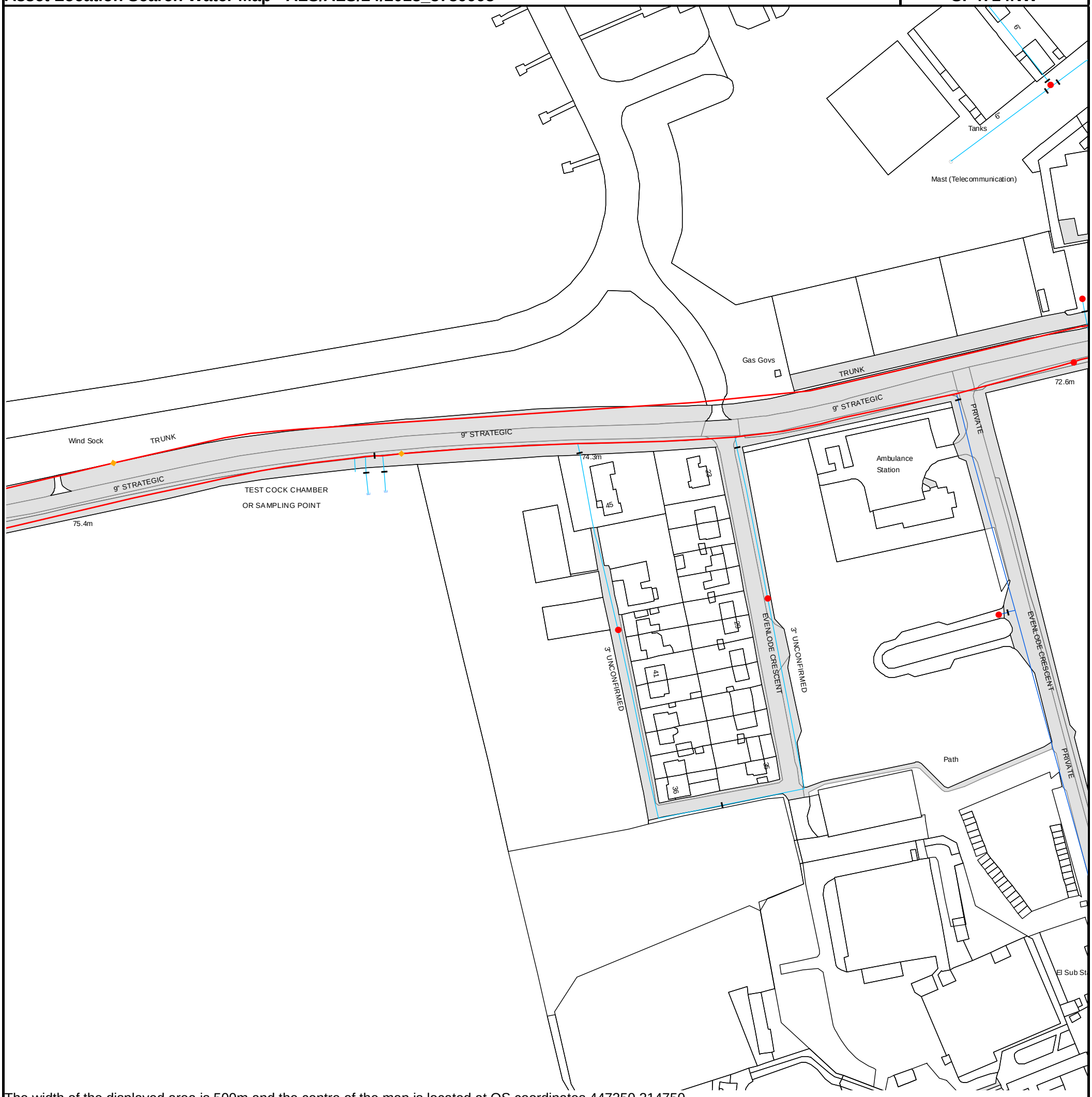
Asset Location Search Water Map - ALS/ALS/24/2018_3789993

SP4715SE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 447750,215250

Asset Location Search Water Map - ALS/ALS/24/2018_3789993

SP4714NW



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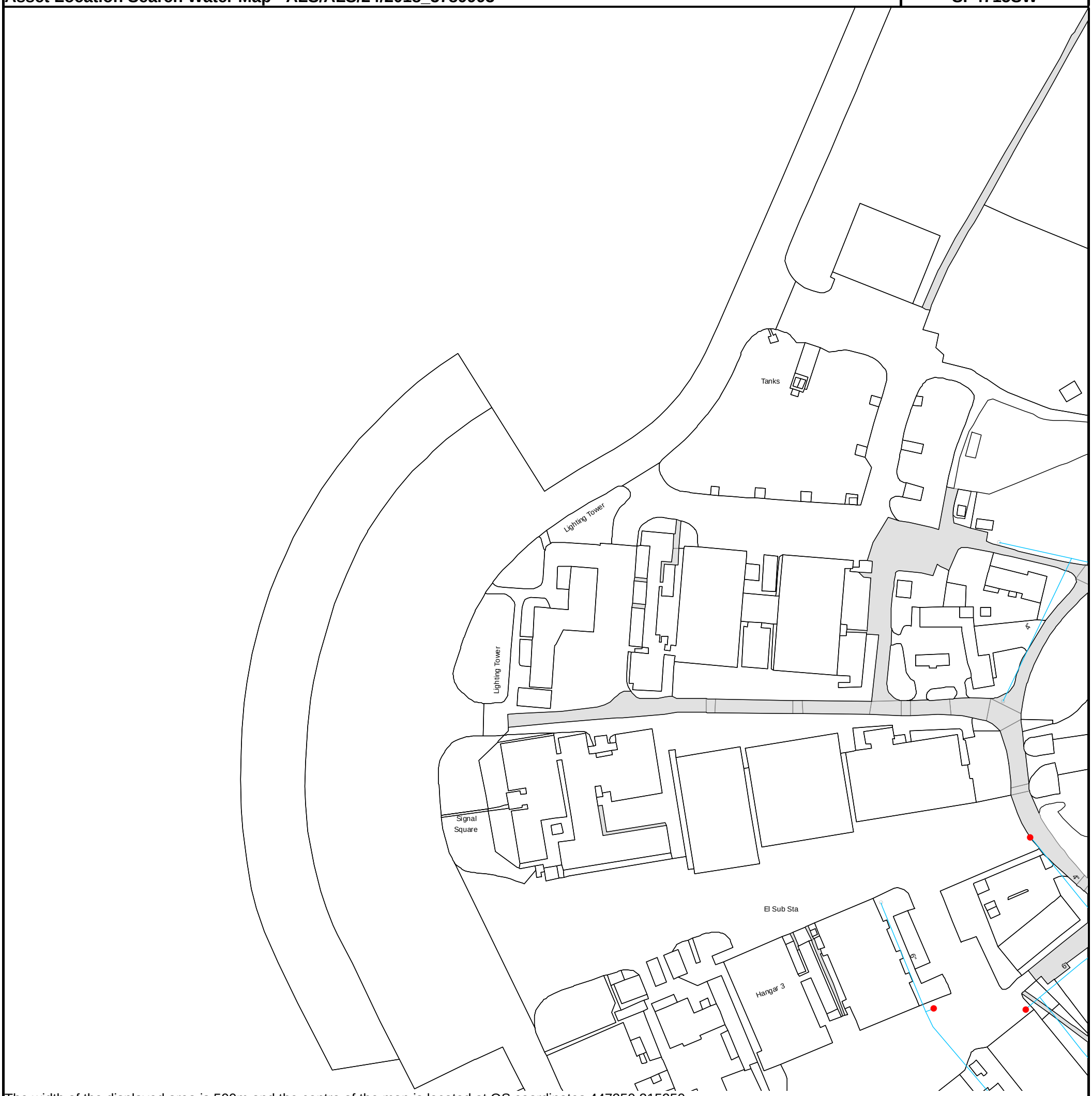
Asset Location Search Water Map - ALS/ALS/24/2018_3789993	SP4715SW



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Asset Location Search Water Map - ALS/ALS/24/2018_3789993

SP4714NE

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ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

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

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

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

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

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

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

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

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

Ways to pay your bill

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

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

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

The Search Code:

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

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
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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

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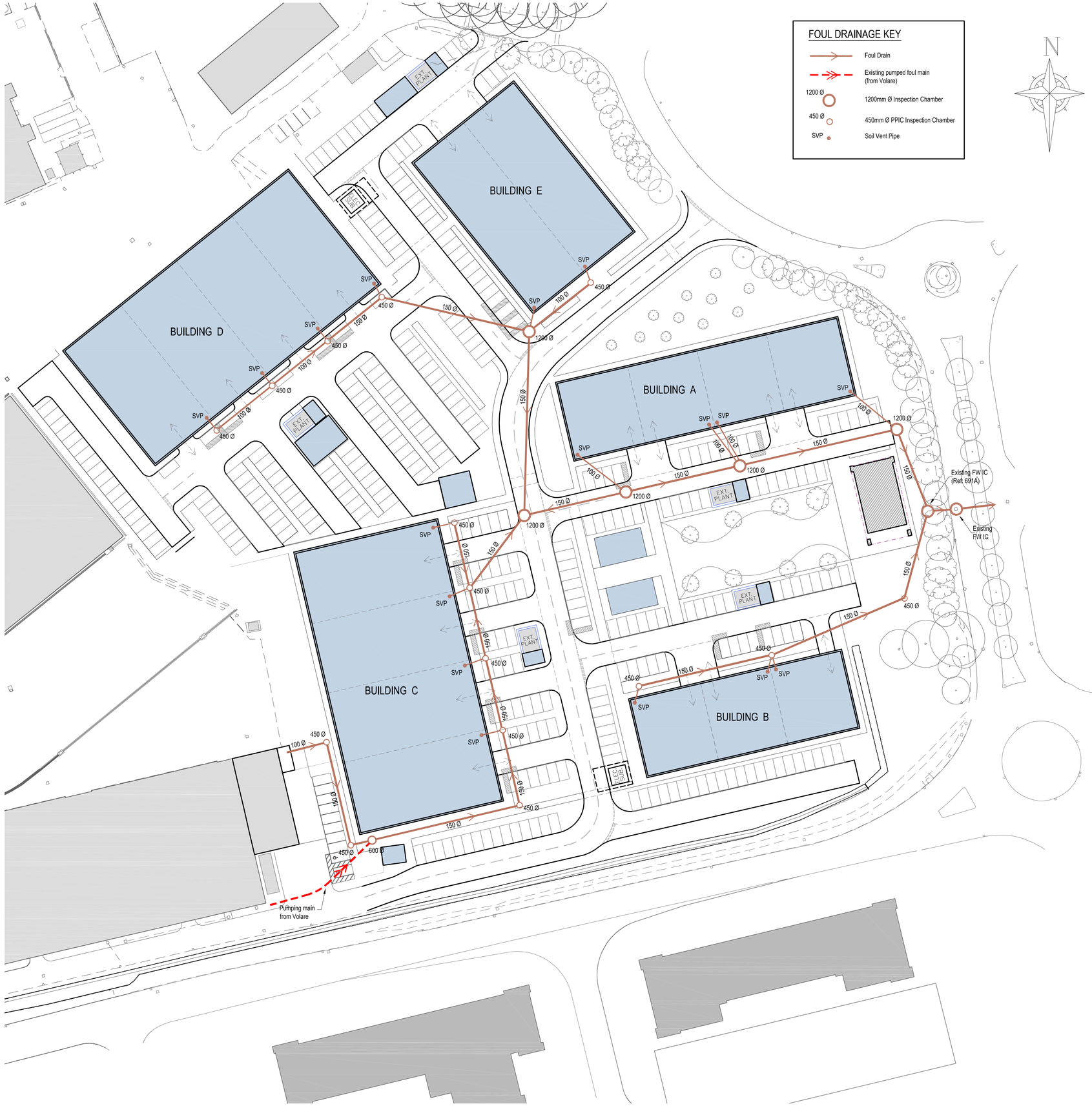


PRELIMINARY

DO NOT SCALE.

Note

Use figured dimensions only.

All dimensions are to be checked on site prior to construction or fabrication and any discrepancies reported to the author.

All building materials, components and workmanship to comply with current construction legislation, Building Regulations, Codes of Practice and where appropriate manufacturers recommendations.

This drawing is to be read in conjunction with all related drawing issues.

0m 10m 20m 30m 40m

Scale 1:500 @ A1

Revisions

Rev	Description	Drn	Date
–	First Issue	RJB	31.01.23

Project

Oxford London Airport

Science Park

Drawing Title

Foul Drainage Layout

Civils
Construction & Property Solutions
Civils Contracting Ltd
3 Archers Park, Branbridges Road, East Peckham, Kent TN12 5HP
Tel – 01622 878303 Fax – 01622 878301

Scale 1:500 @ A1

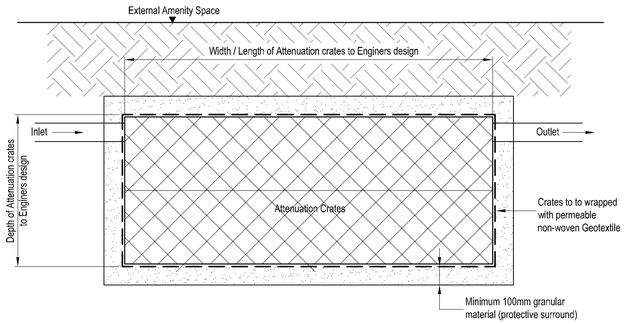
Date January 2023

Drawing No 2056 - 101

Rev

SURFACE WATER DRAINAGE KEY

- Surface Water Drain
- Surface Water Fin Drain
- 1200 Ø — 1200mm Ø Inspection Chamber
- 450 Ø — 450mm Ø PPIC Inspection Chamber
- RWP — Rainwater Down Pipes
- Surface Water Attenuation Storage Crates



Surface Water Storage / Attenuation Crate Detail

New 1200 Ø IC with outflow restricted to 5 litres per second

Existing SW IC (Ref. 6905)

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Science Park

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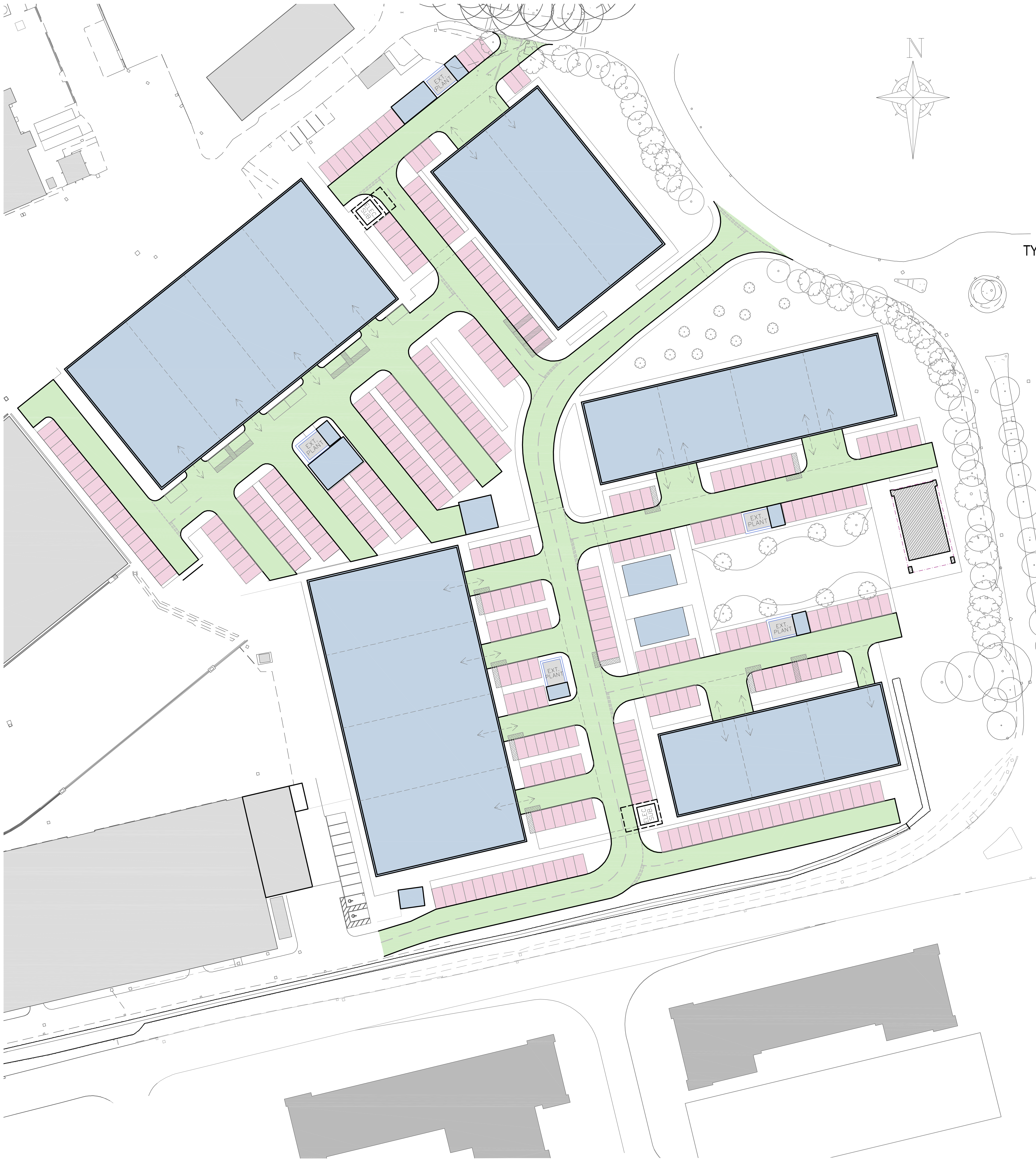
Tel – 01622 878303 Fax – 01622 878301

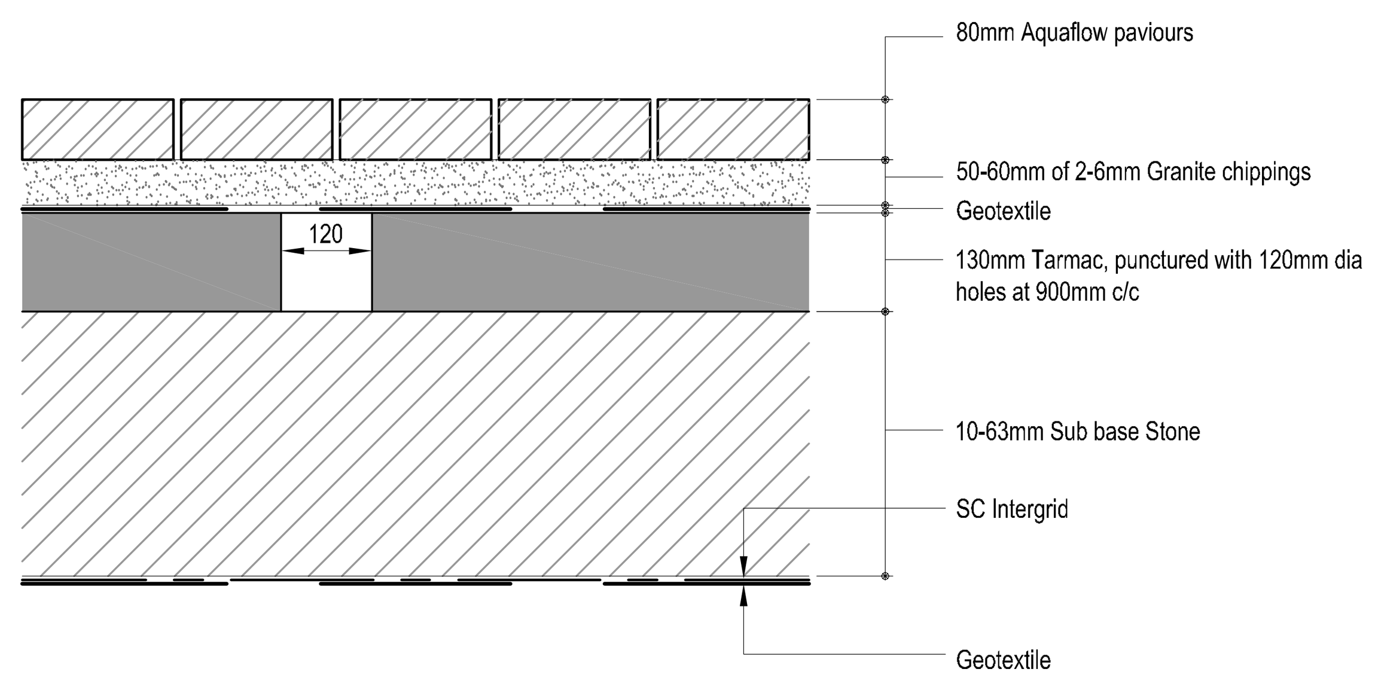
Scale 1:500 @ A1

Date January 2023

Drawing No 2056 - 102

Rev



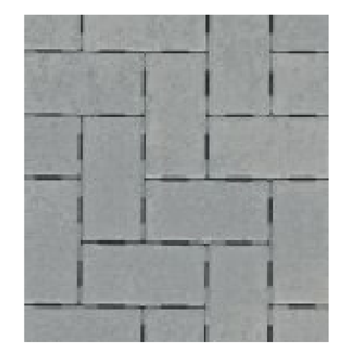


TYPICAL AQUAFLOW PAVING CONSTRUCTION DETAIL

EXTERNAL PAVING KEY:

ACCESS ROAD
80mm Formpave Aquaflow permiable paving laid in herringbone patten
Colour: Charcoal (Grey)

PARKING AREAS
80mm Formpave Aquaflow permiable paving laid in herringbone patten
Colour: Red Brindle



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Colour: Charcoal (Grey)

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80mm Formpave Aquaflow permiable paving laid in herringbone patten
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0m 10m 20m 30m 40m

Scale 1:500 @ A1

Revisions

Rev	Description	Drn	Date
–	First Issue	RJB	31.01.23

Project
Oxford London Airport

Science Park

Drawing Title

Surface Water Drainage Strategy

SUDS - External Paving

Civils
Construction & Property Solutions

Civils Contracting Ltd
3 Archers Park, Branbridges Road, East Peckham, Kent TN12 5HP
Tel – 01622 878303 Fax – 01622 878301

Scale	Date
1:500 @ A1	January 2023

Drawing No	Rev
2056 - 103	