

Contents

- 1 Introduction
- 2 Existing Structure
- 3 Proposed Structure
- 4 Assumed Sequence of Construction
- 5 Movements

Appendices

- A Mapping
- B Proposed Drawings
- C Geotechnical Site Investigations
- D Unexploded Ordnance Threat Assessment
- E Construction Management Plan
- F Ground Movement Analysis
- G Flood Risk Assessment
- H Structural Calculations

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Approved by: Andy Heyne

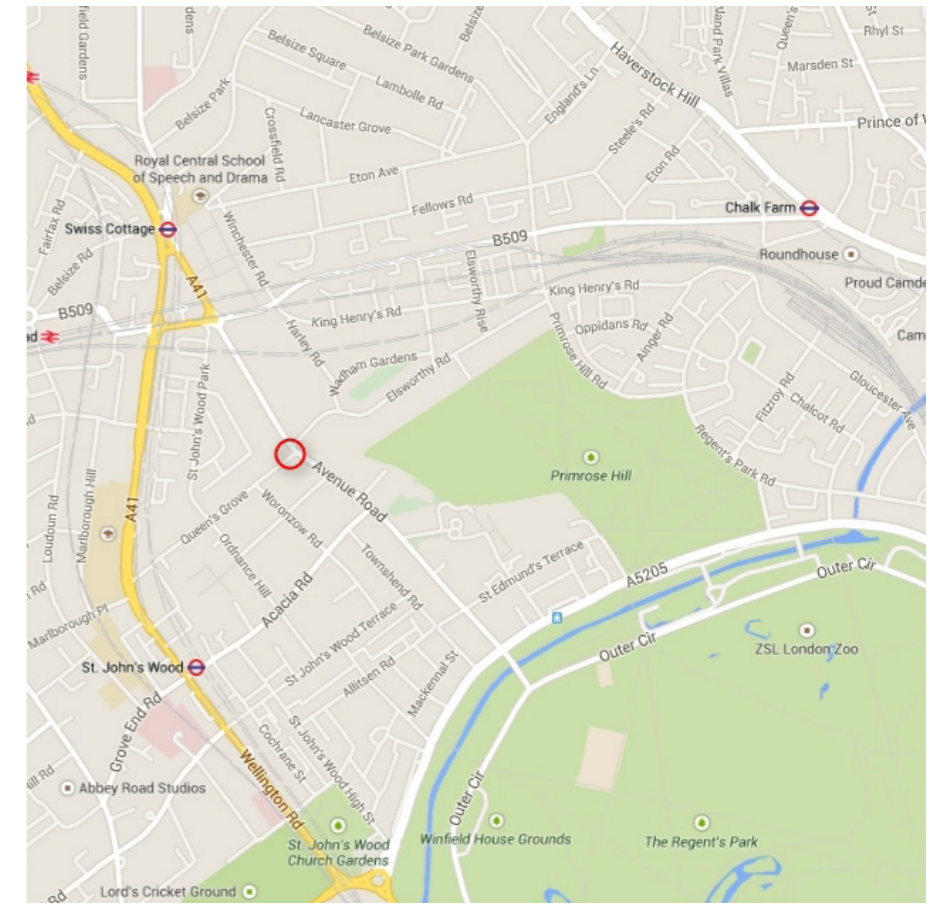
1 Introduction

Heyne Tillett Steel have been appointed by Deroda Investments Ltd to provide structural engineering advice for the proposed refurbishment of 73-75 Avenue Road, in support of a planning application. This report summarises the initial scheme proposals and structural implication of the alterations and the creation of a new basement level beneath the property.

Both project director Andy Heyne and project engineer Neil Cameron are chartered members of the Institution of Structural Engineers and have extensive experience designing new basement extensions beneath existing buildings throughout London and the UK.

This report is based upon the proposals prepared to date by Purcell Architects.

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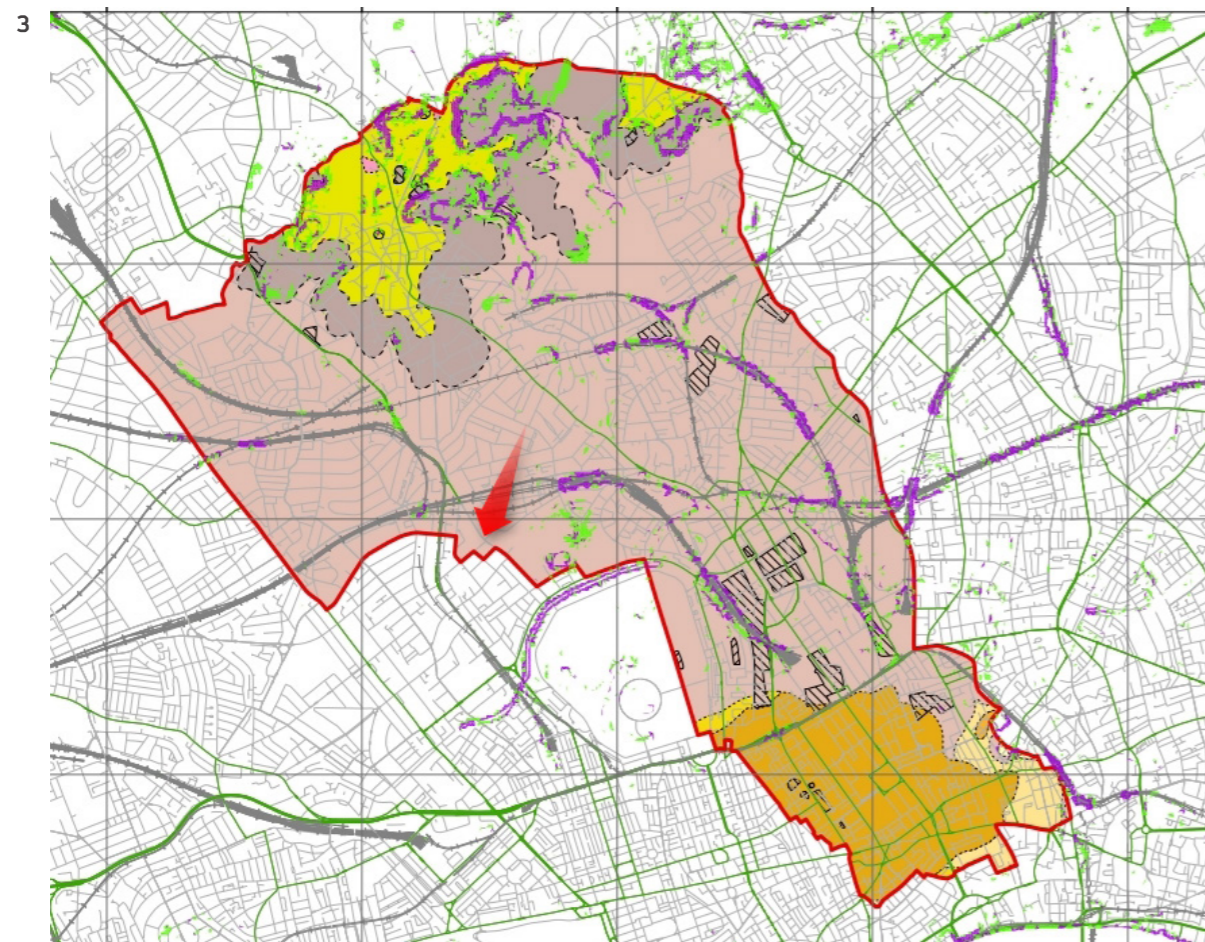
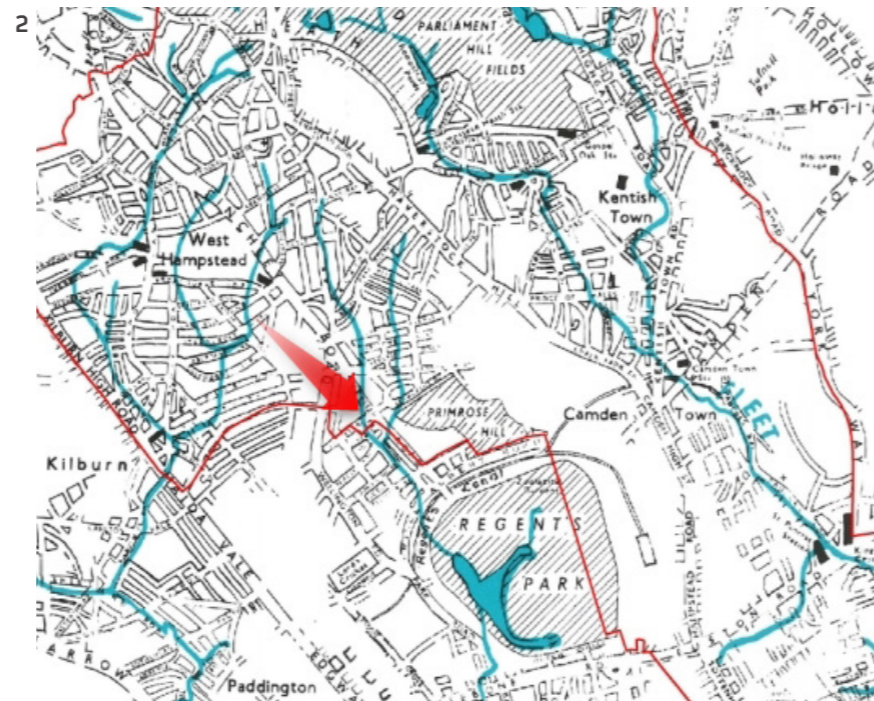
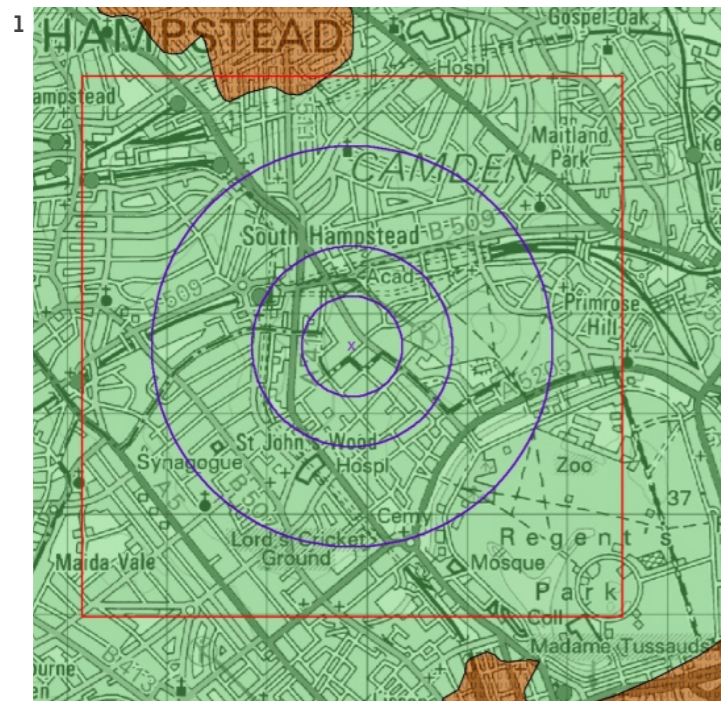


3



Images

- 1 Site Location Plan
- 2 Birds Eye View of Site
- 3 Site Plan



2 Existing

2.1 Existing site

The site is located at the junction of Avenue Road and Queens Grove. The site can be located by the National Grid reference 526943,183831 or approximately by the postcode NW8 6HP. The site is approximately 575m south southeast from Swiss Cottage Underground station and approximately 525m northeast from St Johns Wood Underground Station.

The site is bounded by no.77 Avenue Road to the north, Avenue Road Carriageway to the east, Queens Grove carriageway to the south and no.38 Queens Grove to the west.

The local area is residential in nature and dominated by large detached properties along Avenue Road and Queens Grove generally three to four storeys above street level.

The site is located within flood zone 1 according to the flood maps. The site is located on London Clay classified as non-productive strata (Non-aquifer) and therefore the site does not lie in an area of groundwater vulnerability.

The culverted river Tyburn runs northwest – southeast adjacent to the site, it is believed within the combined sewer network beneath Avenue Road Carriageway. The site is located approximately equidistance between Baker Street, Edgware Road and Marble Arch underground stations, the below ground infrastructure associated with these stations or the tunnels leading from them are all approximately 400-500m from the site to the north and south.

The site was flooded from surface water in 2002.

The site is located in an area with a slope angle less than 7 degrees and is not located near an area with a significant landslip potential.

2.2 Existing Site Description

The site is currently occupied by no.75 Avenue Road and a private swimming pool building constructed on the no.73 Avenue Road Plot. The site gently slopes from north to south. The site is largely soft landscaped with the exception of the buildings and the front driveway area.

The existing structure to no. 75 Avenue Road consists of a three storey large detached property with vertical structure consisting of solid load bearing thick masonry walls to the external elevations and internal load bearing Masonry partitions.

The internal suspended floors are formed from timber joist floors which span onto and are supported by the load bearing masonry walls. The mansard roof structure is also framed in timber and supported by the masonry walls.

The foundations are shallow strip footings positioned under the load bearing masonry walls founded on the London Clay strata.

Images

- 1 Aquifer Map
- 2 London Lost Rivers
- 3 Slope Angle Map

Stability is provided by diaphragm action within the floors carrying lateral loads back to the masonry walls which act in bending and shear to transmit the lateral loads to the foundation.

2.3 Site History

The earliest historic maps of the site seen show that the site was developed with two detached properties as early as 1872, very little change occurred to the site until No.73 Avenue Road was demolished shortly after 1939 and a new residential property was partly constructed which can be seen on the aerial photograph taken in 1946.

The bomb maps of London show that the no.73 Avenue Road plot was used as a rubble clearance site to store demolished material from local bomb damaged properties.

Following the war the partly built no.73 property was demolished and the private swimming pool structure was constructed in 1970 as part of no.75 Avenue Road.

The course of the original River Tyburn flowed close to the current site until it was diverted into a culverted sewer constructed beneath Avenue Road which now forms part of the combined sewer network.

2.4 Searches and Surveys

An envirocheck report has been commissioned to show the historic land uses of the site and the development over time, this report is appended to this report.

An intrusive site investigation was carried out in January 2011 to investigate the existing ground conditions and the form and condition of the existing internal structure. A further site investigation was carried out in January 2015 mainly to prove the extent of any reworked ground associated with the original river channel. Both of these site investigation reports are appended to this report.

An Unexploded Ordnance detailed threat assessment has also been carried out for the site due to the level of local bomb damage sustained during the war. A copy of this report is appended to this report.

2.4 Existing Ground Conditions

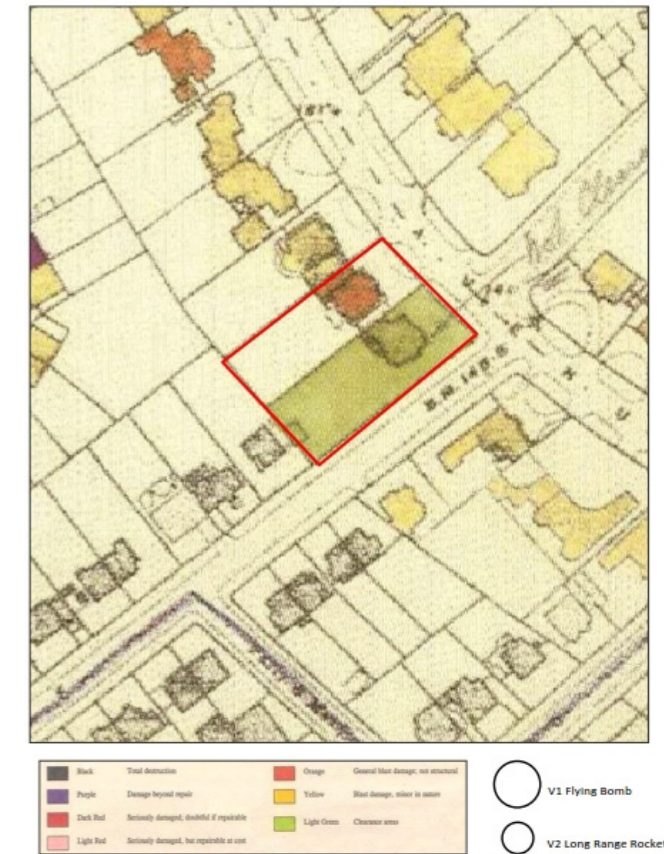
The site investigations carried out have shown that the underlying ground conditions for the site are a thin layer of made ground overlying over stiff clay to depth. Refer to the site investigation logs appended to this report.

Water was not encountered in any of the site investigation boreholes or trial pits.

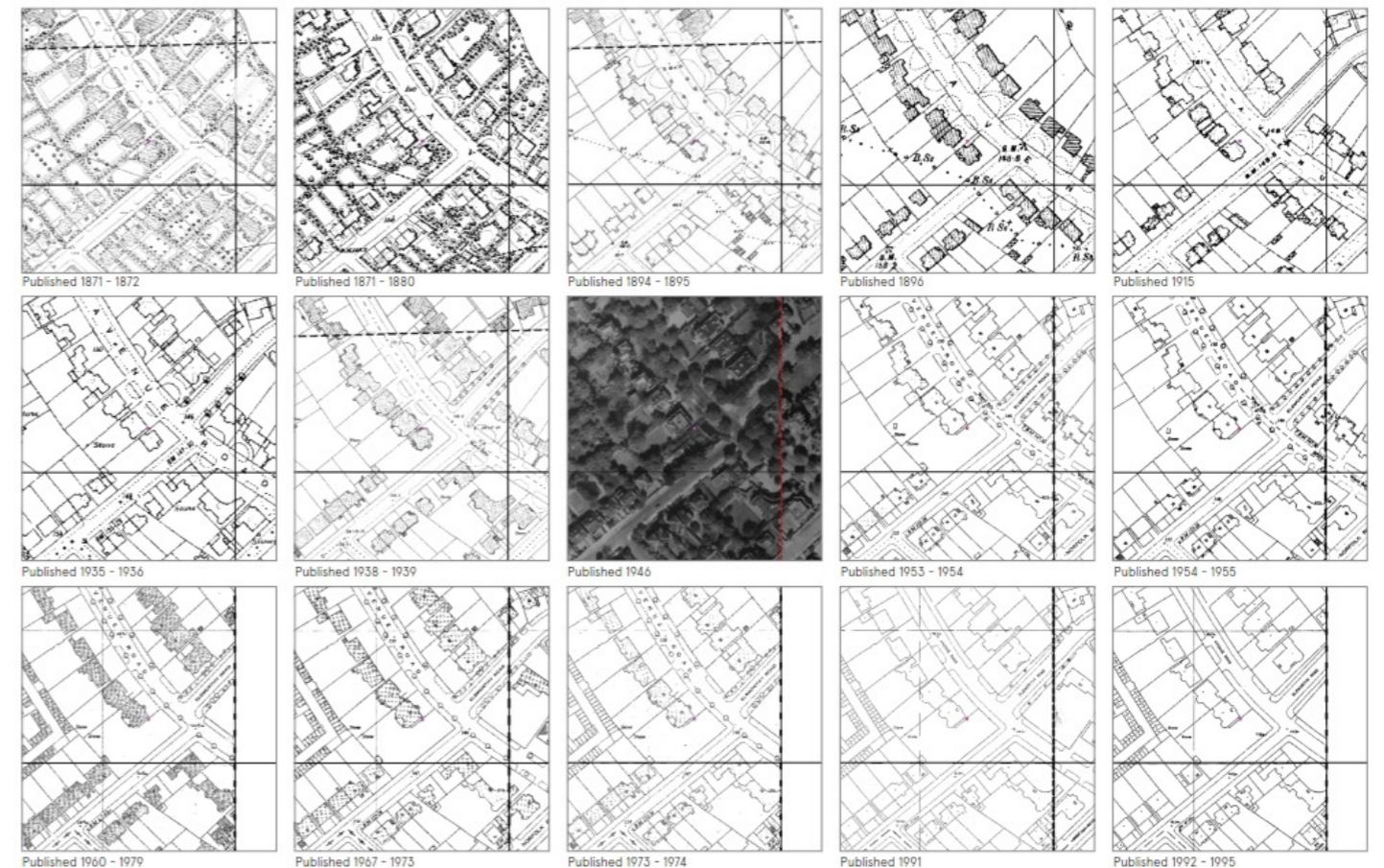
Images

- 1 WWII Bomb Map
- 2 Historic Map

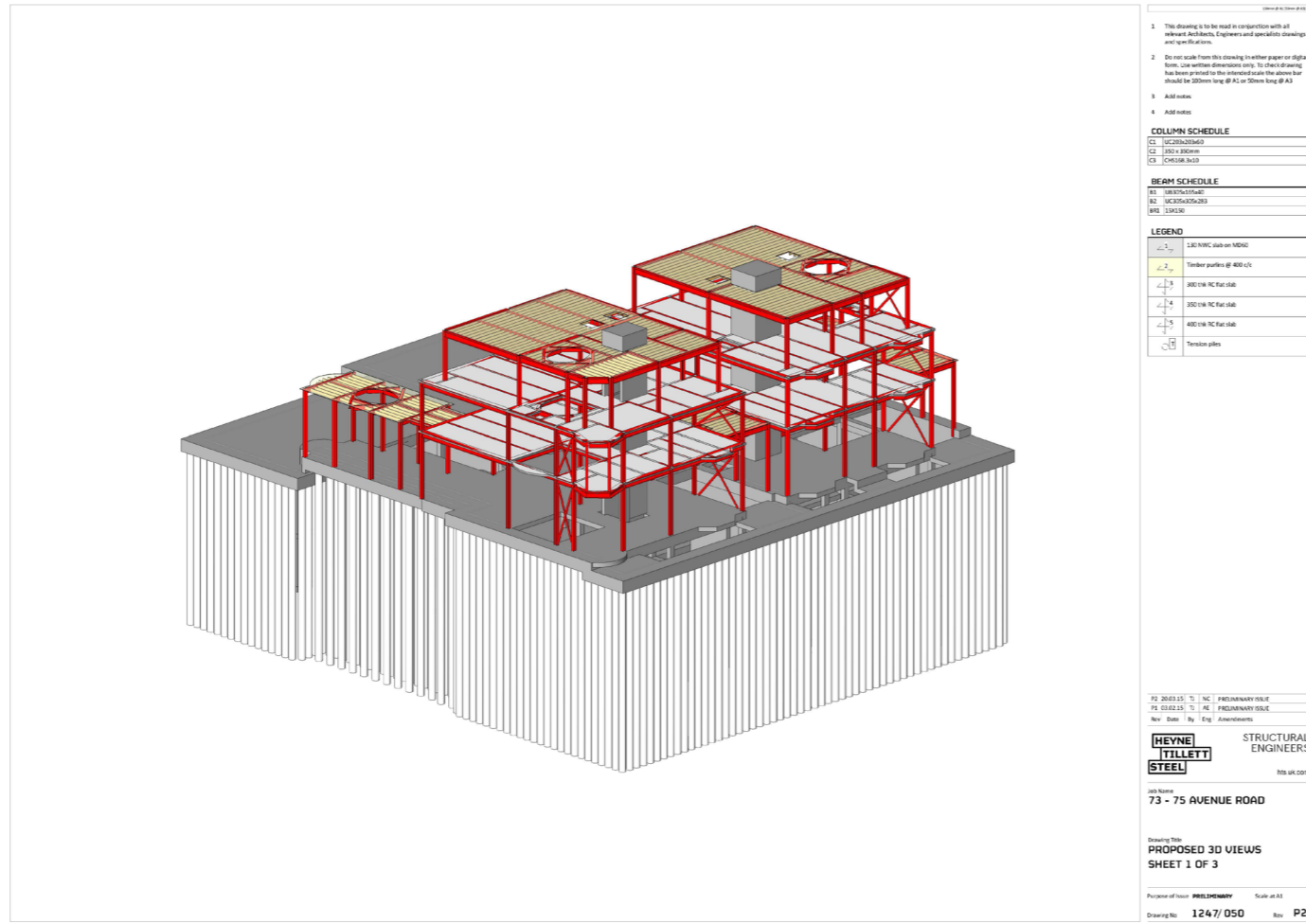
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2



1



3 Proposed Structure

The proposals are to create two large detached properties on the plot; both will consist of three storeys of above ground residential accommodation and two storeys of below ground accommodation which is created within a shared basement box.

3.1 Proposed Structural Arrangement

The proposals can be split into two main areas of works which are described separately below;

3.1.1 Substructure / Basement

The two storey basement for both properties is to be built as a single basement enclosure with a separating wall between which consists of a contiguous piled wall with a water resisting liner wall cast to the front of the piles.

A water resisting lower basement slab which spans between pile caps beneath vertical structure elements and tension piles. Tension piles are required to resist the uplift on the basement slab from hydrostatic pressure and these are positioned to reduce the span of the slab which bends between these piles and the pile caps in the uplift situation.

A proprietary clay heave protection board is provided beneath the suspended basement slab to deal with the heave from the clay and ensure the basement slab is not subjected to uplift from clay heave.

The upper basement slab is designed as a suspended reinforced concrete slab which supports the vertical loads and transfers these loads back to the vertical structural elements and also acts as a prop for the basement retaining walls at this intermediate level.

The lower ground floor slab and ground floor slab and all supporting structure beneath is formed from reinforced concrete as shown on the Heyne Tillett Steel Drawings appended to this report.

The swimming pool areas are formed from a typical "box in a box" construction

The design of the basement box accounts for a hydrostatic pressure assuming a water table one meter below ground level as slow seepage of water through the London Clay can still occur.

Below ground waterproofing will be provided through two measures, the first will be a bentonite membrane laid beneath the suspended basement slab and fixed to the face of the contiguous piled walls and lapped around the capping beams. The second form of waterproofing will be provided by the water resisting concrete basement slab and liner walls.

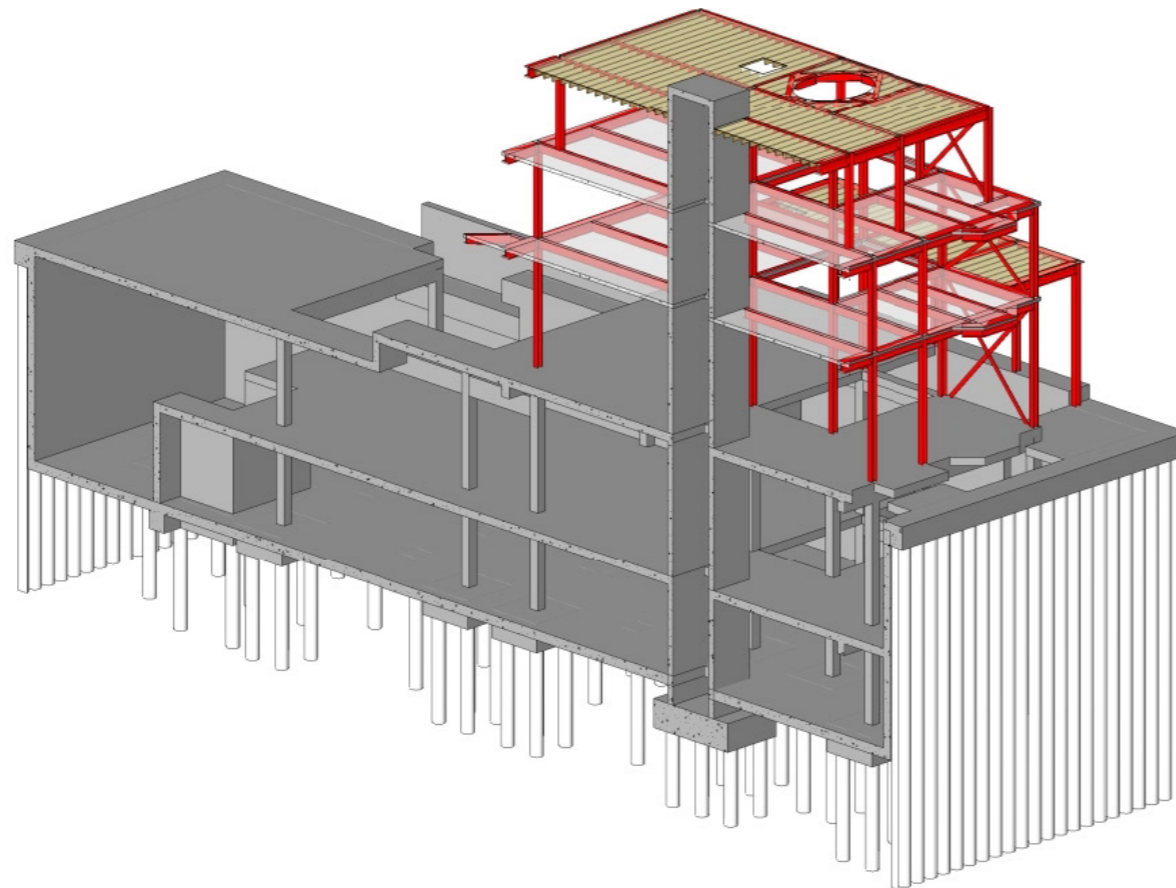
3.1.2 Superstructure

The proposed superstructure will be formed from a steel frame of columns and beams supporting a composite steel / concrete deck. The steel frame will be supported from the reinforced concrete box at ground floor.

Images

- 1 Proposed 3D View of Structure 1
- 2 Proposed 3D View of Structure 2

2



The external facades will be constructed from masonry and stone and the external leaf of the cavity walls will be self-supporting to avoid any soft joints being introduced at floor levels. The inner skin of the cavity walls will be a Metsec SFS or timber stud and will be supported from each floor level.

Stability is provided by diaphragm action within the floors which carries the lateral loads from the facades to braced stability bays which transfer the loads to the foundations.

3.1.4 Proposed Drainage

Refer to the Heyne Tillett Steel Flood Risk Assessment report appended to this report for details for the proposed below ground drainage and SUDS proposals.

3.1.5 Hydrogeology - assessment of the impact on groundwater flows

Refer to the Heyne Tillett Steel Flood Risk Assessment report appended to this report for details of the impact on groundwater flows.

4 Assumed Sequence of Construction:

4.1 Tree protection

Tree protection works are to be put in place as detailed in the Landmark Tree report to protect existing trees and root protection areas from damage during the construction works

4.2 Site set up and welfare

- Site accommodation will be created to the front of no.75 Avenue Road as shown in the Knightbuild Construction Management Plan appended to this report.
- The loading bay will be created off carriageway as shown in the Knightbuild Construction Management Plan.
- Existing services will be disconnected by the contractor.
- Hoardings and scaffolding will be created as shown in the Knightbuild Construction Management Plan

4.3 Demolition works

- Soft strip of the existing properties
- Demolition of the existing structures on site and grubbing out of all foundations

4.4 Substructure

4.4.1 Piling

- Piling will take place from existing ground level and will form the contiguous piled wall to the basement perimeter and also the bearing and tension piles which will be cut down and connected to the lower basement slab.

4.4.2 Capping Beams

- Local excavation will take place for the formation of the capping beams.
- The bentonite waterproofing membrane will be laid under and outside the capping beam.
- Reinforcement for the capping beams will be installed and the capping beams cast.

4.4.3 Excavation and temporary works

- Excavation will take place within the basement piled box.
- As the excavation continues temporary waler beams and props will be installed close to the proposed slab levels to minimise deflections of the piled wall until the permanent slab props are installed.
- The bearing and tension piles will be cut down to their final cut off level as the excavation progresses.

4.4.4 Drainage and ducts

- Any below ground ducts, drainage and sump chambers will be installed beneath the lowest basement slab prior to the slab being installed.
- Bentonite waterproofing membranes will be laid beneath the pile caps and slab and dressed up the face of the piled walls and lapped to the capping beam waterproofing.

4.4.5 Internal Substructure works

- Clay heave protection and waterproofing membranes will be installed beneath the basement slab
- The reinforcement for the basement slab and pile caps will be constructed and the concrete cast. The slabs will be dowelled into the piled walls.
- The liner wall reinforcement will be installed and the liner walls cast. The liner walls will be dowelled to the contiguous piled wall.
- The internal columns, walls and suspended slabs will be constructed in sequence from the lower basement slab upwards.
- The temporary props will only be removed once each level has been cast and gained sufficient strength to provide the permanent propping.

4.5 Superstructure

- The steel superstructure frame of columns and beams will be assembled on site.
- Composite floor decks will be installed and the concrete cast on top.
- The external walls will be constructed
- Mansard roof structures will be completed with the timber infill structure between the steel frames.

4.6 Further works

The fit out works including all internal non-load bearing partitions, finishes, external works and decorations will follow the completion of the superstructure works.

5 Movements

The following observations are taken from the GEA ground movement analysis appended to this report

5.1 Expected movements and damage to adjoining and adjacent properties

Please refer to the GEA ground Movement Analysis report appended to this report for full details.

In summary the damage to the adjacent properties at 77 Avenue Road and 38 Queens Grove are shown to be limited to category 0 damage.

5.2 Preliminary Movement monitoring strategy

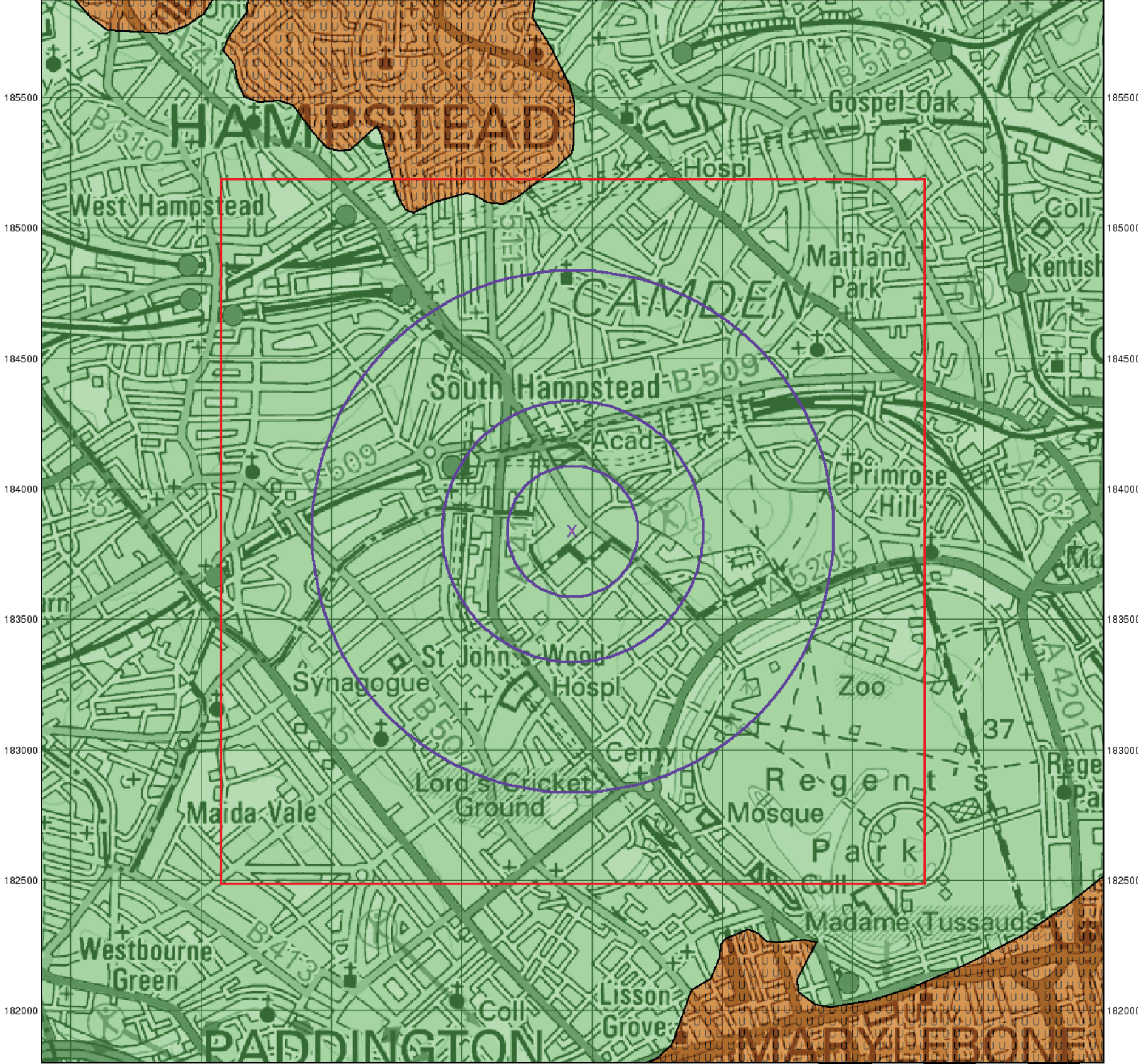
A preliminary movement monitoring strategy has been shown below; this will need to be agreed with the adjoining owners through the party wall awards and may be subject to further revisions.

Status of Alert	Max. vertical or horizontal Displacement	Action(s) in the event of a trigger level being exceeded
Green	4mm	No action other than carry out work to original method statements and planned frequency for monitoring. Issue weekly or fortnightly reports to interested parties.
Amber 1	6mm	Inform SEng & Temporary Works Engineer that green trigger exceeded. Continue work but with increased vigilance required monitoring at least once per day. Issue daily reports (where practical) to interested parties.
Amber 2	9mm	Inform SEng, AO's Eng & Temporary Works Engineer immediately. Stop all works and await instruction. Increase monitoring at critical zones to more than twice daily and continue twice daily elsewhere. Issue reports within 24 hours to interested parties.
Red 1	12mm (movement ceased)	Inform SEng, AO's Eng & Temporary Works Engineer immediately. Stop all works and await instruction. Increase monitoring at critical zones to more than twice daily and continue twice daily elsewhere. Issue reports within 24 hours to interested parties.
Red 2	12mm (movement continuing)	Inform SEng, AO's Eng & Temporary Works Engineer immediately. Stop all works and seek immediate instruction. Increase monitoring to constant readings until movement ceased. Issue reports within 24 hours to interested parties. Advise adjoining occupiers in the unlikely event that continued movement leads to evacuation of the site.

Appendix A

Mapping

525000 525500 526000 526500 527000 527500 528000 528500



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Groundwater Vulnerability

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

Major Aquifer (Highly Permeable)

- High (H) 1, 2, 3, U
- Intermediate (I) 1, 2
- Low

Minor Aquifer (Variably Permeable)

- High (H) 1, 2, 3, U
- Intermediate (I) 1, 2
- Low

Non Aquifer (Negligibly Permeable)

-

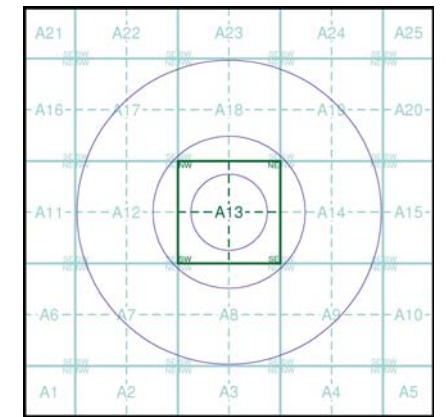
Water or Sea

-

Drift Deposit

-

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 64368977_1_1
 Customer Ref: 1247
 National Grid Reference: 526920, 183840
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

73-75 Avenue Road, LONDON, NW8 6JD



Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

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Bedrock Aquifer Designation

General

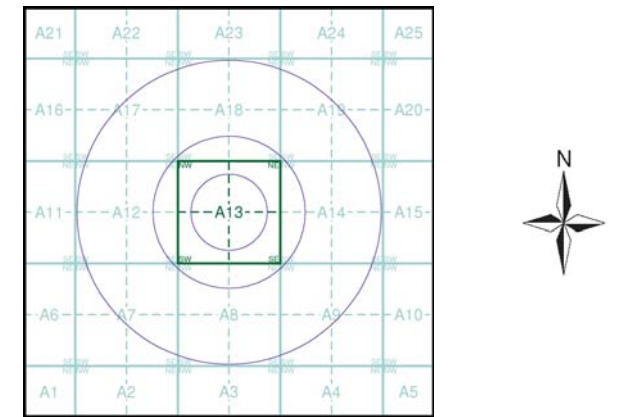
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



Order Details

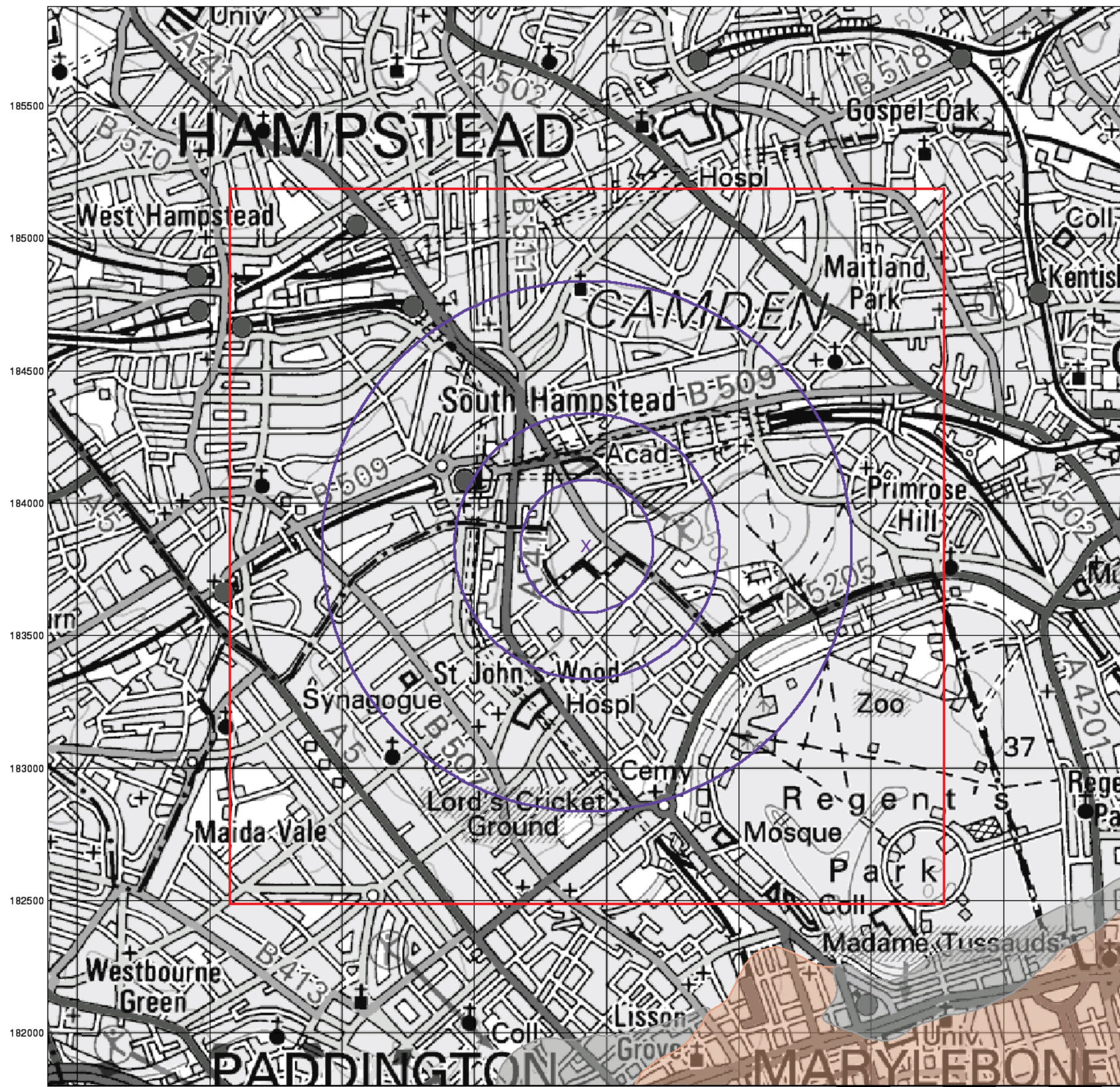
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 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

73-75 Avenue Road, LONDON, NW8 6JD



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Superficial Aquifer Designation

General

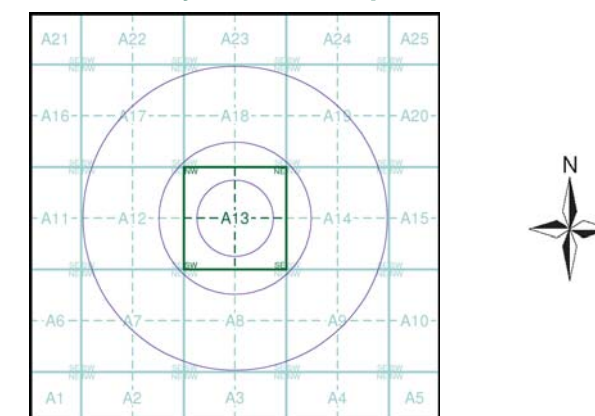
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- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



Order Details

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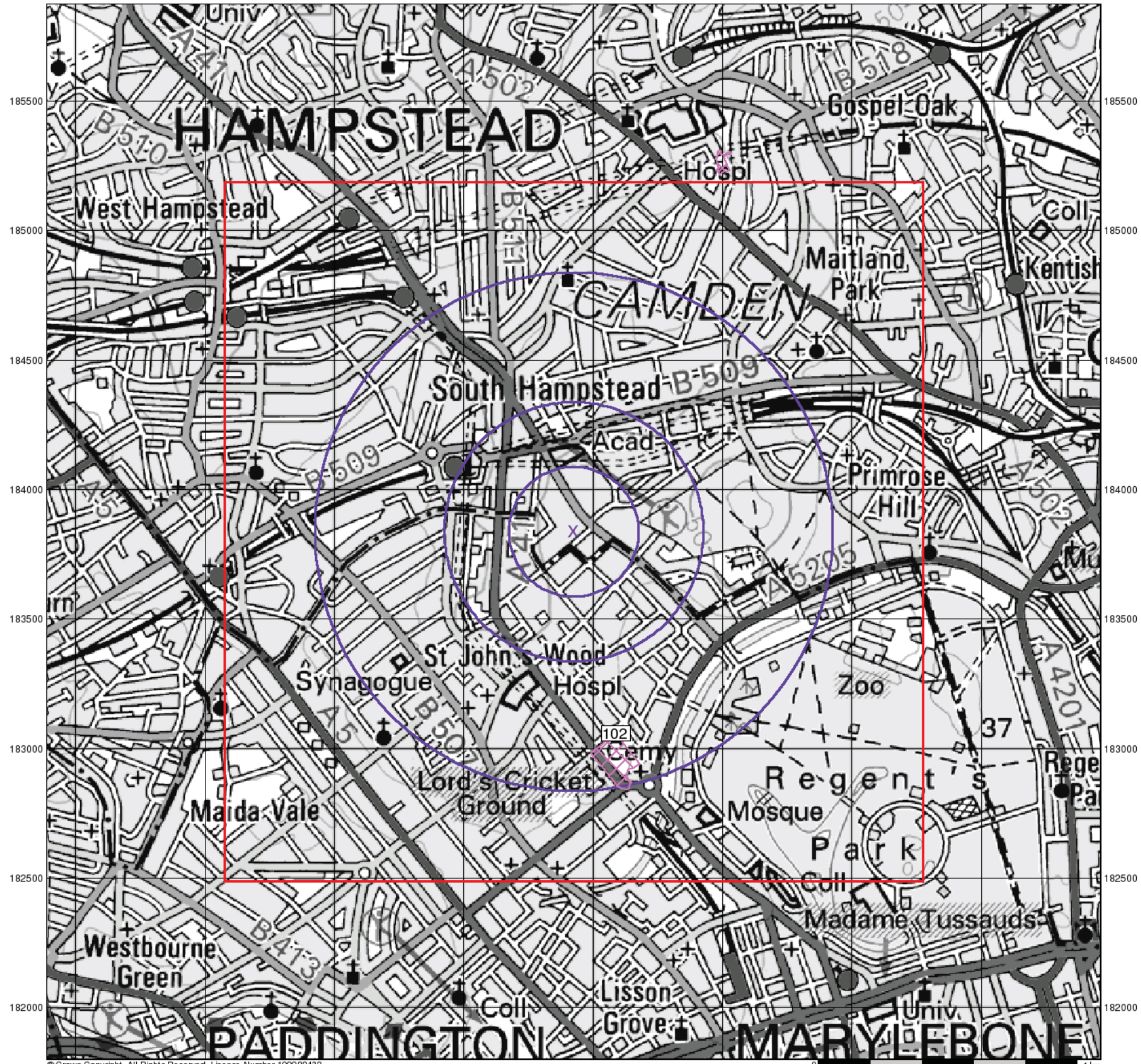
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Sensitive Land Uses

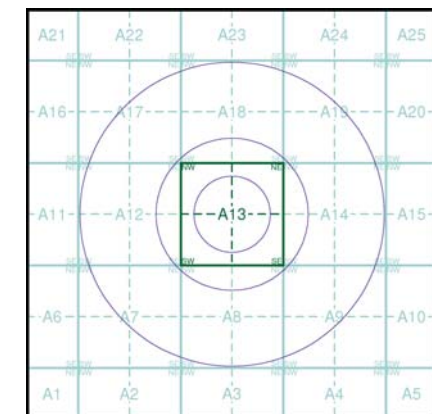
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Sensitive Land Uses

- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

Site Sensitivity Context Map - Slice A



Order Details

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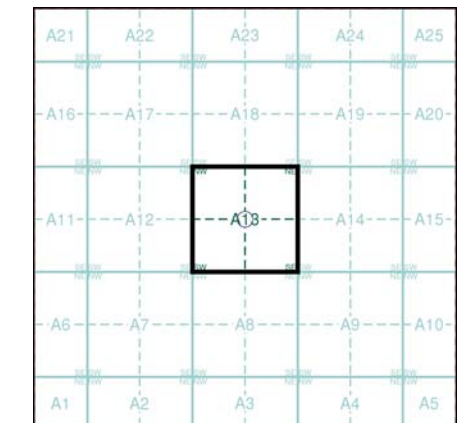
73-75 Avenue Road, LONDON, NW8 6JD



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 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
 - Several of Type at Location
- Agency and Hydrological**
- Contaminated Land Register Entry or Notice (Location)
 - Contaminated Land Register Entry or Notice
 - Discharge Consent
 - Enforcement or Prohibition Notice
 - Integrated Pollution Control
 - Integrated Pollution Prevention Control
 - Local Authority Integrated Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control Enforcement
 - Pollution Incident to Controlled Waters
 - Prosecution Relating to Authorised Processes
 - Prosecution Relating to Controlled Waters
 - Registered Radioactive Substance
 - River Network or Water Feature
 - River Quality Sampling Point
 - Substantiated Pollution Incident Register
 - Water Abstraction
 - Water Industry Act Referral
- Waste**
- BGS Recorded Landfill Site (Location)
 - BGS Recorded Landfill Site
 - EA Historic Landfill (Buffered Point)
 - EA Historic Landfill (Polygon)
 - Integrated Pollution Control Registered Waste Site
 - Licensed Waste Management Facility (Landfill Boundary)
 - Licensed Waste Management Facility (Location)
 - Local Authority Recorded Landfill Site (Location)
 - Local Authority Recorded Landfill Site
 - Registered Landfill Site
 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site
- Hazardous Substances**
- COMAH Site
 - Explosive Site
 - NIHHS Site
 - Planning Hazardous Substance Consent
 - Planning Hazardous Substance Enforcement
- Geological**
- BGS Recorded Mineral Site
- Industrial Land Use**
- Contemporary Trade Directory Entry
 - Fuel Station Entry

Site Sensitivity Map - Segment A13

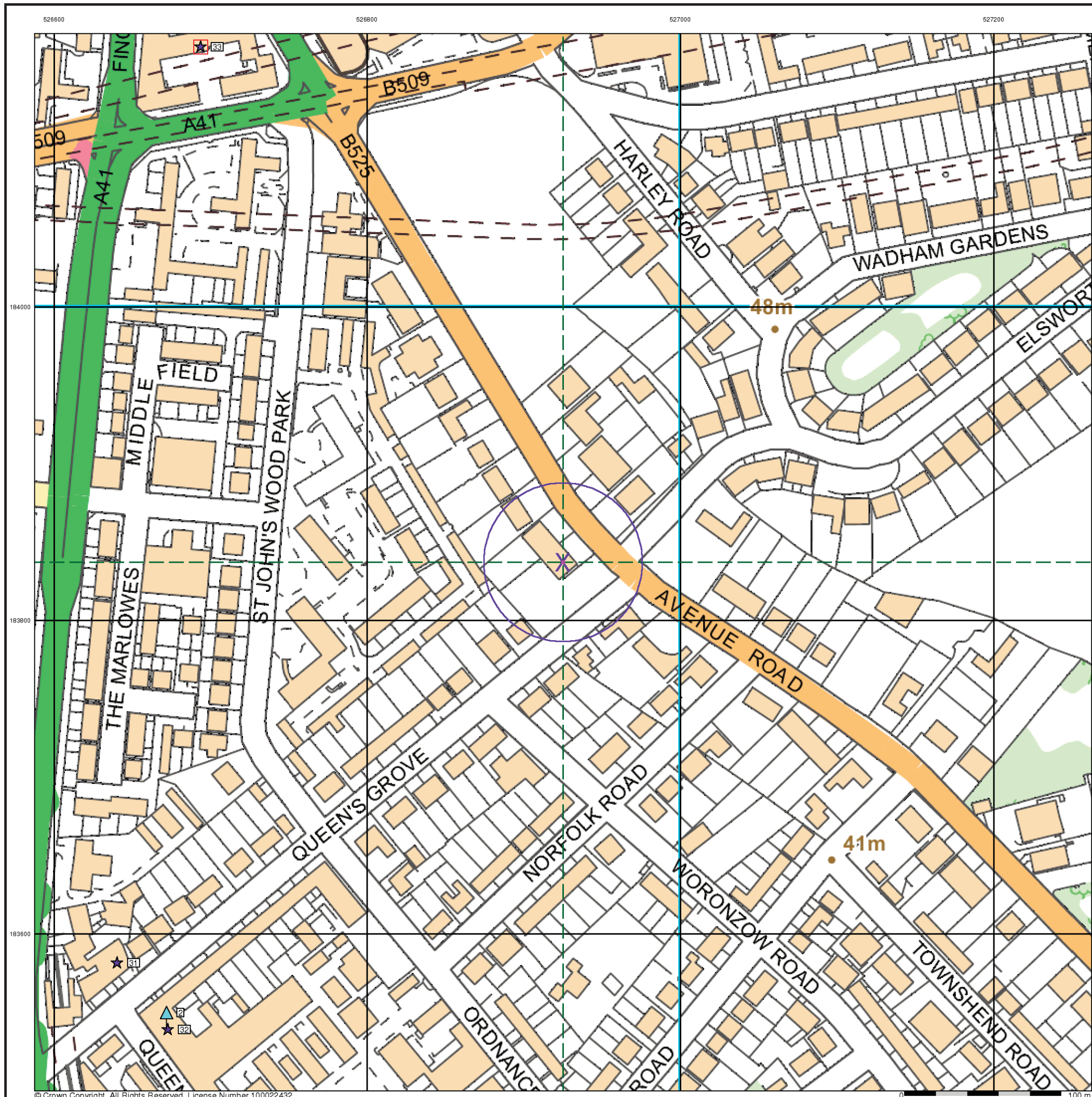


Order Details

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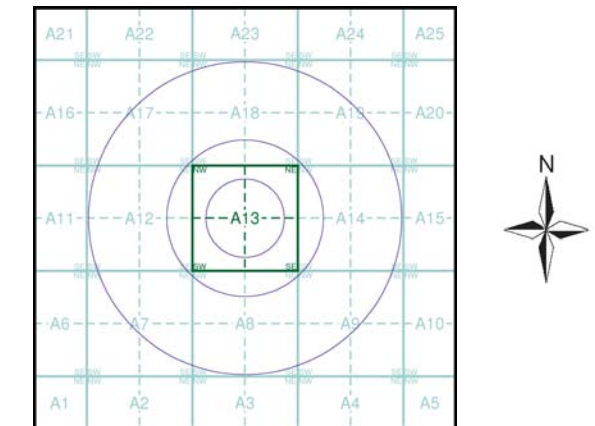
Site Details

73-75 Avenue Road, LONDON, NW8 6JD



- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
 - Several of Type at Location
- Agency and Hydrological**
- Contaminated Land Register Entry or Notice (Location)
 - Contaminated Land Register Entry or Notice
 - Discharge Consent
 - Enforcement or Prohibition Notice
 - Integrated Pollution Control
 - Integrated Pollution Prevention Control
 - Local Authority Integrated Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control Enforcement
 - Pollution Incident to Controlled Waters
 - Prosecution Relating to Authorised Processes
 - Prosecution Relating to Controlled Waters
 - Registered Radioactive Substance
 - River Network or Water Feature
 - River Quality Sampling Point
 - Substantiated Pollution Incident Register
 - Water Abstraction
 - Water Industry Act Referral
- Waste**
- BGS Recorded Landfill Site (Location)
 - BGS Recorded Landfill Site
 - EA Historic Landfill (Buffered Point)
 - EA Historic Landfill (Polygon)
 - Integrated Pollution Control Registered Waste Site
 - Licensed Waste Management Facility (Landfill Boundary)
 - Licensed Waste Management Facility (Location)
 - Local Authority Recorded Landfill Site (Location)
 - Local Authority Recorded Landfill Site
 - Registered Landfill Site
 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site
- Hazardous Substances**
- COMAH Site
 - Explosive Site
 - NIHHS Site
 - Planning Hazardous Substance Consent
 - Planning Hazardous Substance Enforcement
- Geological**
- BGS Recorded Mineral Site
- Industrial Land Use**
- Contemporary Trade Directory Entry
 - Fuel Station Entry

Site Sensitivity Map - Slice A

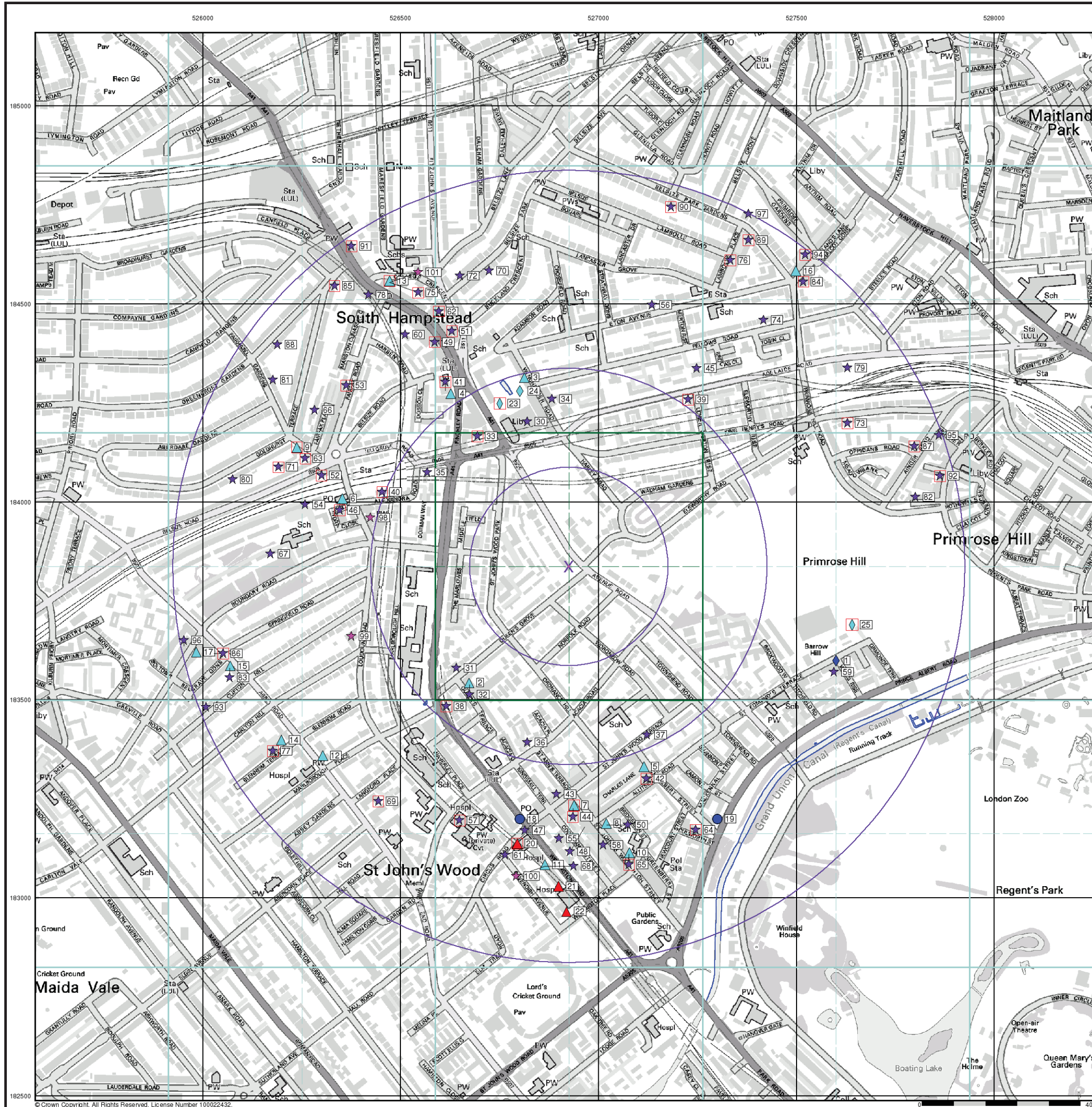


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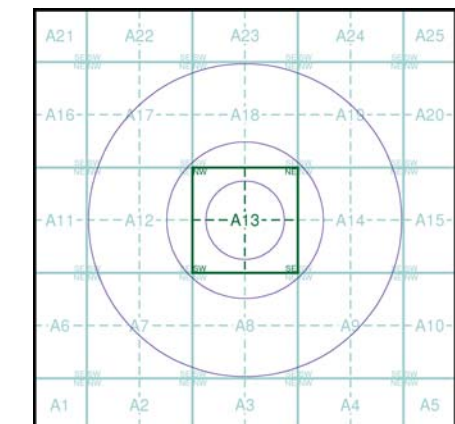
General

-  Specified Site
-  Specified Buffer(s)
-  Bearing Reference Point

Agency and Hydrological (Flood)

-  Extreme Flooding from Rivers or Sea without Defences (Zone 2)
-  Flooding from Rivers or Sea without Defences (Zone 3)
-  Area Benefiting from Flood Defence
-  Flood Water Storage Areas
-  Flood Defence

Flood Map - Slice A

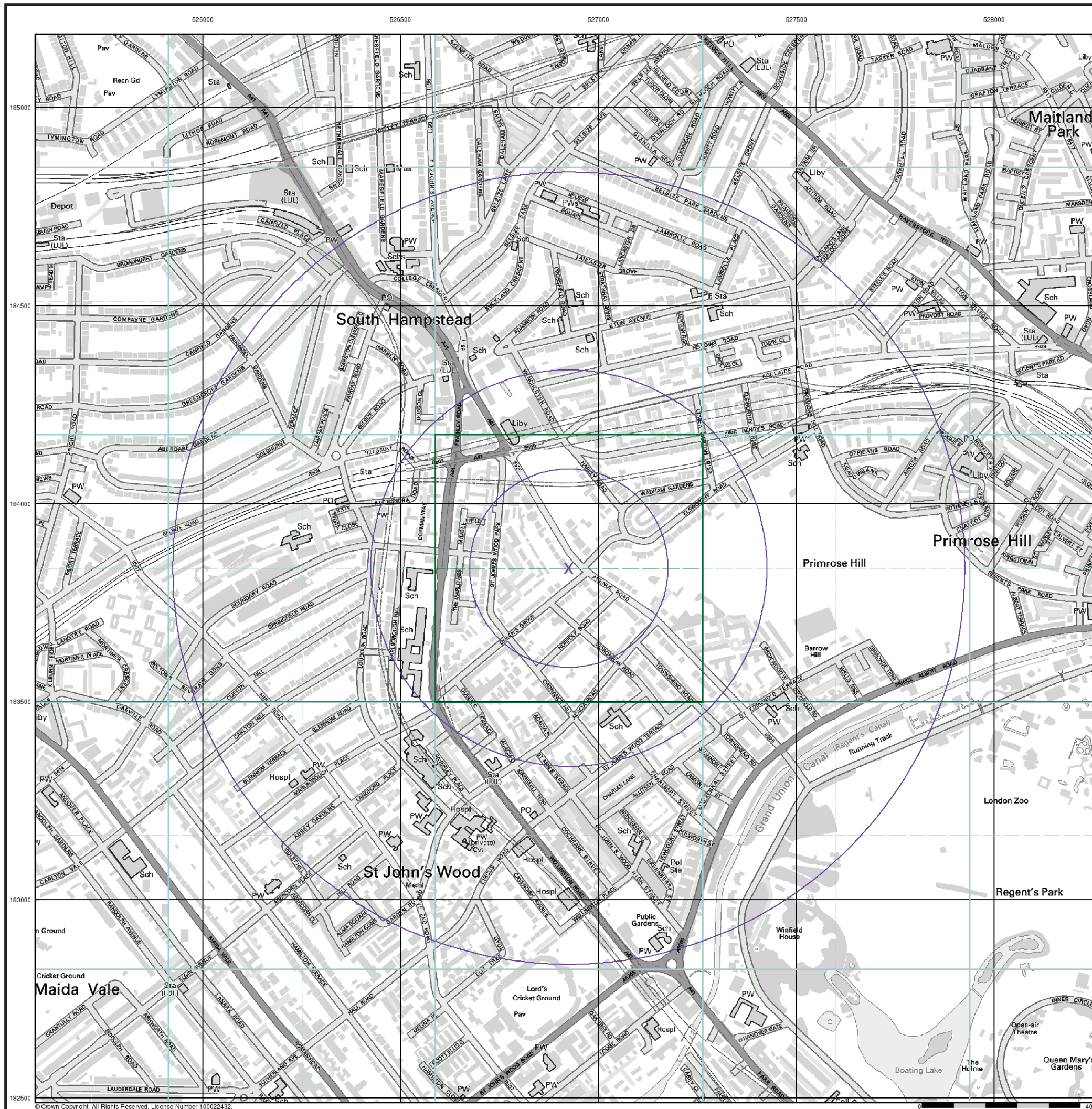


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